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IN THIS ISSUE

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Dr. Shannon Mortimore-Smith earned her PhD in English Education from Western Michigan University. She is currently an Associate Professor of English at Shippensburg University in Pennsylvania, where she teaches adolescent literature and secondary certification courses. Her research interests include multimodal, 21st-century, and New Media literacies, including the role of comics, graphic novels, Japanese manga, and video games in the English classroom. Her son and daughter attend Grace B. Luhrs University Elementary Laboratory School at Shippensburg University of Pennsylvania.

Ms. Tamara Smith-Moore is currently a faculty member at Shippensburg University where she is also the kindergarten teacher at Grace B. Luhrs University Elementary Laboratory School. In addition to advocating for the continued growth of the early childhood field, she has interests in the research area of gender and multicultural studies.

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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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Featured Articles:

LETTER FROM THE EDITORS

With many thanks to the IALS Executive Board and to our current president,

Wade Smith for his leadership, we are pleased to present this eleventh volume of the *International Association of Laboratory Schools Journal*. It is without question that the valuable work of laboratory schools across the world and in the association have continued to positively impact the lives and the education of our children. In this volume and in all that follow, we aspire to provide a home for the myriad voices that are represented within our laboratory schools and to celebrate our collaborative achievements with even wider audiences.

This volume represents the combined efforts of a broad spectrum of IALS members. Laboratory school teachers, university professors, and graduate students from across the globe have contributed their academic work to this volume, and by doing so, they have asked us to consider our own stake in the greater mission of our schools.

In the featured article, "The Role of Faculty Collaboration on Preservice Teachers' STEM Readiness," authors Argie Campbell, Chris James, Jeff Cornelius, Lisa Clayton, and Katie Kinney worked together to articulate the impacts of professional partnerships on preservice teachers. Identifying a need to support preservice teachers as future STEM educators, the research team completed a study to examine the effects of better preparation through practice and feedback on preservice teachers' conceptions and performance.

Similarly, writers Cline, Patet, Dimmitt, and Sparks uncovered interesting insights on the viewpoints of pre-service teachers. In their article, "Perceptions about Children, Childhood, and Teaching: Children's Literature as a Priming Event for Beginning Education Students," they conducted valuable research with implications on the outcome of using children's literature to assess and ultimately guide future interactions between educators and students. Deeply invested in the literacy practices of students as well, Timothy Grebeck's research investigates the impact of voice to text software on writing success in his article, "The Effects of Voice Recognition Dictation Software on Writing Quality in Third Grade Students: An Action Research." Grebeck's thoughtful conclusions provide teachers with another resource that could potentially assist struggling writers and encourage student growth in some populations.

Further, in their aptly timed article–published amid the devastating impact of a global pandemic on our education system–Haag, Martin, and Cummins from the Lab School Paris focus on the psychology of student well-being, quality of life in schools, and school climate in relation to student learning in their article, "Connecting Well-Being and Academic Learning: From Theory to Practice at the Lab School Paris." Similarly, in his article, "Reimagining the Curriculum: Preparing Students for the Future," Christopher Budano also firmly places his focus on how revisions to current curriculum and thoughtful collaboration between departments can improve future learning. Budano's examination of the "Model Core" supports "multiple opportunities...to develop the knowledge, skills, and understandings that will prepare [students] to lead in the future."

Enhancing the prosocial behavior of toddlers and focusing on how teachers can provide the caring and loving guidance that toddlers need to develop meaningful friendships is the work of contributors Zheng, Izumi-Taylor, and Turner in their pedagogically-focused article, "Are you my Friend? Toddlers' Development of Friendships," and likewise, Marcoux-Hunter, Na, and Simon's article, "A Laboratory School's Public Purpose: Transforming Education through Natural Curiosity," advocates for the physical and mental health benefits of outdoor education. With a goal of moving students and teachers from "surviving to thriving," their work in the Natural Curiosity environmental education program promotes transformative pedagogical approaches that integrate "inquiry, experiential learning and Indigenous perspectives" into the curriculum.

Finally, our volume concludes with a tribute to teacher Cindy Halewood, an early childhood elementary teacher whose "kindness, humor, knowledge, and caring," won the hearts of all she encountered. We were deeply moved by the remembrances shared, and we hope that you will join us in celebrating the life of this extraordinary laboratory school teacher.

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

Dedicated to research, leadership, and educational excellence,

Dr. Tamara Smith-Moore
Dr. Shannon Mortimore-Smith
2020-2021 Editors

LETTER FROM THE PRESIDENT

Dear IALS Community:

We have turned the page on 2020 and there are signs that we may be at the beginning of the end for the Covid pandemic. Vaccines are rolling out and initial plans for spring/summer vaccinations for children are in the works.

Covid has taken a huge toll. Friends and relatives have been taken from us and we have struggled to maintain some sense of normalcy while also reacting to the threat of the virus. Our schools have been subjected to massive shifts in instructional strategies and instructional delivery. As odd as it may seem, these changes may not be the biggest challenge faced by schools during these trying times.

Perhaps the biggest challenge is the ability to stay connected with students, so they maintain a sense of hope, belonging, and community. I have a school right down the road from my house. At the beginning of the pandemic, schools went entirely virtual from March until the end of the school year. Walking my dogs one day, I noticed about 20 cars and trucks in the student lot. As I got closer, the students had formed a circle where they could stay in their cars but still have some resemblance of a normal conversation.

The ability to bring folks together is just one of the things that make schools essential to the fabric of every country's culture. Like schools, IALS also brings people together; people from different backgrounds and cultures who all share a common cause of creating community and sharing ideas.

This year, for the first time, IALS will be hosting a virtual conference. The conference will take place July 7-9 and offers an opportunity for educators, pre-service educators, administrators, researchers, and faculty that are associated with or interested in laboratory schools to participate.

The conference will feature webinars, video forums, papers, posters, presentations, keynote speakers, online workshops, breakout sessions, and virtual visits to lab schools.

I encourage you to participate in the conference by presenting or simply by attending. The opportunities for professional conversations will serve to remind everyone of the critical role of laboratory schools in both normal and decidedly unusual times.

Wade Smith, PhD
President IALS

The Role of Faculty Collaboration on Preservice Teachers' STEM Readiness

Argie Campbell, Chris James, PhD, Jeff Cornelius, EdD, Lisa Clayton, EdD, Katie Kinney, PhD
UNIVERSITY OF NORTH ALABAMA

Introduction

The first decades of the 21st Century have seen Science, Technology, Engineering, and Mathematics (STEM) curriculum gain popularity in both K-12 schools and higher education (U.S. Department of Education, 2018). Whether in an elementary school with students creating simple circuits or in a high-school robotics class, STEM topics have become ubiquitous in the American education landscape. This rise in popularity—including a call by the President's Council of Advisors on Science and Technology to bolster the ranks of the field to 100,000 STEM teachers by 2020—has created a pronounced need for adequate preparation in teachers' content knowledge and pedagogy (Guzey & Radloff, 2016; Lynch, Peters-Burton & Ford, 2014). However, this popularity belies many teachers' comfort with STEM topics. Whether due to a lack of preparation while in colleges of education (Guzey & Radloff, 2016) or simply from teachers' lack of comfort teaching STEM-related topics (Nadelson, Callahan, Pyke, Hay, Dance, & Pfiester, 2013), teachers needed further preparation before STEM education can see its full benefit realized (Guzey & Radloff, 2016).

This study highlighted the best practices of Kilby Laboratory School to prepare preservice teachers for STEM instruction. More specifically, we explored the roles of faculty and preservice teachers in the development and implementation of a STEM thematic unit. The central question focused on collaboration among university faculty in promoting readiness: What was the role of faculty collaboration at a university laboratory school in preparing preservice teachers to teach STEM? In order to examine the central question, researchers focused on examining how the university faculty and laboratory school faculty collaborate in preparing preservice teachers to teach STEM and the experience of preservice teachers at the onset, throughout, and after teaching a STEM learning unit.

As more and more schools seek accreditation as STEM-certified programs, we see it demonstrated the necessity to prepare preservice teachers to teach STEM. Additionally, there is an increasing demand for STEM-skilled graduates to enter the workforce, reiterating the significance of teacher preparation in the STEM fields. With so many routes for preservice teachers to take in order to become certified educators, it is important to explore the best practices of a university laboratory school in preparing its preservice teachers to teach STEM.

For this study, the preservice teachers had no prior knowledge or experience teaching STEM in the elementary classroom setting. Additionally, it was assumed that only fourth grade standards would be used since the study was conducted in a fourth grade classroom. Consequently, this study was limited to one grade level. Another limitation of the study was the small sample size due to the number of students in the classroom, which limited the number of preservice teachers involved.

The preservice teachers in the study were selected because each of them had been formally admitted into the University of North Alabama's Teacher Education Program. To ensure that all participants met these criteria, the opportunity to participate in the study was only provided to elementary education majors in an elementary education mathematics course. Additionally, the only faculty members from the university to participate were the 4th grade classroom teacher at Kilby Laboratory School and the elementary mathematics education professor(s) from the University of North Alabama.

Review of the Literature | Overview

This literature review explores preservice teachers' conceptions of and readiness to teach STEM in the elementary setting. Additionally, this literature review addresses existing research on university and elementary school partnerships in preparing preservice teachers to teach STEM.

The National Science Foundation conceived of the idea of STEM in the late 1990s in the USA, primarily as a reaction to the nation's urge to dominate globally in the science, technology, engineering, and mathematics fields educationally, vocationally, and economically (Blackley & Howell, 2015). STEM has been lauded as a solution or barrier to potential economic decline, but these claims did not appear to be based on any actual research (Williams, 2011). Bellanca and Brandt (2011), however, illuminated STEM education's promotion of the 21st

century skills of collaboration, creativity, critical-thinking, and communication, especially for elementary students.

Consequently, STEM education was of particular importance to preservice teachers because of its impact on students' problem-solving skills (Rolling, 2011). STEM provided a unique opportunity for students to develop real life solutions to environmental problems, and Fattal (2017) argued that this conversion of "personal and academic understanding to a broader civil context" (p. 2) yielded the kind of global citizens the original proponents of STEM envisioned. University and school-based classroom experiences in STEM lesson planning and implementation could be a forerunner to collaborative investigations by elementary students that lead to civic action and confrontation of critical environmental issues (Rolling, 2011).

STEM has been introduced to preservice teachers through the planning and implementation of interdisciplinary lessons to address real world problems. By relying on pedagogies of design, inquiry, and problem solving, integrated STEM education was conceptualized as a form of constructivism (Blackley & Howell, 2015). Moore and Smith (2014) added to this work by identifying two ways to "integrate" STEM education, known as context integration and content integration. Context integration involves engineering design to teach math and science content, while content integration involves engineering learning objectives that parenthetically incorporate math and science content. Because the elementary education curriculum does not include engineering standards, context integration has been the most popular and successful STEM experience used in schools.

A closer look at previous literature reveals the past research on preservice teachers' experiences with STEM education. Preservice teachers have limited experience and vague conceptions of STEM instruction. First of all, Blackley and Howell (2015) pointed out that there are several obstacles to enacting STEM education, starting with the teaching of each subject in isolation ("S.T.E.M."), as opposed to an integrated unit ("STEM"). Next, engineering as its own content area was not part of any elementary education curriculum as it is now, nor was it a specialization for preservice teachers. Additionally, the word "technology" has ambiguous meanings across the education world. Because of this, preservice teachers have experienced a heavy emphasis on science and math with hardly any authentic integration of technology and engineering ("S.t.e.M"). Technology has been perceived as a ubiquitous word for anything from robotics and programming to machinery and computers. In this light, technology and engineering were seen as largely extracurricular foci ("s.T.E.m"). Lastly, preservice elementary teachers traditionally lacked competence and confidence in teaching both science and math in favor of literacy (Breiner, Johnson, Sheats-Harkness, & Koehler, 2012).

Two primary reasons for the fluid conception of STEM education were the curriculum design and skill level and/or teacher preparation. Science and math generally remained distinct content areas. "Integrated STEM education" (Sanders, 2009, p. 21) refered to teaching and learning in which two or more STEM subjects were involved or in which a STEM and non-STEM subject (i.e., art, civics) were involved; notably, this differed from the idea that all four STEM subjects needed to be taught together at once while simultaneously allowing for greater integration with other disciplines. Table 1 summarizes these important distinctions, with examples.

Radloff and Guzey's (2016) research on preservice STEM teacher conceptions of STEM education showed that many national teacher preparation programs need more effective STEM instruction in order for preservice teachers to even understand what is meant by the term "STEM."

Preservice teachers generally have limited experiences in teaching interdisciplinary curricula (Suriel, Spires, Radcliffe, Martin, & Paine, 2018). In their study of a university middle grades education department and local partner school districts, Suriel et al. (2018) reported findings from their newly constructed STEM Center. There, middles grades practicum students implemented day-long interdisciplinary lessons co-designed by faculty and teacher candidates. The project, known as STEMITL (Science Technology Engineering Mathematics Integrated Teaching and Learning STEMITL project), was developed to support preservice teachers in developing pedagogy, content knowledge, and confidence in regards to teaching STEM. The Southeastern University where the project was designed and implemented has a Professional Development School partnership with local schools and uses a clinical-based educator preparation model. Preservice teachers there reported that overall this was a positive learning experience for two key reasons: the importance of ownership in preparing and providing instruction, and an appreciation for engaging in a team-teaching experience with colleagues. This also provided for effective classroom management practice.

Similar to the implications of the STEMITL project and building on their own previous research, Blackley and Howell (2019) noted that at the national level, the focus on how best to prepare teachers had included greater emphasis on clinical preparation. As stated by Walker, Moore, Guzey, and Sorge (2018), there was a need for documentation of STEM thematic units that have been taught, from the planning stages to the implementation with detailed scaffolds**.** In Australia, for example, preservice teachers have to nominate a specialization in their degree, and STEM is gaining popularity as a new specialization (Blackley & Howell, 2019).

Lastly, recent research conducted by Ferguson and Sutphin (2019) studied preservice teachers' STEM readiness to teach both before and after their first STEM lesson. The researchers

pointed out the need to start preservice teachers on the process of both personal and professional identity reflection early in their teacher preparation program. Preservice teachers needed to begin the process of reflecting on effective personal and professional traits of teachers early in their teacher preparation program, guided by teacher educators and focused on integrated education (Friesen & Besley, 2013).

Collaboration and STEM Education

Suriel et al. (2018) and her colleagues at the newly constructed STEAM Center of their university reported that preservice teachers noted the connection between the university and school system along with the value of a university-school partnership. For obvious reasons, STEM instruction was a collaborative approach to both curriculum and pedagogy involving teachers in multiple grades and content areas (Fattal, 2017), along with a number of other educational stakeholders. National organizations like the AACTE and the Council for Accreditation of Educator Preparation (CAEP) (formerly known as NCATE) have been calling for increased school-university partnerships as the keystone for high quality teacher education (AACTE, 2010; NCATE, 2010).

The university and laboratory school partnership is one such example of a highly effective school-university partnership for quality teacher preparation. A laboratory school's purpose is to connect theories of education, observation, and training (Jaggers, 1946). Clayton, Cornelius, James, and Kinney (2019) analyzed important characteristics of one university and laboratory school partnership, and three key pedagogical patterns emerged among cultural attitudes, mindsets, and language. First, all stakeholders maintained high expectations for teaching and learning. Clayton et al. (2019) also referred to "duality of mission and administrative support" (p. 9) to describe this first key theme common to university and laboratory school partnerships. Teachers at the laboratory school have a double-sided role as classroom teacher as well as faculty member of the university that supports preservice teachers. Laboratory schools traditionally maintain a high caliber of teaching and learning along with quality clinical experiences, coaching, and mentoring for preservice teachers. Additionally, it was impactful for the university administration to support the laboratory school in fulfilling its double-sided mission.

Second among the findings from the study was collaboration between the university and laboratory school. The collaborative environment was due in large part to the physical proximity, as the laboratory school is located on the university's campus. Preservice teachers and university partners regularly engaged in teaching, research, and service with the faculty and students at the laboratory school. Collaboration between the laboratory school and the university allowed for focused preparation and development of projects, research, expertise, and talents.

The third key characteristic to describe highly effective university and laboratory school partnerships was the presence of authentic teaching and learning experiences: real-life instruction and constructive feedback—for both preservice and in-service teachers. Laboratory school teachers modeled a growth mindset by being willing to accept and observe new teaching strategies that take place in the laboratory school clinicals based on the theories and pedagogy that preservice teachers are learning from university faculty (Clayton et al., 2019). Given these three pedagogical themes, it was no wonder the university and laboratory school partnership was such an effective tool for teacher education.

There is ample literature from previous studies on the significant impact of teaching integrated STEM education to elementary students. Additionally, research showed the overwhelming misconceptions, lack of experience, and lack of confidence that preservice teachers face in regards to teaching STEM. Given the highly successful potential of university and laboratory school partnerships, this study seeks to highlight the best practices of Kilby Laboratory School to prepare preservice teachers to teach STEM.

Research Design and Setting

This qualitative study was an ethnographic case study. Data were collected through structured interviews, observations of clinical planning and collaboration meetings, and classroom conversations. The participants were asked questions with a central focus on the role of faculty collaboration at a university laboratory school in preparing preservice teachers to develop and teach STEM thematic units. The researchers conducted structured interviews with the laboratory school classroom teacher to address the questions regarding roles and collaboration. The researchers also conducted structured interviews with the elementary education faculty involved to address similar questions. Additionally, the researchers conducted structured interviews with the preservice teachers majoring in elementary education to address their conceptions of and readiness to teach a STEM thematic unit before, during, and after their education course.

Data were also collected from observations of clinical planning and collaboration meetings and classroom observations with a central focus on the role of faculty collaboration at a university laboratory school in preparing preservice teachers to develop and teach STEM thematic units.

The laboratory school was a public elementary school

consisting of grades kindergarten through sixth grade with a student population of approximately 180 students. This study specifically utilized a fourth grade classroom at the laboratory school during the course of the regular school day in collaboration with the university's mathematics for elementary education course. There were 18 fourth grade participants in the laboratory school classroom and 20 participants in the elementary education mathematics course. Both the laboratory school and the university share similar characteristics regarding socioeconomic status and race: predominantly white and middle class. Institutional Review Board (IRB) approval was obtained for the study through the University of North Alabama. Oral assent was obtained from fourth students as well as parental consent of the fourth grade students to participate in the study. In addition, preservice teachers were recruited via email to participate in the study. Protocol templates for structured interviews and observations may be found in Appendix A, Appendix B, and Appendix C.

Procedures

Before the semester started, the laboratory school fourth grade classroom teacher and elementary education faculty member communicated about the STEM objectives and standards that the elementary students needed to cover in an initial planning meeting. These plans were recorded by filling out the clinical planning and collaboration meeting observation template. All subsequent clinical planning meetings were also recorded in this fashion.

After this initial planning meeting, the professor divided the preservice teachers into groups of 3. Each group decided upon a STEM topic related to the fourth grade science standards for the given unit, and the groups planned a lesson to be taught before the midpoint of the semester. The lessons were submitted to the professor and shared with the classroom teacher. Lesson topics addressed a variety of relevant campus and community needs. They ranged from proposals to repair the university's iconic fountain based on pore space research to effective engineering solutions for retaining flood waters surrounding a nearby dam. The fourth grade students rotated among the preservice teaching groups to have each lesson one time. Each preservice teaching group taught their lesson for two rotations lasting fifteen minutes each; they repeated this schedule twice in order to teach all four small groups of fourth grade students over a period of two weeks. While half of the preservice teachers taught their lessons during a class period, the remaining preservice teachers observed the STEM lessons. At the end of every session's teaching experience, the professor and fourth grade teacher facilitated a whole-class reflection with the preservice teachers to identify strengths and areas for improvement. Additionally, the professor and fourth grade teacher provided specific oral feedback to teaching groups.

Researchers conducted structured interviews with preservice education teachers at the start of the semester prior to any clinical teaching related to the elementary education course to gauge their conceptions of and readiness to teach STEM. The same structured interviews were conducted midway through the semester after the preservice teachers had planned and taught at least one STEM lesson and again at the closing of the semester after all clinical teaching experiences had occurred. Classroom observations were recorded throughout the semester in both the laboratory school classroom and elementary education course setting.

Lastly, researchers conducted structured interviews with both the laboratory school classroom teacher as well as the elementary education faculty member involved in the collaboration at the end of the semester to reflect upon the roles and best practices highlighted in the study.

Data Collection

Qualitative data collected from interviews and observations of preservice teachers before, during, and after teaching a STEM thematic unit were utilized. Additionally, anecdotal and observation notes were maintained from collaborative meetings between the university elementary education professor and the university laboratory school fourth grade teacher. The combination of these data sources provided a comprehensive view of the best practices employed at a university laboratory school in preparing preservice teachers to teach STEM.

In order to gain the most thorough record of best practices employed by the university's education department and laboratory school in preparing preservice teachers for STEM instruction, qualitative data were collected in this ethnographic case study. Qualitative data were collected in the form of structured interviews and observation notes. Both the university professor and the university laboratory school teacher were interviewed at the start of the study to provide insight into the collaborative nature of the two entities. All planning meetings between the university professor and laboratory school teacher were observed and recorded as well as any clinical planning meetings among the professor, teacher, and preservice teachers. Structured interviews were also conducted with each of the twenty-two preservice teachers enrolled in the elementary education mathematics instruction course at the onset, midpoint, and conclusion of the study.

The structured interview responses from preservice teachers at the onset of the study were transcribed and coded for common themes and frequently repeated words and phrases as listed in Table 4.1.

Table 4.1
Preservice Teachers' Experience with STEM (at the onset of the study)

Common Themes	Example Quotations
Lack of experience	"very little experience" "not much experience teaching or learning STEM"
Confusion and vagueness	"I don't really know what it's about" "involves science and somehow engineering" "involves technology" "I think it is mostly hands-on learning" "STEM lessons take a lot of time
Basic identification	Can identify the subjects denoted by the letters in the acronym STEM
High level of importance	"involves critical thinking and learning how to work both independently and as part of a team" "…DO know it is important" "STEM education promotes hands on learning, teamwork, collaboration, and critical thinking"

At the midpoint of the study, the preservice teachers had taught part of their lessons, and their most commonly reported experience with teaching STEM revolved around classroom management, including managing students working in small groups and managing the logistics of their lessons. While debriefing with the preservice teachers after teaching their lessons, the preservice teachers reported that their experience would have been even better if they had managed their time better and were more prepared with "practical management strategies" for classroom management. As far as experience with STEM itself, the preservice teachers unanimously reported excitement over the content they taught, the consequent engagement of the fourth grade students in the lessons, and the real-time feedback from faculty (the observing university professor and laboratory school teacher).

The structured interview responses from preservice teachers at the conclusion of the study were transcribed and coded for common themes and frequently repeated words and phrases as listed in Table 4.2.

Table 4.2
Preservice Teachers' Experience with STEM (at the conclusion of the study)

Common Themes	Example Quotations
Knowledge of STEM	"It is a hands-on approach to integrate multiple subjects." "It is beneficial for them [the elementary students] to make mistakes and re-evaluate and make another plan" "STEM is integrated teaching. STEM is about connecting more than one topic/school subject to one lesson and being able to engage and further the child's education about multiple things and ways at one time." "It [STEM] really illustrates how all subjects are important because they strengthen one another. I also know students seem to really enjoy STEM time because they are working with the lesson hands-on which provides more engagement."

Common Themes	Example Quotations
Role of the teacher	Facilitator of learning experiences
	"To bring the child a more engaging lesson with more learning opportunities while also developing their problem-solving and critical thinking skills"
	"The teacher needs to be able to encourage students to go down and explore any and all ideas even if they are wrong."
	"allow the experience to be inquiry-based"
	"The teacher should get the materials together, plan the lesson, explain it to the students, and then let them go to explore and learn. The teacher should ask thought provoking questions and facilitate the students' learning."
	"When a teacher develops a STEM unit it promotes the students' learning by letting them learn information in a new way. Instead of standing in front of the class teaching a lesson about dams, develop a STEM unit where the students experience it hands-on. STEM units allowing the lesson to be more engaging to the students."
	"thoroughly plan a STEM lesson and ensure that they bring every material necessary for the lesson. They must also have a clean plan in mind as well as back up plans for their back up plans. During the lesson, teachers should be facilitators of learning."
Self-efficacy	"STEM is now something that I'm so excited to get into the classroom and start teaching"
	"I was very confused on what STEM was until I was able to teach a lesson using it."
	"This has allowed me to be more comfortable with teaching STEM lessons, and it has also allowed me to see it in action. This project has been very beneficial to me and is something that I will remember as I become a teacher and practice these same lessons in my own classroom. Many new educators come into the classroom not knowing about STEM or being afraid of it, but I will be able to embrace it and teach it daily."
	"This was beneficial in my development of being a teacher. One of the most relatable tasks that I can take with me once I am a teacher."
	"This will be a part of preservice teaching that I will never forget. It was by far one of the most beneficial things that I have done within the College of Education."
	"To see and watch the kids create and learn and try different things and tactics was something that is almost indescribable."

Data Analysis

Analysis of the professor's and laboratory school teacher's interview transcripts reveal common themes and perspectives shared by both the university elementary education department and the university elementary laboratory school. Both educators view their role as faculty members as an extension and support of the other: "Teachers here at the laboratory school adhere to the school's mission of teaching both our elementary students as well as preservice teachers," said the classroom teacher. Similarly, the university elementary education professor described her role as being "a university professor with the advantage of a clinical classroom setting" in which her students as preservice teachers can practice and observe quality teaching. Additionally, both educators identified the university/laboratory school relationship as unique in its shared culture: the professor stated,

> As professors, we know that we can reach out to the classroom teachers at our laboratory school in order to arrange clinical teaching experiences, whole-class and individual observations, and even opportunities for co-teaching and research. Likewise, the classroom teachers reach out to us for opportunities to enrich and supplement instruction with collaboration from our elementary education classes. There is a familiarity and easiness combined with a desire to explore and establish innovative best practices. I don't believe that can happen when a university/school partnership is not of the same institution.

Table 4.3
Analysis of Preservice Teachers' Experience with STEM

Before the study	Midpoint of the study	Conclusion of the study
Lack of experience with teaching and/or learning STEM	Excited by the teaching and learning experiences	Working knowledge of STEM as a content area as well as STEM instruction
Possessed basic knowledge of STEM (could identify the acronym)	Pleased to experience high levels of student engagement in their STEM lessons	Clear view of the role of the teacher as facilitator in discovery
Confused about STEM	Challenged by classroom management and time management	High levels of self-efficacy to teach STEM
Acknowledged the importance of STEM education	Eager to keep trying to improve STEM instruction and classroom/time management	

The participating preservice teachers also noted the committed relationship between the university and laboratory school by explaining that students in the teacher education program can go to the laboratory school any time so they can "observe and learn how to become the best teacher they can be" and "see real life classrooms, instruction, and situations all of the time." One preservice teacher even commented that the lab school was the reason why she decided to attend the particular university and furthered her desire to be a teacher.

By comparing Tables 4.1 and 4.2 along with the midpoint structured interviews, the following illustration emerged as an analysis of the preservice teachers' experiences with STEM instruction before, during, and after the study:

The information in Table 4.3 presents the idea that preservice teachers greatly benefitted from a STEM clinical teaching experience in a laboratory school classroom, especially in the areas of STEM understanding and STEM lesson implementation and instruction.

Guiding Question Findings

The purpose of this case study was to address the central research question: What is the role of faculty collaboration at a university laboratory school in preparing preservice teachers to teach STEM? The guiding questions were addressed in order to answer the central research question. A discussion of the guiding questions in relation to collected data follows.

Guiding Question 1

How did university faculty and laboratory school faculty collaborate in preparing preservice teachers to teach STEM? Based on the observations and structured interview responses from the university elementary education professor, fourth grade laboratory school teacher, and preservice teachers, university and laboratory school faculty collaborated to prepare preservice teachers to teach STEM in two overarching ways: through existing shared culture and through explicit, on-going support of the preservice teachers' STEM lessons.

The existing shared culture created and maintained by faculty at both the university as well as the laboratory school provides an essential context for preservice teacher success. This culture provides for a hospitable and supportive clinical setting for preservice teachers to observe and implement instruction. Furthermore, both the university professor and the laboratory school teacher encouraged the preservice teachers to make use of the laboratory school in preparing for their STEM lessons by visiting beforehand to set up, gather materials, and prepare with the laboratory school teacher; this kind of added availability is commonplace at the laboratory school due to the existing shared culture. This study strengthened the bond between the university elementary education department and the laboratory school because of the collaborative roles of both faculty members.

Before Teaching the Lessons

University and laboratory school faculty collaborated through explicit, on-going support of the preservice teachers' STEM lessons. By meeting initially to determine the scope and sequence of what each entity—the fourth grade students as well as the preservice teachers—would need to learn, the university professor and laboratory school teacher had a clear understanding of expected outcomes. The professor expected her preservice teachers to gain familiarity and confidence with STEM instruction, and the lab school teacher expected

her elementary students to develop a deep understanding of learning concepts from her science and mathematics curricula.

The two educators determined that they would plan to co-teach an exemplar STEM lesson for the observing preservice teachers, integrating some of the fourth grade science and math standards—which also integrated concepts from social studies standards; the lesson incorporated the engineering and design process, as well. They met to plan the lesson, and they also debriefed with the preservice teachers after the lesson was implemented. This approach provided a scaffold for the preservice teachers as they began to form a conception of STEM instruction. Their takeaway from anecdotal notes was how integrated the subject matter was in the lesson and, consequently, how engaged the elementary students were because of the interrelated nature of the content. **Additionally, this was the first time the preservice teachers realized how much of a facilitator the teacher is in a STEM lesson. They acknowledged that this type of teaching takes a unique approach to planning and is especially conducive to educator collaboration.**

Before the preservice teachers began planning their own lessons, the laboratory school teacher attended one of their elementary education mathematics instruction class periods for a planning session. There, the professor and laboratory school teacher provided standards and class formatting (i.e., how the fourth grade students would be grouped, how many student groups would each small group of preservice teachers instruct in a class period, how long each small group lesson would last, and how long each class period would last). The laboratory school teacher provided her own contact information for any follow-up questions as the preservice teachers planned their lessons, and many of the preservice teachers communicated in person or via email for planning and logistical feedback.

During and Immediately Following the Lessons

While the preservice teachers implemented their STEM lessons to small groups of fourth grade students, the university professor and laboratory school teacher circulated to observe and minimally interject. For instance, as one small group of preservice teachers tasked their students with building a retaining wall for a model stream bed with rocks, the laboratory school teacher posed a question to the group of students to model for the teachers: "How can you describe your retaining wall design as a array?" This mathematics question, directly related to the science objective and involving engineering, prompted students to look at what they built and apply mathematical understanding. This was an in-the-moment but intentional check for understanding to formatively assess student understanding. Preservice teachers picked up on this modeling and continued the conversation with more mathematical reasoning than before.

During these lessons as the faculty members observed and occasionally interjected, the preservice teachers would step aside periodically to ask a question or seek guidance. This provided many opportunities for real-time feedback that supported their instruction as well as management.

Immediately following each class period, the professor and teacher debriefed the lessons with the preservice teachers, specifically asking, "What went well?" and, "Even better if?" Overwhelmingly, the preservice teachers expressed gratitude for the experience because they felt confident after teaching lessons that engaged and appropriately challenged the students; moreover, they acknowledged the support of both faculty members, and they expressed excitement about teaching STEM. The ongoing support and collaboration of the faculty members was especially pivotal at this point in the study as the preservice teachers began to build their self-efficacy and knowledge of STEM instruction.

After All Lessons Were Taught

After all of the clinical STEM teaching experiences were completed, one of the preservice teaching groups asked permission to meet once again with the fourth grade students. These teachers felt comfortable enough with the faculty members and laboratory school setting to ask to extend their unit by one class period, and because of the collaborative roles of the faculty members, these teachers were given the opportunity to complete their extended unit. This speaks to the level of support and collaboration exhibited by the faculty members as well as the growth in STEM understanding and instruction of the group of preservice teachers.

Guiding Question 2

What was the experience of preservice teachers at the onset, throughout, and after teaching a STEM learning unit? As evidenced by the information in Table 4.3, the preservice teachers' experiences from the beginning to the end of the study underwent a sweeping change. Before any support had been provided, preservice teachers were largely confused about STEM instruction. Once the teachers began implementing their lessons—after ample support from both faculty members—they experienced moments of understanding and confidence. By the conclusion of the study, all preservice teachers remarked on the benefit of the STEM clinical teaching experience with such support from both faculty members. With the collaborative roles of the faculty members, the preservice teachers went

from having little experience or clear knowledge about STEM or STEM instruction to feeling empowered and excited by their own implemented STEM lessons.

The purpose of this study was to examine the role of faculty collaboration at a university laboratory school in preparing preservice teachers to teach STEM. Overall, the role of faculty collaboration at university laboratory school in preparing preservice teachers to teach STEM was two-fold: to provide opportunities for teaching STEM and to support the planning and implementation of the STEM lessons. This study's findings aligned with current literature in a number of ways, but it especially furthered the conclusions of Clayton et al. (2019) regarding effective university and laboratory school partnerships.

Summary and Recommendations

How did university faculty and laboratory school faculty collaborate in preparing preservice teachers to teach STEM? Regarding the first guiding question for this research, the university and laboratory school faculty members collaborated to prepare preservice teachers to teach STEM starting well before the designated semester, continued collaboration throughout the duration of the clinical teaching experiences, and reflected regularly approaching the conclusion of the study. The participating university and laboratory school partnership is one example of a highly effective school-university partnership for quality teacher preparation as identified in Clayton et al.'s 2019 research. This is the kind of collaboration for which national teacher education preparation organizations like the AACTE (American Association of Colleges for Teacher Education) and the Council for Accreditation of Educator Preparation (CAEP), formerly National Council on the Accreditation of Teacher Education, have been advocating (AACTE, 2010; NCATE, 2010).

What was the experience of preservice teachers at the onset and the conclusion of the study after teaching a STEM learning unit? Preservice teachers participating in this study experienced a drastic difference in their understanding of and self-efficacy with STEM instruction from the onset to the conclusion of the study. This fits in line with current literature that reveals limited experience and vague conceptions of STEM education before encountering an opportunity to prepare for STEM instruction (Blackley & Howell, 2015; Breiner, Johnson, Sheats-Harkness, & Koehler, 2012; Radloff & Guzey, 2016; Suriel, Spires, Radcliffe, Martin, & Paine, 2018; Ferguson & Sutphin, 2019). A key difference that this study poses, however, is the overwhelming call made by the participating preservice teachers for this university-laboratory school clinical collaboration to continue every semester.

While many teacher preparation programs still do not offer courses to specifically prepare preservice teachers for STEM instruction, this study highlights one creative approach to immersing educators into STEM instruction preparation. Any course intended to prepare teachers in a single content area of STEM can include an experiential teaching component dedicated to integration of the subjects, as was the case with this study. Furthermore, even experienced teachers can learn from this study the value of collaborating with community members or teacher preparation programs; these partnerships would offer an opportunity for professional development to enhance STEM knowledge and best practices. Lastly, with such effective outcomes as this study, it is imperative that educators advocate for funding in order to develop STEM programs for elementary students everywhere.

References

American Association of Colleges of Teacher Education (2010). *The clinical preparation of teachers: A policy brief.* Washington, D.C.: AACTE. Retrieved from http://edwebsfiles.ed.uiuc.edu/transitions/AACTE-Policy-Brief-March-2010.pdf.

Bellanca, J.A., & Brandt, R.S. (2011). 21st century skills: Rethinking how students learn. *Teacher Librarian, 39*(1), 38. Retrieved from https://ezproxy.una.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&AuthType=cookie,ip&db=edsbro&AN=edsbro.A272444209&site=eds-live&scope=site.

Blackley, S., & Howell, J. (2015). A STEM narrative: 15 years in the making. *Australian Journal of Teacher Education, 40*(7), 33-47. http://dx.doi.org/10.14221/ajte.2015v40n7.8.

Blackley, S., & Howell, J. (2019). The next chapter in the STEM education narrative: Using robotics to support programming and coding. *Australian Journal of Teacher Education, 44*(4), 51-64. Retrieved from https://ro.ecu.edu.au/ajte/vol44/iss4/4.

Breiner, J. M., Johnson, C. C., Sheats-Harkness, S., & Koehler, C. M. (2012). What is STEM? A discussion about conceptions of STEM in education and partnerships. *School Science and Mathematics, 112*(1), 3-11. Retrieved from http://dx.doi.org/10.1111/j.1949- 8594.2011.00109.x.

Clayton, L., Cornelius, J., James, C., & Kinney, K. (2019). University and laboratory school partnerships. *International Association of Laboratory Schools Journal, 9*(1), 7-12. Retrieved from https://www.laboratoryschools.org/attachments/article/99/IALS_Spring19_FINAL.pdf.

Fattal, L.R. (2017). Intro the woods: Environmental problem solving through STEAM lesson planning. *The STEAM Journal, 3*(1), 13-39. doi:10.5642/steam.20170301.08

Ferguson, S., & Sutphin, L. (2019). Pre-service STEM teachers' view of teaching before and after their first lesson. *International Journal for the Scholarship of Teaching and Learning, 13*(2), 48-65. Retrieved from https://doi.org/10.20429/ijsotl.2019.130214.

Friesen, M.D., & Besley, S.C. (2013). Teacher identity development in the first year of teacher education: A developmental and social psychological perspective. *Teaching and Teacher Education, 36,* 23-32. Doi: 10.1016/j.tate.2013.06.005

Guzey, S. & Radloff, J. (2016). Investigating preservice STEM teacher conceptions of STEM education. *Journal of Science Education and Technology, 25,* 759-774. https://doi.org/10.1007/s10956-016-9633-5.

Jaggers, C.H. (1946). The function of the laboratory school. *Peabody Journal of Education, 23*(5), 276-279. Retrieved from https://www-jstor-org.ezproxy.una.edu/stable/1489680

Lynch, S.J., Peters-Burton, E.E., & Ford, M.R. (2014). Building STEM opportunities for all. *Educational Leadership, 72*(4), 54-60. Retrieved from http://www.ascd.org/publications/educational-leadership/dec14/vol72/num04/Building-STEM-Opportunities-for-All.aspx.

Moore, T. J., & Smith, K. A. (2014). Advancing the state of the art of STEM Integration. *Journal of STEM Education, 15*(1), 5-10. Retrieved from http://search.ebscohost.com.ezproxy.una.edu/login.aspx?direct=true&AuthType=cookie,ip&db=a9h&AN=96381833&site=eds-live&scope=site

Nadelson, L.S., Callahan, J., Pyke, P., Hay, A., Dance, M., & Pfiester, J. (2013). Teacher STEM perception and preparation: Inquiry-based STEM professional development for elementary teachers. *Journal of Educational Research, 106*(2), 157-168. Retrieved from http://dx.doi.org.ezproxy.una.edu/10.1080/00220671.2012.667014.

National Council for Accreditation of Teacher Education. (2010, November). *Transforming teacher education through clinical practice: A national strategy to prepare effective teachers*. Washington, DC: Blue Ribbon Panel on Clinical Preparation and Partnerships for Improved Student Learning.

Rolling Jr., J. H. (2016). STEAM locomotion. *Art Education, 69*(6), 4-5. doi: 10.1080/00043125.2016.1224811.

Suriel, R.L., Spires, R.W., Radcliffe, B.J., Martin, E.P., Paine, D.G. (2018). Middle school to professional development: Interdisciplinary STEM for multiple stakeholders. *School-University Partnerships: The Journal of the National Association for Professional Development Schools, 11*(1), 57-59. https://eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=EJ1179970

U.S. Department of Education. (2018). Science, Technology, Engineering, and Math. Retrieved from https://www.ed.gov/stem.

Walker, W.S., Moore, T.J., Guzey, S.S., & Sorge, B.H. (2018). Frameworks to develop integrated STEM curricula. *K-12 STEM Education, 4*(2), 331-339. doi: 10.14456/k12stemed.2018.14

Williams, J. (2011). STEM Education: Proceed with caution. *Design and Technology Education, 16*(1), 26-35. https://eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=EJ916494

Appendices

APPENDIX A: University of North Alabama STRUCTURED INTERVIEWS

Kilby Faculty Member

- How would you describe your role at the laboratory school?
- How would you describe your role in the development of the STEM unit?
- How would you describe the role of the elementary education faculty in the development of the STEM unit?
- How would you describe the role of the preservice teacher in the development of the STEM unit?
- What goals were you hoping to obtain during the development and implementation of the unit?
- Were those goals met?
- If you complete a project similar to this one in the future, would you change anything? If so, explain.
- Please share any other thoughts you would like to share related to the process of developing the STEM unit.

Elementary Education Faculty

- How would you describe your role at the university/laboratory school?
- How would you describe your role in the development of the STEM unit?
- How would you describe the role of the Kilby faculty member in the development of the STEM unit?
- How would you describe the role of the preservice teacher in the development of the STEM unit?
- What goals were you hoping to obtain during the development and implementation of the unit?
- Were those goals met?
- If you complete a project similar to this one in the future, would you change anything? If so, explain.
- Please share any other thoughts you would like to share related to the process of developing the STEM unit.

Preservice Teachers majoring in Elementary Education (Interview at the beginning of the project)

- What do you know about Kilby Laboratory School?
- What experience do you have with Kilby Laboratory School?
- What do you know about STEM education?
- What do you expect to learn about developing a STEM unit?

Preservice Teachers majoring in Elementary Education (Interview at the midpoint of the project)

- What do you know about STEM education?
- What is the role of the teacher in developing STEM units?
- Can you describe your experience with this project?
- Has this process been beneficial? If so, how and to whom?

Preservice Teachers majoring in Elementary Education (Interview at the conclusion of the project)

- What do you know about STEM education?
- What is the role of the teacher in developing STEM units?
- Can you describe your experience with this project?
- Has this process been beneficial? If so, how and to whom?
- If this project were to be repeated with another group of preservice teachers, what would you change?
- Do you have any other comments or thoughts you would like to add?

APPENDIX B: University of North Alabama Observation of Clinical Planning and Collaboration Meeting

Location:

Date:

Observation Data:

APPENDIX C: University of North Alabama STEM Implementation Observations

This form will be used to gather classroom observation notes during the implementation of the STEM unit.

Location:

Date:

Observation Data:

Author's Biographies

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Chris James, Ph.D. is currently completing his twenty-fifth year in education. During his career, he has served as a secondary mathematics teacher, assistant principal, principal and director of Kilby Laboratory School. Presently, he serves as the Director of Teacher Education and teaches graduate level coursework in the Instructional Leadership and Teacher Leader programs at the University of North Alabama.

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Perceptions about Children, Childhood, and Teaching: Children's Literature as a Priming Event for Beginning Education Students

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What is childhood? What is the value of examining perceptions of childhood? How do perceptions of children and childhood impact teachers' interactions with children? These are important questions for teachers and teacher educators. Teachers working with laboratory schools, which are commonly recognized as embracing progressive views about children and for pioneering developments in the "science and art of teaching," (IALS, para. 2) may find these questions particularly pertinent as they prepare preservice teachers and support veteran teachers in their practice. In this paper, we examine the perceptions of beginning education students through their responses to questions about children, childhood, and the role of teachers, and we examine if a common experience of teachers – reading a children's book – may prime particular responses.

'Childhood,' a term commonly used outside of scholarly disciplines, is implicitly assumed to have a common, shared meaning. However, there is reason to question this assumption. A common dictionary definition such as "The state or period of being a child" (Merriam-Webster, n.d.) is ambiguous, leaving the construct open to many interpretations. Many scholars in different disciplines have come to view childhood as a social construction that varies from society to society, group to group, and family to family. In one case, childhood was described as "neither universal nor natural rather it is tied close to social circumstances and cultural process" (Norozi & Moen, 2016, p.79). This view implies that childhood is not a static and objective construct. Therefore, in order to study the fluidity and dynamic nature of this construct, it is necessary to examine multiple and varied perceptions of childhood. In addition, it is informative to take into account the historical evolution of childhood perceptions held by societies and acknowledge the magnitude of the impact those perceptions have on contexts for child development, including adult-child interactions. Insight into past perceptions of childhood and the resulting contexts and social interactions pave the way for a better understanding of today's interpretation of childhood as a social construction and future implications of the construct, including for teachers and teacher educators.

Childhood as a Social Construction: Past, Present, and Future

The Past

Child development experts have documented the historical progression of children's images and place in society across historical eras (e.g., Berk, 2016). For example, in the ancient times abandoning or even intentionally killing children resulted in mild or no punishment suggesting that an adult had the power to determine the value of the child's life. In the middle ages, children were viewed as 'miniature adults,' being expected to contribute to the family unit economically through labor. In the late 17th century, Locke challenged the then prevalent doctrine of original sin, claiming "the child's innocence was the innocence of ignorance and that the child's mind was a *tabula rasa* waiting for experience and ideas" (Seaford, 2001, p. 455). In the Victorian era, emphasis on positive reinforcement and

cheerful surroundings for children reflected a new appreciation for the formative years of childhood.

Evolving views of childhood correspond with evolving educational philosophies and practices across time (Jalongo & Isenberg, 2008). Rousseau's publication of Emile in 1762, marked a turning point as he introduced a modern view that valued childhood as a distinct period in life and characterized children as spontaneous, joyful, strong and pure (Seaford, 2001). Rousseau inspired a movement towards a maturational view that emphasized the importance of letting development unfold with minimal intervention from the environment. Pestalozzi and Froebel's educational philosophies were guided by this perspective. In the 20th century, theorists and philosophers such as Piaget, Vygotsky, Erikson, Montessori, and Dewey portrayed the child as a psychological being, researching the children as individuals developing cognitively, socially, and emotionally. In 1896, Dewey co-founded what became known as the "Laboratory School" in a small house near the University of Chicago. He envisioned this school as a "laboratory" where teachers could research and experiment with innovative educational approaches (Knoll, 2014). Laboratory schools served an important role in the progressive education movement. By the late 1900s, Brazelton (1994) focused the attention of parents and teachers on the importance of emotional ties and bonds and the impact of strong relationships on the development of the child and acknowledged the limitation of linear models such as those presented by the 20th century theorists. The idea of children developing in universal, predictable stages was challenged and replaced with the acceptance of the complexity of interactive contexts in which children grow.

The Present

Today, our world is even more transparent to the way our images of childhood manifest themselves in our socialization practices, policies, and socio-cultural sensitivities (Leira & Saraceno, 2008). As much as 'childhood' is a standard term, we are increasingly aware of diverse perceptions that surround this term. An intricate network of inter-subjectivities of race, color, socio-economic status, gender, family structures, regionality, and other elements of diversity guide the social construction of how we understand it. Present day teacher preparation curriculum is informed by a deeper awareness of how socio-cultural influences impact child development. These include the impact of inequities in political structures on opportunities for children (National Council of Teachers of English, 2016) and the growing impact of media on children's lifestyles, leisure, and participation choices (Livingstone, 2002; Rustin, 2016). Teacher educators guide preservice teachers to recognize and be responsive to representations of diversity including in children's literature (Larkin-Lieffers, 2010; Koss et al., 2018) and to value the image of the child as an active constructor of knowledge (NAEYC, 2009).

Of significance in the field of early childhood education today, is the Reggio Emilia Approach, inspired by the views of Loris Malaguzzi. He wrote:

> Children have the right to imagine. We need to give them full rights of citizenship in life and in society. It is necessary that we believe that the child is very intelligent, that the child is strong and beautiful and has very ambitious desires and requests. This is the image of the child that we need to hold. Those who have the image of the child as fragile, incomplete, weak, made of glass gain something from this belief only for themselves. We don't need that as an image of children" (Malaguzzi, 1994, para. 39-40).

As more teachers witness the power of the positive image of the child and examine the value of educational systems that trust in the capabilities of children, they consider the role of intentional methods other than existing socialization practices in the formation of such an image. Today's laboratory schools continue to embrace a pioneering role in deconstructing and reconstructing images of childhood.

The Future

What promise does inquiry into perceptions of childhood hold for the future of our understanding about adult-child relationships? First, it puts a spotlight on the cyclical nature of socialization and the evolution of societal beliefs. As much as adults' images of childhood guide their interactions with children, children experience and 'make sense' of their world through the very same interactions and form their perceptions of childhood making the cycle a continuous one. "In the last 20 years, studies [have highlighted] the active role of children in shaping the social world they live in" (Avgitidou et al. 2013, p. 392). Second, the inquiry has direct implications for teacher education. Connections have been made between perceptions of childhood and teaching practices. Martalock (2012) compared and described the traditional model, project approach, and Reggio Emilia philosophy to demonstrate how a teacher's image of the child impacts how (s) he teaches. Carter and Roe (2013) found that teachers who held a positive image of children also embraced paradigms of teaching and learning that enable children to be lifelong learners and develop a positive sense of identity.

Laboratory schools' dual focus on preparing future teachers while simultaneously delivering high quality educational

experiences for children make these schools especially sensitive to how teachers play an important role in raising our future society through intentional interactions in early care and education settings. To best fulfill this role, teachers need to have a heightened awareness of their own image of a child and its manifestation through the way in which they think about, approach, and respond to childhood. The process of socialization is intentional in that it aligns with the values and goals of a society. However, this intentionality may be and often becomes a ritual or practice that is handed down with diminishing reflection of its outcome, relevance to current societal issues, or a general desensitization of its original purpose. Therefore, studying perceptions of childhood for its own sake is a valuable pursuit that can give us profound insights about intentional teaching. An added dimension of such a pursuit is realized through the following question: If perceptions of childhood guide our teaching and interactions with young children then what strategies can be used to facilitate future teachers to re-construct their perceptions so that they reflect the most current research-based practices and endorsed philosophical premises? A common strategy is the presentation of scenarios and case studies to engage teachers in intentional reflection. For example, Curtis (2011), inspired by the Reggio Emilia Approach used real life stories about early childhood teaching from her experiences as a prompt to invite readers to actively reflect on their existing image of a child. Our interest in this idea of facilitating the re-construction of perceptions, however, is rooted in a different strategy, priming.

Priming

Priming is a strategy that has been used to change existing perceptions in different areas such as health (Harris et al., 2009), and emotional competency (Schutte & Malouff, 2012). With this is mind we questioned if listening to a children's book that portrays a child as a strong and competent protagonist in her own learning and development and childhood as a time of imagination and wonder could prime first-year education students to describe children and childhood characterized by those qualities. Teacher educators and other college level instructors have recognized the value of children's books in working with their adult students (e.g., Hansen and Zambo, 2005). Research provides evidence that children's books can facilitate desired understanding and perspective-taking in adults, including in the context of teacher education programs, where teacher educators have also found value in using children's literature to help their students reflect on topics of gender equity (Lowery, 2002), racial and socioeconomic equity (Masko & Bloem, 2017), and cultural diversity and competence (Escamilla & Nathenson-Mejía, 2003; Gibson, 2012; Iwai, 2013; Landa & Stephens, 2017). Lowery (2002) reflected:

> Educators have realized the potential in sharing children's literature to help preservice teachers tackle a myriad of issues. Stories help us to overcome obstacles, accept different perspectives, and develop personal goals. Stories allow us to see and recreate ourselves. As we read stories from different genres and on many topics, we learn to make meaning of the life experiences around us and begin to connect with others. Children's literature does more than allow us to empathize with others. Through skillfully woven stories, we learn to value each other. (p. 27).

No known research has explored how children's books may be used to impact education students' perceptions of childhood and teaching. Influenced by this, our larger mixed-methods research study included exploration of beginning education students' perceptions of childhood, teaching, play, and childhood memories, as well as tested the priming effects of a particular children's book. This paper is focused on participants' perceptions of children, childhood, and the role of teachers. We quantitatively tested the hypothesis that the children's book that portrays a child character as a strong and competent protagonist in her own learning and development and childhood as a time full of imagination and wonder could prime first-year undergraduate students majoring in education to report more positive/less negative views of the image of the child (in comparison to non-primed participants). In addition, we explored if participants in the two conditions differed in their views of the role of the teacher. We also qualitatively analyzed participants' narrative descriptions of childhood and to explore in what ways, if any, participating in the priming event differentiated the perceptions they described.

Method

Participants

Participants were 108 freshman college students (age range=18-19 years; 95.4% female; 95.3% white) from Northwest Missouri State University participating in a freshman seminar for education majors. Northwest is a moderately selective institution with an enrollment of over 6,000 undergraduate and graduate students. The university's Professional Education Unit is dedicated to preparing teachers, counselors, and administrators for the state's and nation's school system. Among the schools supporting the Professional

Education Unit is the Horace Mann Laboratory School. Horace Mann's motto, "A Higher Education Begins Here," reflects the school's focus on both serving an important role for the university education students while simultaneously providing high quality education to K-6th grade students.

The university instructor of the freshman seminar course informed her students they were invited to participate in the study during their regularly scheduled class period. Informed consent was obtained from all individual participants. Of the total 108 participants, 14 (almost equally distributed across the two conditions of the study) completed the quantitative but not the qualitative component of the survey (they left the open-ended questions blank) so the qualitative analysis is focused on the data provided by the 94 participants who provided answers.

Random Assignment and Priming Event

Participants were randomly assigned to one of two conditions (primed or control) and instructed to report to the classroom corresponding with their condition assignment. Participants were not informed of the study's experimental nature and blind to their study condition. Random assignment resulted in 60 participants in the primed and 48 in the comparison conditions.

Participants in the primed condition experienced the priming event, the presentation of a children's book selected by the study's eight researchers. The researchers explored children's literature and held meetings to read and discuss the books with the goal of selecting a book that aligned with Malaguzzi's (1994) concept of building an image of the child as strong and that placed value on children's right to explore, construct understanding, and express themselves through play. After careful review and discussion, the researchers selected the book "When Stella was Very, Very Small" by Marie-Louise Gay (2012). This story focuses on a child, Stella, and her younger brother, Sam. Stella is depicted as a strong protagonist exploring her world, including through play, and constructing understanding based on her own unique perspective (e.g., seeing words in books as looking like ants running on the pages). A Microsoft PowerPoint presentation of the book was created including images of the book pages (both pictures and words) and audio of a woman reading the text from each page was created.

Immediately following the presentation of the book (image and audio through the projector in the classroom), primed group participants completed a questionnaire that included a combination of measures that utilized Likert scales or asked participants to circle their choices from a list of words and open-ended questions. Comparison group participants completed the same questionnaire in their respective classroom, but without any preceding priming event.

Data Collection and Analysis

Quantitative Data

Measures of the image of the children and the role of teacher were adapted from Carter and Roe (2013). Carter and Roe were influenced by Malaguzzi's concept of the image of the child and their review of literature on children's social-emotional development when they developed a list of 20 words that could be used to describe one's image of the child. These included a combination of words associated with an image of the child as strong and as weak (see Table 1). Participants were instructed to use a 3-point Likert scale to indicate the degree to which each word aligned with their perception of children. Mean scores for each of the items were calculated for the primed and comparison condition groups.

Carter and Roe were considered the authoritative teaching paradigm when they developed a list of nine roles that teachers might assume (see Table 2). We provided participants with the list of words and instructed them to: "Select and circle the 4 words that you think best describe what you think teaching is about." The number of participants from each condition who selected each item as being among their top four prioritized teacher roles was determined.

Quantitative statistical analyses were conducted using IBM SPSS 22. Independent t-tests were used to examine if there were statistically significant ($p < .05$) mean differences for the primed group and comparison group on each of the image of the child items in order to test the hypothesis that the primed condition group would report more positive views of the image of the child (i.e., higher scores for words associated with a strong image of the child; lower scores for words associated with a weak image of the child), than the comparison condition group. Levene's Test of Equality of Variances was used when completing the analyses, allowing us to either confirm that data met the assumption of homogeneity of variance for the two groups or to correct for violations using "equal variance not assumed" option which includes an adjustment to the degrees of freedom using the Welch-Satterthwaite method. Chi-square tests of independence were performed to explore the relations between assigned condition and whether or not the participants selected each of the teacher roles as among their top four choices ($p < .05$).

Qualitative Data

Included in the questionnaire was the open-ended question: "What characteristics do you attribute to childhood?" Participants' handwritten responses were typed up by a research assistant and compiled into two documents, one with control group participants' responses and a second with primed group

participants' responses. The qualitative component of this study was two-fold in that its purposes and included (1) describing the beginning education majors' perceptions of childhood, and (2) examining if there was a possible influence of the priming event on participants' expressed views. Consequently, the first wave of coding for the study was focused on the control group participants' responses so that the themes identified in the control group could serve as a "baseline" to which the primed groups' responses could be compared. We first independently coded the control group participants' responses. Informed by qualitative coding procedures described by Creswell (2012), we read the text data line by line, identifying similarities, and attempting to reduce codes into main themes. We then met to discuss and come to consensus on main themes. With these themes in mind, we then moved to the second wave of coding, coding of the primed group participants' responses. We examined if the themes identified in the control group data were also observed in the primed group data as well as explored if any new themes emerged specifically for the primed group. As was the case with the control group data, we first coded the primed group participants' responses independently, and then met as a team to discuss and come to consensus. In some cases, we compared how frequently particular key words and ideas were present across the control and primed groups' responses to help us understand patterns (we did not test statistical significance of differences).

Findings
Quantitative

Image of the Child

The result of Levene's Test of Equality of Variances confirmed that the assumption of homogeneity of variance for the two groups was met for fifteen of the image of the child items. For the five items that violated this assumption by having a statistically significant difference ($p <. 05$) on Levene's Test of Equality of Variances (capable, optimistic, dependent, secure, and nervous), the appropriate t-test for equality of means output ("equal variance not assumed") was used. Results included statistically significant mean differences (using $p < .05$) between the primed and comparison condition groups on three of the ten items for the image of child as weak, with primed condition group participants rating children as less vulnerable (p =.03, d =.43), less fragile (p =.001, d =.66), and less nervous (p =.003, d =.59) (see Table 1). We found no statistically significant differences between the groups for items for the image of the child as strong, though the mean difference approached statistical significance (p =.065) for views of children as optimistic, with the primed condition group rating children as more optimistic.

Roles of Teachers

The relation between assigned condition and selection of teacher role was significant for the role of empowering, $X^2(1, N = 108) = 7.72$, p =.005, φ = .27. A greater percentage (68.3%) of the participants in the primed condition group selected empowering as among their top four choices for the role of the teacher than did participants in the comparison condition (41.7%). There were no statistically significant (using $p < .05$) relations found between assigned group and whether or not the participants selected the specific role for the other eight roles. Table 2 shows percentages of participants from the two conditions who selected each of the specific teacher roles as among their top four choices.

Qualitative

Three main themes were identified in the control group data. These same themes were also present in the primed group data, although there were some nuances that distinguished the two groups, as is discussed below.

Children as "Beings" vs. "Becomings"

Participants' responses resonated with the belief that childhood is an important time of life. Nonetheless, the participants communicated contrasting reasons for holding this belief. Some responses reflected a view of childhood as a time of life that is special in its own right, whereas other responses focused heavily on how childhood is important because it affords opportunities for particular experiences that are requisite for becoming successful adults. Put another way, some participants explained the value of children's experiences in the present, in the here-and-now of childhood, whereas other participants focused on childhood having value because it serves as a transition to adulthood.

Children as "Becomings". Some responses seemed to conceptualize children as on route to "becoming" a person and/or the value of the future (adult) version of the child. Participants 43, 7, and 5 respectively, described children:

> *Childhood is a time where you are growing into the person you will one day become.*

> *Your childhood is very important. It describes how you are going to be when you grow up.*

> *Children are important to the future of the world; they will become leaders, influential people, and pass down their education as well.*

Children as "Beings". Whereas the above views focused on who the child will be someday, other participants' expressed views focusing on who the child is now. Aligning with the concept of children as "beings," participant 54 expressed an appreciation for children that seemed to place value on the child as a person in the here-and now:

> *Children are some of the best humans in the world. They can teach you so much. I have little cousins and a nephew who do things that I didn't even know as a child. They have the best imagination. They help me see a different reason for life.*

Participant 67 expressed views suggesting that she sees children as capable persons now (as opposed to persons who will be capable once they grow up):

> *Childhood is a time for kids to think for themselves and use their knowledge/ imagination to have ideas on things.*

Another participant (8), expressed that children are entitled to the same considerations as adults (as opposed to a view that children will *someday* be entitled to these considerations):

> *Children are human beings, they need to be treated just like you would treat an adult.*

This respect for children as "beings" was taken a step further by participant 61. Whereas some may view children as being incomplete adults, this participant seemed to suggest that children are complete and adults are the ones who are often incomplete:

> *Children are creative minds with a unique capacity to love without reason and create that we often lose as we get older.*

Over half (56%) percent of the participants' responses were coded as reflecting the children as "beings" vs. "becomings" theme. A small subset of these participants (about 12% of participants whose responses were coded as reflecting this theme) had responses that combined statements reflecting views of children as human "beings" and as human "becomings." Importantly, we found that the number of participants in the two conditions expressing views coded reflecting views of children as "becomings" versus "beings" was disproportionate. A greater percentage of primed group participants' (56%) than of control group participants' (17%) responses were coded as reflecting a view of children as "beings." The pattern was reversed for the view of children as "becomings," with a greater percentage of control group participants' (42%) than of primed group participants' (29%) responses being coded as reflecting this view.

Innocence and Wonder

Participants seemed to pull from a culturally and socially constructed reservoir of ideas reflecting conceptualizations of children and childhood that have roots in philosophies. Participants commonly described children as inherently good (i.e., innocent) and expressed views that suggested that childhood should be a protected period of life. Related, several participants' responses suggested an assumption that youthfulness is associated with playfulness and wonder, including words such as playful, curious, explorative, creative, and imaginative.

The following quotations are from the responses provided by participants 14, 17, and 18, respectively. These participants described children as naive, with this possibly being an endearing rather than a critical view as reflected by how participant 18 (in the final quote) seems to suggest that it is such naivety that allows children to be carefree:

> *A childhood is optimistic. A child has a kind heart & a simple view of the world.*

> *A child is... innocent - they don't quite understand everything yet.*

> *A childhood is a fun, carefree stage in your life. During childhood you don't understand all of the adult happenings around you. You have no worries.*

Participant 16 similarly described childhood as worry free, and taking this idea a step further by contrasting the idealized worry-free childhood with the reality of adulthood:

> *A child has the ability to say and do activities without ever worrying what others think, unlike adults. Characteristics that I attribute to childhood are definitely the freedom to do whatever one wants without any worries.*

Innocence and wonder seemed to be intertwined with imagination and play for Participant 31. She reflected on this, incorporating a specific hypothetical example to illustrate:

> *Childhood is a time of innocence and wonder. Imagination is the most important key to development. If you start your child off with the*

> *'right' answers, it makes it harder for them as a kid. A child needs to be able to play pretend. Something that I've learned observing children is they learn to problem solve with toys. One minute a block is a car in a race, then a tasty snack for dinner, and then it could be a block in a house that's being built. Kids need imagination to help them problem solve and make quick decisions based on how the game/ environment changes.*

Participant 53 also suggested that wonder and play are intertwined, choosing to use an example of her own recollections of play memories to illustrate:

> *Childhood is a time of wonder. Everything is new and wonderful to a child. They can create a game out of anything or go on adventures in their own backyard. When I was a child, one of my favorite things to do was build a blanket fort. Once, my little sister and I made our blanket fort a rocket and we flew to Mars. I see childhood as a time where a child's imagination has no limits. They see the world as an enormous place with countless possibilities.*

We examined the participants' responses to see the number of times that specific keys words related to innocence, wonder, and related ideas were used. The primed and control groups were similar in terms of the percentages of participants who specifically described children as innocent (11.5% of primed; 9.5% of control) and who indicated that childhood is (or at least should be) a time when children are carefree[1] (17% of primed; 12% of control). However, in contrast to the control group (26%), a greater percentage of participants from the primed group (46%) described children as playful, and this trend was also observed for describing children as imaginative[2] (25% of primed; 12% of control), creative (13% of primed; 2% of control), curious (8% of primed; 2% control), and explorative[3] (15% of primed; 5% of control).

Theories about Dispositions and Roles of Children and Adults in Learning

Participants' responses included integration of ideas reflective of developmental theory (e.g., constructivist, behaviorist), albeit implicitly. Whereas the names of theories and theorists were absent, general ideas integral to the theories were present. Participants' responses distinguished differences in the roles and dispositions of children and adults in the learning process. Some participants described children as having dispositions that include naturally curious, active, and taking initiative for their own learning. Whereas participants did not use the word "constructivist" in their responses, several of them seemed to hold images of children consistent with Piaget's view of the "little scientists" who explore and experiment with the world around them to better understand and navigate life. From this perspective, children are viewed as intrinsically motivated to learn. Along these lines, some participants described learning as a process in which children should assume an active and leading role in their learning (i.e., child-driven). When children are viewed in the "driver's seat" of the learning process, they are in charge of what they chose to explore and what direction they want the learning to go in. This has implications for the view of the role of the teacher, meaning that a primary role of teachers is to facilitate a positive environment and space to allow the children to structure their own learning process. Although participants did not explicitly cite constructivist theory by name, this viewpoint was implicitly integrated into their responses. This is illustrated by these quotations related to dispositions and roles from participants 6, 62, 71, 67, 100, and 4, respectively:

> *They are constantly wanting to learn new things.*

> *As a child most of the time spent figuring out new things. When this happens a child is usually filled with joy because they learned something new or figured out how to do something on their own.*

> *Childhood is a time for kids to explore the world they have been brought into. It is a time for them to touch everything, taste everything, and ask a million and one questions.*

> *Childhood is the time for kids to think themselves and use their knowledge/ imagination to have ideas on things.*

> *Children are also curious. They ask all kinds of questions, some you may not even have thought about.*

> *I really enjoy teaching them because I feel like I learn more from them, then they do with me.*

1 This included descriptions of care free, free, freedom, and worry free

2 This included descriptions of imagination and imaginative

3 This included any descriptions that included a word starting with explor* such as exploring and explorative

Other participants described children as having dispositions of being moldable and malleable, like empty vessels to be filled, or sponges that soak up the information that is provided to them by someone else. Whereas participants did not use the terms "blank slate" or "behaviorist", their views seemed to reflect related concepts and theoretical views. Following this perspective, some participants described learning as a process in which primarily, the adult's role is to impart knowledge and the children's role is to receive knowledge. Adults directly shape children's understanding and behavior through modeling and reinforcement. Such viewpoints are illustrated below by Participants 2, 12, 36, 99, and 16, respectively:

> *Childhood is a period of time when children are most likely to learn from and be influenced by outside forces.*

> *What you teach them, they soak up.*

> *Children are innocent and do not know rights from wrongs because they must be told what to do.*

> *When you're a child the parents show you the way, teaching you right from wrong.*

> *We learn by picking up on things we see happening around us. We learn by repeating what we heard or pointing at things we saw.*

Both control and primed group participants included discussion of learning roles and dispositions, and there was a range of views discussed within both groups. However, as noted in the discussion of the related theme above, participants in the primed group more frequently described children as imaginative, creative, curious, and explorative, relating to the idea of children as having dispositions of active learners. Also, interestingly, one primed group participant (94) provided a description that seemed especially related to the book that was the priming event. She integrated the idea of imagination in constructing one's own understanding:

> *As a child you play and interact with toys, books, the outdoors, and use your imagination. These experiences can teach you a lot, if not more than another person flat-out telling you information.*

Discussion and Conclusion

What insight can be gained from this study? First, asking beginning education students to respond to the question, "What characteristics do you attribute to childhood?" yielded rich and informative responses. We suggest that there is value in assessing education students' "baseline" views of childhood at the time of college entry as it has the potential to provide important insight for teacher educators as they make curriculum choices and support the development of education majors' educational philosophies, knowing that such perceptions will guide how they interact with children. Teacher educators can use questions like the one we used in our study to prompt reflection and discussion by their students.

Taken together, the quantitative and qualitative findings of our study support previous findings that children's literature may be a useful tool for teacher educators. Our findings included that beginning education students who listened to a children's book that portrays the child character as a strong and competent protagonist in her own learning and development and childhood as a time of imagination and wonder were less likely to endorse some descriptions of children as weak and were more likely to select empowering as a primary role of teachers. Additionally, while in general the responses to the open-ended question about childhood provided by the control and primed group student participants were comparable, one major point of divergence was that there were differences in the two groups' discussion of the value of childhood. Childhood was generally described as valuable by participants across the two groups, but students who listened to the book more frequently described children as what we labeled as "beings" whereas students who had not listened to the book more frequently described children as what we labeled as "becomings".[4] Students who listened to the book seemed more focused on children in the here-and-now, whereas students who had not listened to the book provided responses that reflected what Norozi and Moen (2016) described as a "a journey to adulthood" conceptualization (p. 76). These different conceptualizations of childhood may have important implications. Seeing children as "beings" may help teachers (and future teachers) appreciate the qualities, strengths, and rights that children possess in their current stage of life. These concepts are not new. They date as far back as 1938 when Dewey proposed that education is a process of living and cautioned that approaching education as preparation for adulthood "denied the inherent ebullience and curiosity children brought with them to school and removed the focus from students' present interest and abilities to some more abstract notion of what they might wish to do in the

4 Our use of these specific labels was informed by Kjørholt's (2005) discussion of conceptualizing children as 'human beings' versus 'human becomings.'

future years" (as cited in Coughlin et al, p. 5). Laboratory schools are uniquely positioned to explore priming as an innovative approach to revisit this notion.

Given the exploratory nature of this experimental priming study, we suggest that additional research should examine if findings are replicated, including with more diverse samples. With that being acknowledged, we suggest that one of the most compelling features of our study was that a single reading of one carefully selected book in the absence of guided discussion or other intentional instruction was found to prime participants to report particular views about children, childhood, and teaching. However, we appreciate that teacher educators will likely want to use children's books in more focused and intentional ways with their students, rather than just using them to prime. We suggest that additional research should be conducted to examine the effects of intentionally incorporating these types of books into teacher education on views of the image of the child and roles of teachers and furthermore to explore how it impacts adult-child interactions. Given laboratory schools' dual focus on teacher education and delivering educational programs for children and their emphasis on innovative practices, we suggest that such research is well-suited to be conducted in laboratory school settings. Furthermore, laboratory schools have a unique opportunity to create a collegial environment by using children's literature with their veteran teachers as an opportunity for continued reflective dialogue. As offered by Varlas (2009) "By exchanging knowledge in a collegial environment, both novices and veterans develop new ideas and strengthen their educational practices" (p. 6).

References

Avgitidou S., Pnevmatikos, D. & Likomitrou, S. (2013). Preservice teachers' beliefs about childhood: Challenges for a participatory early childhood education? *Journal of Early Childhood Teacher Education, 34*(4), 390-404.

Brazelton, T. B. (1994). Touchpoints: Your child's emotional and behavioral development. Addison-Wesley.

Carter, M., & Roe, N. (2013). Our image of the child. *Prodecia Social and Behavioral Sciences*. Curtis (2011), Changes in how we see children. *Exchange, July-August, 20-23.*

Coughlin, P. A., Hansen, K. A., Heller, D., Kaufmann, R. K., Stolberg, J. R., Walsh, K. B., ... Open Society Inst., N. Y. N. (1997). *Creating child-centered classrooms: 3-5 year olds. Step by step: A program for children and families.*

Berk, 2016. *Infants and children: Prenatal through middle childhood* (7th ed.). Pearson.

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson.

Escamilla. K. & Nathenson-Mejía, S. (2003). Preparing culturally responsive teachers: Using Latino children's literature in teacher education. *Equity & Excellence in Education, 36,* 238-248.

Gay, M. (2012). *Stella! A treasury*. Berkely, CA: Groundwood Books/ House of Anansi Press.

Gibson, K. (2012). Influences on diversity in teacher education: Using literature to promote multiple perspectives and cultural relevance. *International Journal for the Scholarship of Teaching and Learning, 6*(1), article 13.

Hansen, C. C. & Zambo D. (2005). Piaget, meet Lilly: Understanding child development through picture book characters. *Early Childhood Education Journal, 33*(1), 39-45.

Harris, J. L., Bargh, J. A., & Brownell, K. D. (2009). Priming effects of television food advertising on eating behavior. Health Psychology, 28(4), 404-413.

IALS (n.d.). Retrieved January 03, 2021, from https://www.ialslaboratoryschools.org/

Iwai, Y. (2013). Multicultural children's literature and teacher candidates' awareness and attitudes toward cultural diversity. *International Electronic Journal of Elementary Education, 5*(2), 185-198.

Jalongo, M. R. & Isenberg, J. P. (2008). Exploring your role in early childhood education (4th edition). Pearson.

Kjørholt, A.T. (2005). The competent child and the right to be oneself; reflection on children as fellow citizens in an early childhood centre. In A. Clark, A. T. Kjørholt & P. Moss (Eds.), *Beyond listening. Children's perspectives in early childhood services* (pp. 151- 173). The Policy Press.

Knoll, M. (2014). Laboratory School, University of Chicago. In D. C. Phillips (Ed.), *Encyclopaedia of educational theory and philosophy* (pp. 455–458). London: Sage.

Koss, M.D., Johnson, N. J. & Martinez, M. (2018). Through the sliding glass door: #EmpowerTheReader. *The Reading Teacher, 71*(5), 569-577.

Landa, M. S. & Stephens, G. (2017). Promoting cultural competence in preservice teacher education through children's literature: An exemplary case study. *Issues in Teacher Education, 26*(1), 53-71.

Larkin-Lieffers, P. A. (2010). Images of childhood and the implied reader in young children's information books. *Literacy, 44*(2), 76-82.

Leira, A. & Saraceno, C. (2008). *Childhood: Changing contexts.* Emerald Group Publishing Limited.

Livingstone, S. (2002). *Young people and new media childhood and the changing media environment.* SAGE.

Lowery, R. M. (2002). Grappling with issue of gender equity: Preservice teachers reflections on children's books. *Journal of Children's Literature, 28*(2), 25-31.

Malaguzzi, L. (1994). Your image of the child: Where teaching begins. *Child Care Information Exchange, 3,* 52–61.

Martalock (2012) "What is a wheel?" The image of the child: Traditional, project approach, and Reggio Emilia perspectives. Dimensions of Early Childhood, 40(3), 3-12.

Masko, A. L., & Bloem, P. L. (2017). Teaching for equity in a milieu of white fragility: Can children's literature build empathy and break down resistance?. *Curriculum & Teaching Dialogue, 19*(1/2), 55-67.

Merriam-Webster. (n.d.). Childhood. In *Merriam-Webster.com dictionary*. Retrieved December 11, 2020, from https://www.merriam-webster.com/dictionary/childhood

NAEYC. (2009). *Developmentally Appropriate Practice in Early Childhood Programs Serving Children from Birth to Age 8 [Position Statement]* https://www.naeyc.org/resources/position-statements/dap/contents

National Council of Teachers of English. (2016). *Equity and early childhood: Reclaiming the child. A research policy brief.* https://cdn.ncte.org/nctefiles/equityearlyedbrief.pdf

Norozi, S. A., & Moen, T. (2016). Childhood as a social construction. *Journal of Educational and Social Research, 6*(2), 75-80.

Rustin, M. (2016). Young children and works of the imagination. *Infant Observation, 19*(2), 139-148.

Seaford, H. (2001). Children and childhood: Perceptions and realities. *The Political Quarterly*, *72*, 454-465.

Schutte, N. & Malouff, J. M. (2012). Priming ability emotional intelligence. *Intelligence, 40*(6), 614-621.

Varlas, L. (2009). Better together: Veteran-novice collegiality helps create stronger schools. *Education Update, 51* (2), 6-7.

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Table 1

Descriptive Statistics and Results of t-tests for Image of the Child

	Condition							
	Primed			Comparison				
	M	SD	n	M	SD	n	t	df
Image of the Child								
As Strong								
Proficient	2.18	0.47	60	2.12	0.49	48	-0.63	106
Active	2.97	0.18	59	2.98	0.13	48	0.40	105
Motivated	2.58	0.50	60	2.56	0.50	48	-0.22	106
Capable	2.65	0.58	60	2.79	0.41	47	1.43	104
Curious	2.98	0.13	60	2.95	0.20	48	-0.78	106
Optimistic	2.83	0.38	60	2.67	0.52	48	-1.87	83
Lifelong Learner	2.55	0.53	60	2.59	0.49	48	0.33	106
Confident	2.38	0.59	60	2.46	0.72	48	0.70	106
Hopeful	2.74	0.48	58	2.79	0.41	48	0.57	104
Secure	2.17	0.46	58	2.34	0.48	47	1.81	97
As Weak								
Uninspired	1.20	0.51	60	1.15	0.36	48	-0.62	106
Vulnerable	2.20	0.63	60	2.46	0.58	48	2.19*	106
Fragile	1.97	0.64	59	2.38	0.61	48	3.36*	105
Dependent	2.18	0.72	60	2.13	0.50	48	-0.48	105
Neglected	1.27	0.51	60	1.28	0.45	48	0.44	106
Disinterested	1.33	0.54	60	1.43	0.54	48	0.99	106
Bullied	1.45	0.53	60	1.46	0.50	48	0.08	106
Pessimistic	1.52	0.65	59	1.60	0.64	48	0.62	105
Helpless	1.31	0.50	60	1.36	0.49	47	0.47	105
Nervous	1.60	0.56	60	1.94	0.59	48	3.99*	97

Note: Participants used a three-point Likert scale to indicate the degree to which each word aligned with the participant's perception of children: 1=not at all how I see children; 2=somewhat how I see children; 3=very much how I see children.

* $p < .05$

Table 2

Percent of Participants Who Selected Teacher Roles by Condition

	Condition	
Role	Primed *n* = 60	Comparison *n* = 48
Demonstrating		
Selected	46.7	50.0
Not Selected	53.3	50.0
Directing		
Selected	30.0	39.6
Not Selected	70.0	60.4
Discussing		
Selected	48.3	47.9
Not Selected	51.7	52.1
Empowering		
Selected	68.3	41.7
Not Selected	31.7	58.3
Explaining		
Selected	40.0	45.8
Not Selected	60.0	54.2
Modeling		
Selected	71.7	68.8
Not Selected	28.3	31.2
Monitoring		
Selected	15.0	14.6
Not Selected	85.0	85.4
Observing		
Selected	28.3	33.3
Not Selected	71.7	66.7
Problem Solving		
Selected	50.0	58.3
Not Selected	50.0	41.7

The Effect of Voice Recognition Dictation Software on Writing Quality in Third Grade Students: An Action Research Study

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Abstract

This study investigated whether using a voice dictation software program (i.e., Google Voice Typing) can improve student writing quality. The research took place at Muse Elementary School in a third-grade general education classroom from September 19, 2019, to November 1, 2019. Prompts written by nineteen student participants and surveys of student opinion on writing established a baseline for the study. The data showed that using the dictation software resulted in a 34% increase in the response quality (compared to the Pennsylvania State Standardized Assessment [PSSA] writing guidelines).

Keywords: Educational Technology, Writing Skills, Elementary Education

Chapter 1

I. Background

The research participants are 23 third-grade students at Muse Elementary School in the Canon-McMillan School District, referred to as Canon-Mac, based in Canonsburg, Pennsylvania. The district has a complement of five elementary schools, two 5th- and 6th-grade intermediate schools, one 7th- and 8th-grade middle school, and one 9th through 12th-grade high school, with a total student population of about 7,500. Its geographic footprint spans Canonsburg, McMurray, Cecil, Muse, McDonald, North Strabane, and Eighty-Four.

Muse is a very recent addition to the district and holds approximately 750 students in grades kindergarten through 4th. Due to its size, each grade level has between 6 and 8 classroom teachers and various support staff, incl uding special education teachers, paraprofessionals, guidance counselors, and related services.

As far as the school culture is concerned, faculty and staff in the building face various challenges daily, predominantly because Muse is the combination of three formerly separate elementary schools, faculties, and student populations that merged into one location. The merger sparks many discussions about how the ideologies of the individual teachers can coexist. Colleagues make many compromises throughout a regular school day. The students must be willing to meet and engage with others they had never seen before, distanced from many close friends. Despite these challenges, the 23 subjects of this study seem to do very well in the complicated social aspects presented to them.

The class itself is composed of 14 girls and nine boys ranging in age from 8 years precisely to just shy of nine years. Regarding racial/ethnic variety, the class diversity ratio is far more significant to the school district average, with 69.6% of the class being white and the rest identifying as other ethnicities or races. Four of the students receive special education pull-out services for diverse needs, including emotional support and remedial help with reading and math. The students who receive remedial help utilize a different curriculum than their peers, highly adapted for their individual needs.

II. Research Focus

In the few short weeks that the students have been in class, many show reading and writing difficulties. The majority of their reading levels have regressed from the end of second grade. In a conversation with their teacher, she has "never seen a class fall this much over summer." This pattern considerably concerns this teacher and the other third-grade teachers as well. Most of them report seeing similar patterns in their students while administering reading baseline assessments.

Since reading and writing are tied so closely together in elementary school academics, it is no surprise that the students' writing suffers. The only writing prompts the students regularly experience are incredibly guided exercises such as filling in a blank or completing a sentence with a provided initial clause. Even with this broad base support, about 70% of the class is at a basic or below-basic level when measured using the Pennsylvania Department of Education standardized test writing prompt rubric (Appendix A). Students should know proper capitalization, punctuation, and usage of nouns, verbs, and adjectives in third grade. They

should also be able to write a complete sentence with minimal grammatical errors. Looking at their pre-intervention writing, many have not yet grasped some or all of these concepts.

Teaching students the intricacies of the English language's many grammatical and conventional rules and exceptions often confuse third-grade students because they do not usually use these skills in verbal expression. With their deficits as increased motivation for this study, the data will answer the following focus question: *Can using Google Voice Typing software to supplement traditional pencil-and-paper lessons improve students' overall writing quality?*

III. Literature Review

Given that the advent of voice dictation software is relatively new, the breadth of research on this topic is very limited. However, some studies show the use of this technology to enhance students with disabilities, students below grade level in reading, and English as a second language (ESL) students.

A 2011 study conducted by Morphy and Graham attempted to ascertain whether using word-processing technology could benefit students' reading skills with pre-documented reading and writing deficits. Although differing slightly from dictation, they note that using word processing software such as Microsoft Word or Google Docs has several advantages that students generally find helpful (Morphy & Graham, 2011, pp. 641-642). Error correction without any residual markings, along with the general appeal of technology, students seem to gravitate towards typing traditionally written assignments over handwriting them. In direct relation to this research, Morphy and Graham Determine that student enjoyment, length of the product written, development and organization, and grammatical correctness all improve to varying degrees when students can utilize a word processor (Morphy et al., pp. 658-665). Although the change in grammar and conventions was not statistically significant, it still had a positive trend, indicating a chance for success (et al., p. 659). With Morphy and Graham's study results, I am confident to observe some positive change when introducing voice recognition software.

Another relevant resource focused on a study analyzing how teacher commentary dictated through voice recognition software impacted students' perceptions of the feedback. Conducted by Batt and Wilson, the methodology provides teachers with voice recognition technology to provide commentary on their students' writing. This commentary involves dictating the remarks, measuring the teachers' satisfaction level, and how helpful the students found the new feedback (Batt & Wilson, 2008, pp 166-169). In this case, all participants are adults, and the students receiving feedback undergraduate students in a general education class (et al., p. 167). The researchers determine that the teachers find the new method to go through assignments efficiently; each comment's length also increases from traditional written or typed feedback (et al., pp. 173-175). The students, however, did not see a dramatic quantitative change in the grading and review but noted that the dictation felt much more comfortable and personal (et al., pp 175-176). Given that the researchers found a positive attitude change among the teachers who used voice recognition software and the students receiving comments, I am hopeful that the same pattern will occur in elementary school students.

In contrast to some of the other research, MacArthur and Cavalier choose to direct their study towards dictation software effectiveness as a testing accommodation for students with disabilities. They argue, "for [students with learning disabilities], difficulties with the mechanics of writing interfere with the higher-order processes of composing (i.e., generating ideas, organizing those ideas, expressing them incoherent sentences, and making substantive revisions)" (MacArthur & Cavalier, 2004, p. 45). Since these students typically do not have severe speech disorders impeding their verbal communication, it seems only logical that they could speak and have a computer do the typing for them. After conducting the study, MacArthur and Cavalier showed a statistically significant increase in the quality of the rating among students with learning disabilities (et al., p. 51). When considering the relatively low reading levels of students in this class, the results of MacArthur and Cavalier's study look promising for a positive outcome.

Finally, another very recent study analyzed speech recognition technology's effect on English acquisition for those learning the language. Although focusing on adults rather than young children, Meri-Yilan's work helps solidify dictation software as usable for a broad group of students (Meri-Yilan, 2019, pp. 11-12). In this particular study, English learners use a software program to learn the English language by utilizing voice recognition technology and virtual reality technology (et al., pp. 13-14). After this study, Meri-Yilan determined the majority of her participants felt much more comfortable speaking English and had thoroughly enjoyed learning it by using the software (et al., pp. 14-16). With this in mind, students in elementary school may experience a similar enjoyment level once they begin using voice recognition software to type.

IV. Definitions

For this study, *comprehensibility* will refer to how easily the author's idea translates to the reader. Again using the Pennsylvania Department of Education rubric as a guide, I will break up comprehensibility into the sub-categories of focus, content, organization, and style.

Sentence structure refers to using subject-predicate agreement, proper tense, appropriate capitalization, appropriate punctuation, and an understanding of the English language.

Quality measures the students' understanding of the English language conventions and structure, as shown through their writing. Quality directly ties to their scores on the rubric mentioned above.

V. Audience

This study can influence pedagogy among any teacher who works with students on writing, reading, or grammatical skills. Additionally, it can be used in technology electives and implemented professionally by administrators during performance reviews of their faculty.

Chapter 2

I. Methodology and Participants

Throughout the study, I intend to monitor my students while completing any writing prompt, taking anecdotal notes. Additionally, students must voice type four separate essays in the five weeks of the study to get an accurate read of their proficiency with the software and their improvement in writing overall. To counter ethical issues of working with human subjects, all of the samples and prompts that the students compose will be de-identified before the data compiling and de-identified before the research team can score them. To negate any researcher bias, the primary teacher will help collect anecdotal notes and assess the completed writing prompts.

The participants of this study are 17 third-grade students at a suburban elementary school in southwestern Pennsylvania. In reading assessments conducted during the first month of school, over 75% of the participants are below the grade level average in reading. The teacher reports that they do not receive as much writing instruction as previous third-grade classes. The research omits six students from participation due to concerns this project might impede their reading support instruction as allotted in their Individual Education Plans (IEPs).

II. Baseline Data

Throughout the baseline data collection, students complete a writing prompt (See Appendix E), which gets scored using an adapted Pennsylvania State Standardized Assessment (PSSA) writing rubric for 3rd grade (see Appendix A). While they write, the researcher also collects anecdotal notes about the environment during the writing time. Students complete surveys (see Appendix B) during this baseline data phase revealing students' attitudes and confidence about writing. The surveys prove to be more valuable than anticipated, showing that a significant percentage (42%) of the students feel somewhat comfortable or uncomfortable with writing as a whole, specifically with knowledge of punctuation and capitalization (48%).

During one of the questions of the survey, the students indicate how they feel whenever they write (see Appendices C & D). Shockingly, 77% of the students state that they either feel "okay" or "not so good" about writing in general. Since we know that much of the learning's basis is the motivation to learn, the students' attitudes about writing show that they need a technique that will motivate them to improve their writing. Research also proves technology can be an effective means to entice children to complete an activity they would not otherwise enjoy. Using computer software to aid the writing process, students may find writing to be a less painful and possibly more enjoyable experience.

The baseline data collected has been instrumental in designing the implementation of the intervention for the students. Students often delay their engagement with the prompt during a writing session until they thoroughly think through what they want to write. Students may find that ideas flow easier and sound better when spoken versus when written; using technology simply lets them see it. Using the students' pre-made teams, the class participates in a tutorial lesson about using Google Voice typing software. Then, in their groups, students will practice writing in response to a prompt. Over the next few weeks, the researcher meets with individual groups and has students compose a writing prompt using Google Voice typing. Scoring these writing prompts against the PSSA Writing Rubric, the researcher records the data and tracks students' progress individually and as a class. Hopefully, this technique can produce an improvement in the quality of writing these students create.

III. Timeline of Intervention

Collecting intervention data for this study will take five weeks. The following list is a brief description of the implementation and data collection:

- Week 1: Researcher demonstrates Google Voice typing in the individual groups during regularly scheduled writing time. Also, the primary teacher records anecdotal notes.
- Week 2: The students complete their first writing prompt in Google Voice typing. During this phase, small groups use dictation software to compose authentic writings in response to the first of four separate prompts. Once completed, the primary teacher and researcher score these prompts.

- Week 3: The students complete their second writing prompt in Google Voice typing. The small groups continue to use dictation software to write a response to the second of four prompts at this time. The students make punctuation their primary focus during this time.
- Week 4: The students complete their third writing prompt in Google Voice typing. The students are now very familiar with Voice Typing and complete a third prompt. They focus on making the writing detailed and precise.
- Week 5: The class completes their final writing prompt using Google Voice Typing. The students need to focus on organization and logical flow for this prompt. After tallying all the prompts, the research team analyzes the data.

The researchers document changes to this timeline with the rest of the data. The research team also takes these changes into account during the final data analysis.

IV. Data Collection and Management

The data collected during this time will fall into one of three categories: observational, interview-based, and artifactual. The teacher collects observational data for students who are not completing the digital writing prompt to compare with the researcher's observational data of research participants. Interview-based data is only collected once after completing the final writing prompt (See Appendix F). The researcher asks students to fill out a brief digital survey rating their satisfaction with using the software and their perceptions of writing compared to before starting this project. Due to the nature of research like this, the majority of the collected data is artifactual. All digital writing prompts, and one handwritten prompt for each student are collected, scored, and compared with their baseline scores.

For data collection and management, the research team secures identifying data in an encrypted file in the school district's online database. The researchers hold a secondary copy of this file stored in the University's PittBox secure cloud storage. Any samples of written responses are de-identified and photocopied so that the researcher and teacher can analyze them later. The team destroys these samples upon the conclusion of the project. Once per week, an examination of the data occurs. The data then gets keyed into the master spreadsheet used for the research project.

V. Progression of Data Collection

Throughout the research, most interventions progress pretty well, and the students seem to enjoy this composition method more than paper and pencil writing. The primary assessment method used to quantify the data and analyze it is an adapted version of the Pennsylvania State Standardized Assessment (PSSA) writing prompt rubric. The team uses the rubric and grades each de-identified writing prompt against what the Commonwealth of Pennsylvania feels is essential for third graders to write. Arguably, there is some discrepancy in using this writing prompt because standardized testing occurs within the fourth quarter of the school year. Still, the classroom teacher approves of the use of this tool for this research.

VI. Intervention 1

Within the first week, student scores rise from a total of 11 out of 19 students failing the writing prompt to a total of only two students receiving a rate below 60%. Many of the writing prompts get qualitatively better than the handwritten sample. The improvement may be due to the autocorrect feature of voice typing software. The first week's topics mainly consist of fall and Halloween-based prompts designed to be entertaining for the students to write and shift their focus to other writing types, including explanatory and persuasive. Throughout the entire project, this week notwithstanding, timing ends up being a significant concern. To work with each student, one on one takes about 5 to 10 minutes to complete. In the ordinary course of English Language Arts (ELA) time allotted in the classroom, only three or four students have the opportunity to do a voice typing prompt each day. Despite the limited amount of time, all 19 participants can experience voice typing in this first week. It is important to note that, since this is the first experience for many students, the team must use more instructional time than anticipated to complete a prompt. The increased time means that each student is out of class for slightly longer than in the following weeks.

VII. Intervention 2

In Week 2 of data collection, a conflict with the ELA curriculum prohibits collecting voice typing prompts. Unfortunately, this creates a lapse in the proficiency of students using voice typing software. Data collection resumes during the following week.

VIII. Intervention 3

During the third week, the classroom resumes business as usual, and students can complete voice typing prompts without any scheduling conflicts. As predicted, the students become much more comfortable using the software, and the writing scores demonstrate this. Despite the data showing a plateauing effect, many of the scores still increase, albeit not to the same degree as beginner show transition from written assignments.

Interestingly, many of the samples end up being markedly shorter in length but much better quantitatively when putting against the rubric. More research is needed to determine why this occurs. During this week, many students need a reminder that the expectation for voice typing is the same as for a written prompt; it seems that a few individuals do not take this as seriously as they would a traditional writing prompt. However, once redirected, students readily engage with writing once again.

IX. Intervention 4

Due to an unfortunate timing miscalculation, the fourth week of data collection also coincides with the Halloween holiday and the at-school events. Data for this period split between Weeks 4 and 5. Much like before, the students seem to be making their prompts shorter and less detailed responses. With an additional qualification, the students must come up with at least two details to support their answer and write a minimum of two sentences. Asking for more clarity works with a very slim margin of success, but it does appear to guide the students. At this point, the scores are mostly set, with a few exceptions gaining a few more points by the end of the data collection.

X. Intervention Summary

All in all, the students show a remarkable change. Considering the overall lack of dedicated time, unfamiliarity with the software, and other demands that compete for students' attention, they show improvement. The data collected during this research is truly unique, and the progress made here hopefully allows students to think more carefully and deeply about their writing craft in the future. Upon sharing the findings with the students, many of them verbally note how they feel slightly better at writing themselves in their surveys and think it is a little easier to complete a writing prompt by talking. With the students' opinions in mind, this research seems to be predominantly a success.

XI. Results

Despite the many challenges the students face throughout the intervention and scheduling conflicts that arise, the results show a definitive increase in the students' understanding of writing. The baseline data (See Appendix H - Baseline Section) reveals an average class score of 11 out of 20 using the PSSA rubric. According to the school grade system, this score (55%) would be considered a failing grade. Once the students begin using voice typing (See Appendix H - Intervention Section), scores increase to a class average of 13.6 out of 20. In just the first experience with this new technology, the students show an incredible 23.6% increase in their scores. The class average increases throughout the remainder of the trials, eventually leading to an average rating of 17.9 out of 20. This score equates to an 89% grade overall, a B+ in the school's grading system. From the initial handwritten prompt to the final voice typing prompt, the class average increased by a factor of 62.7%, a very significant jump.

The teacher groups the students into four teams for classroom management, each named a desirable character trait. These teams are called Perseverance, Exuberance, Integrity, and Symbiosis. The researchers compile averages of each group to protect the students' identity in this classroom further. For the remainder of the results portion, assume that each team has between 4 and 6 students. Tabulation of the grades happens individually. Those scores average into a total team score, and each average team score gets calculated into the whole class average figures.

Team Perseverance seems to be the lowest-performing group out of the four, with an overall average score of 52% in the baseline period and only reaching 87% during the intervention. At its worst, the gap between Perseverance and the highest performing team is 11 percentage points. By the end of the intervention, Perseverance manages to catch up to the rest of the teams, with a deficit of only two percentage points behind (87%) the next highest scoring team (89%).

Team Exuberance, in contrast to Team Perseverance, has a history of being very high-performing throughout the baseline and the intervention periods. With an original score of 6 points above the next highest, it is clear that Exuberance has some measure of talent already. With writing prompt 3, they tie for the highest score and stay on top in writing prompt 5. Team Exuberance wavers from being in the top spot only once, during writing prompt 4 by a margin of only three points. Interestingly, Team Exuberance is composed of two of the highest-scoring students in the class and the two lowest-scoring students.

Team Integrity begins with the lowest score of the four teams during the handwriting baseline period. It seems, however, that Team Integrity has a natural penchant for using technology to type; once the intervention begins, Integrity maintains a top spot for the remaining writing prompts. Between traditional handwriting and the initial intervention writing prompt, Team Integrity shows the highest increase in score, averaging 48% in the former and 71% in the latter. Except for the baseline collection, Team Integrity also performs above-average or on the class average on all subsequent writing prompts.

Team Symbiosis is the largest group of students, with six eligible participants in its team, giving it a more rounded

score profile. Before the implementation of voice typing, Team Symbiosis scores above average with 57%. In the first voice typing writing prompt, Symbiosis scores at the class average with 68%, followed by 83% in the following voice typing prompt and 91% in the final attempt. Despite having a larger group size, Team Symbiosis stays pretty well-grounded in the middle throughout this study.

After completing the final writing prompt, the students fill out a second survey (See Appendix G) to assess their writing opinions after completing voice typing. For the most part, the surveys come back slightly more favorable than the first round. Seventy-three percent of the students now feel "good" about their writing ability and their knowledge of writing. An interesting phenomenon to note, preference on the type of response seems to switch from a very diverse set of choices to a predominantly informational text response. Ninety-two percent of the class now seems to prefer writing informative pieces to be persuasive or narrative ones. More research is needed to determine the reason behind this sudden shift in opinion.

Although this data appears quite favorable, the researchers realize they must take a few considerations into account. Firstly, due to the ELA curriculum already in place, the students did not have an opportunity to complete a writing prompt during the second week of intervention. Additionally, the second week of baseline data collection is redacted from the study because the prompt is conducted as a class with each student copying from the whiteboard into their writing notebooks. Other special considerations include whether the choice of prompts is interesting enough to the students, the amount of time spent with individual students, how well each student understands the technological procedures for using voice typing, and unique student learning styles' effects on the overall usefulness of this type of technology.

Throughout the implementation, the scores show improvement with each successive writing prompt. A pattern emerges where many of the prompts become shorter and less detailed. Despite the brevity of the prompts, they are more pragmatically and grammatically correct. During the last two voice typing prompts, an adaptation to the assignment requires students to complete no less than two sentences and include no less than two supporting details. This additional qualification helps, although paragraph formation still never develops in any student's prompt.

Chapter 3

I. Discussion

Throughout the study, the driving focus is to answer this question: *Can using Google Voice Typing software to supplement traditional pencil-and-paper lessons increase students' overall writing quality?* Despite the relatively small amount of data collected, it seems that the trend shows a substantial correlation between this new technique and student writing achievement.

Looking at the overall class average, it is not hard to see why a score jump from 55% to 89% would be desirable. Many interventions already in use utilize a prolonged period to see increases such as this. In this case, it seems only too poignant that students naturally gravitate towards using technology. If educators provide something bright, flashy, and dynamic, students will be more likely to use it, and subsequently, show higher success rates while doing so. Although not quantifiable, seeing a look of pure joy appears on a student's face the first time they use voice dictation software is a moment that captures the power in research such as this. At that moment, a student begins to realize that other tools can help them further their learning, which can also be reinforcing for educators. I do believe that the information found here will serve to diversify the writing instruction handwriting curriculum the school has to offer. A class average increase of more than 30% by using technology already available in the school is a more simplistic solution to student writing ability.

II. Conclusions

One can draw the following conclusions by looking at the research:

- Writing by way of speaking seems to be a more natural way for students to communicate their ideas. Developmentally, most people begin with the spoken word and later transition to using the written word.
- Technology is a significant influence and frequently a source of reinforcement for students — the use of technology in this sense masks the learning aspect in a fun and engaging way.
- Learning styles may play a significant role in the success of dictation software. Students who are more kinesthetic learners and even those who are visual learners struggle a little more with the concept of speaking to a computer and seeing the words appear on the screen.

III. Limitations and Recommendations

Due to the setting, time constraints, and a few other factors, the research fell short in a few areas. Some limitations include the small sample size (19 students), lack of a control group, lack of time to adequately implement the intervention, exclusion of students in reading support, and a few technical issues along the way.

More research can help determine whether technology, the prompts, the student learning styles, or some other aspect may influence the data somehow. Additionally, knowing the students' learning styles and receiving information on their history, both academic and non-academic, would be incredibly helpful in the design and continued implementation of this intervention.

Recommendations for future research also include varying the student's grade level, the academic achievement level, surveying a larger population of students, and eliminating the need for a one-on-one environment to do the voice typing. By looking at different grade levels, the study results can be further generalized to a larger population. Taking more students in total will also help to create a much better picture of the results. Eliminating the one-on-one requirement for conducting the intervention itself serves two purposes: on one side, it adds an element of independence to the student, which may end up showing a more considerable increase in writing ability. On the other hand, it allows the teacher to record observational and survey-based data more efficiently throughout data collection.

Appendices

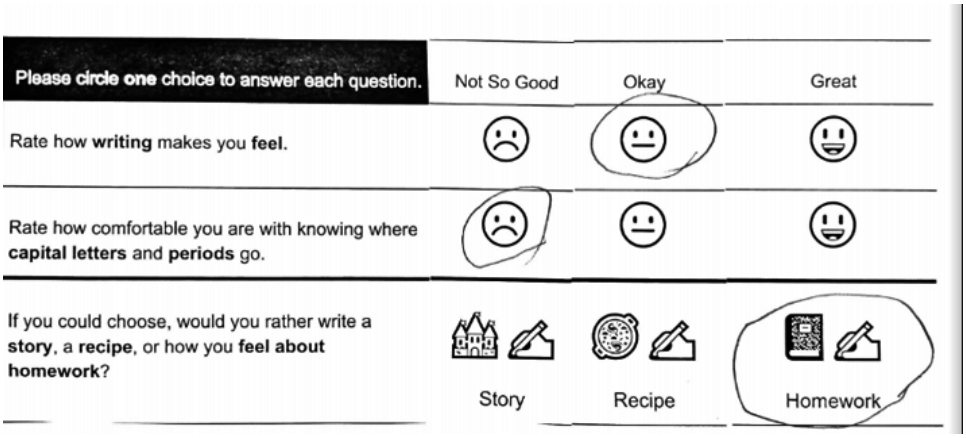
ADAPTED FROM PSSA GRADE 3 WRITING EXPECTATIONS

	1	2	3	4
CONTENT	I do not use details or support when crafting my writing.	I need to use more details when I am writing to make my idea clearer.	I use some details when creating my writing, but I need to better support my topic with more ideas.	I use details and ideas well to support my topic and craft a quality piece of writing.
ORGANIZATION	I have no introduction, body, or conclusion. Many of my ideas are not strung together logically. My writing does not make sense to the reader.	I do not appear to have organized my response ahead of time. I am missing key detail sentences in the paragraph. Many of my sentences appear more like bullet points rather than supporting details. An introduction, body, and/or conclusion are present, but not all are there.	I need to put my story in order. I need to strengthen all parts of my response. I need to use more transition words to help my ideas flow.	I do an excellent job using details to support my argument and their order makes sense. I use transition words to indicate the beginning and end of an idea.
FOCUS	I do not stay focused on the topic at all. My writing is very difficult to follow and understand when someone reads it.	My writing is somewhat hard to follow, and I drift away from the prompt.	Sometimes my writing strays from the prompt. My ideas can be confusing at times, but the general concept is there.	My writing is strong and answers all aspects of the prompt. I do not lose focus when I add details.
STYLE	I use very few detail words and many of my sentences are repetitive or too short.	I use some detail words, but my sentences usually begin and end the same way.	I successfully answer the prompt, but I should try to vary my word choice in the future. Many of my sentences feel identical.	I use descriptive words to help my reader visualize what I am talking about. My sentences vary in beginning and end which makes the reader more interested in what I am talking about.
CONVENTIONS	My writing has so many mistakes that it is difficult to read and understand. More than 10 words are misspelled. Punctuation and capitalization rules are not followed.	I have many mistakes in spelling, grammar, and punctuation. My writing is difficult to understand. Between 5 and 10 words are misspelled	I spell most words correctly, but punctuation and capitalization still need improvement. The meaning of my writing remains intact. No more than 5 words are misspelled.	I have a strong foundation in capitalization, punctuation, and general grammar skills with no errors in these areas. No more than 2 words are misspelled, but the meaning of my writing is still very clear.

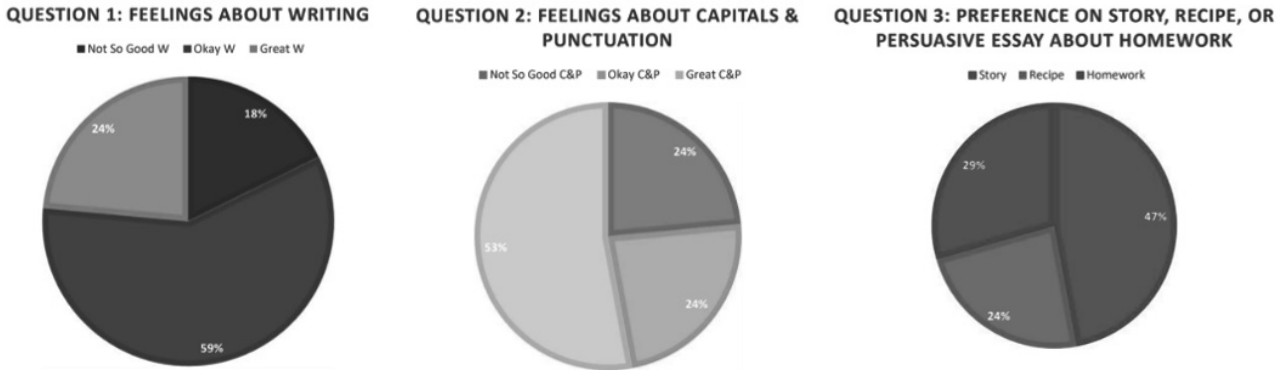
Appendix A - PSSA Writing Rubric

Please circle **one** choice to answer each question.	Not So Good	Okay	Great
Rate how **writing** makes you **feel**.	☹	😐	😃
Rate how comfortable you are with knowing where **capital letters** and **periods** go.	☹	😐	😃
If you could choose, would you rather write a **story**, a **recipe**, or how you **feel about homework**?	Story	Recipe	Homework

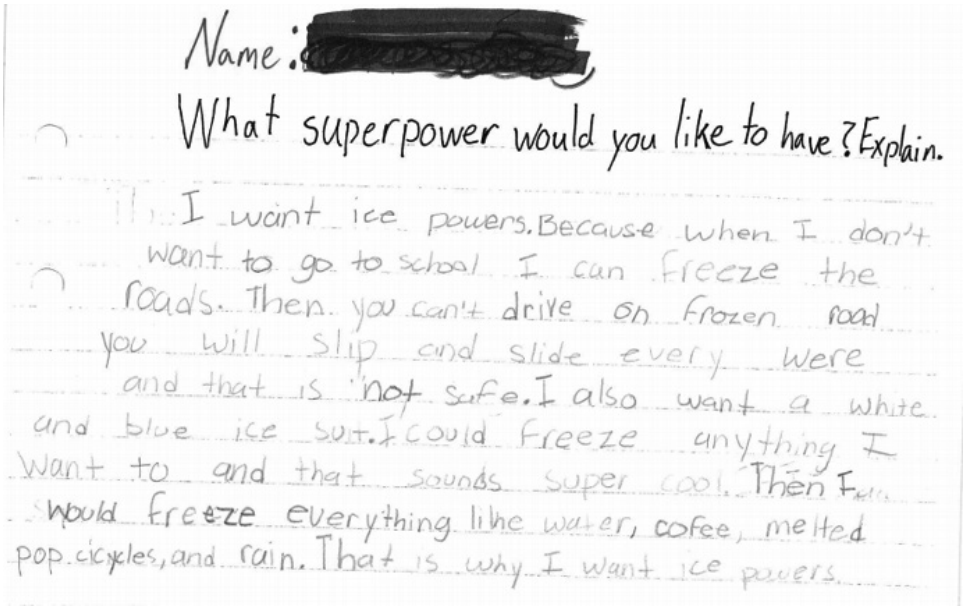
Appendix B - Student Writing Survey Format



Appendix C - Artifact from Baseline Survey



Appendix D - Survey Results from Baseline Data


Name: [redacted]

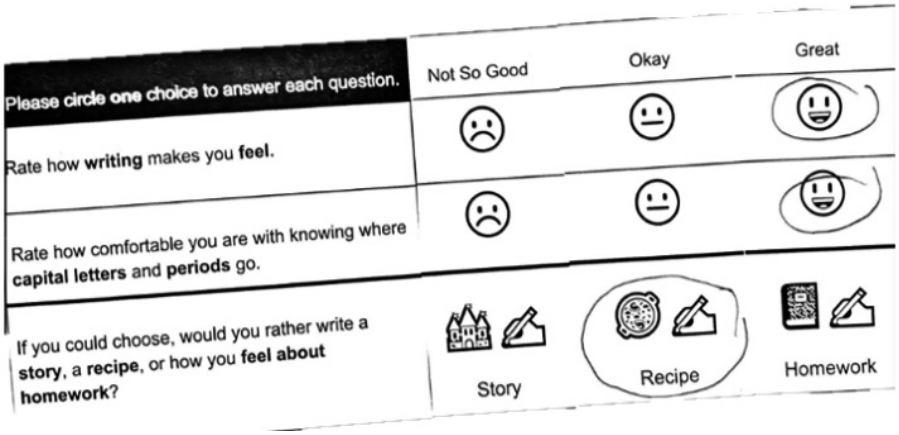
What superpower would you like to have? Explain.

I want ice powers. Because when I don't want to go to school I can freeze the roads. Then you can't drive on frozen road you will slip and slide every were and that is not safe. I also want a white and blue ice suit. I could freeze anything I want to and that sounds super cool. Then I would freeze everything like water, cofee, melted pop. cicykles, and rain. That is why I want ice powers.

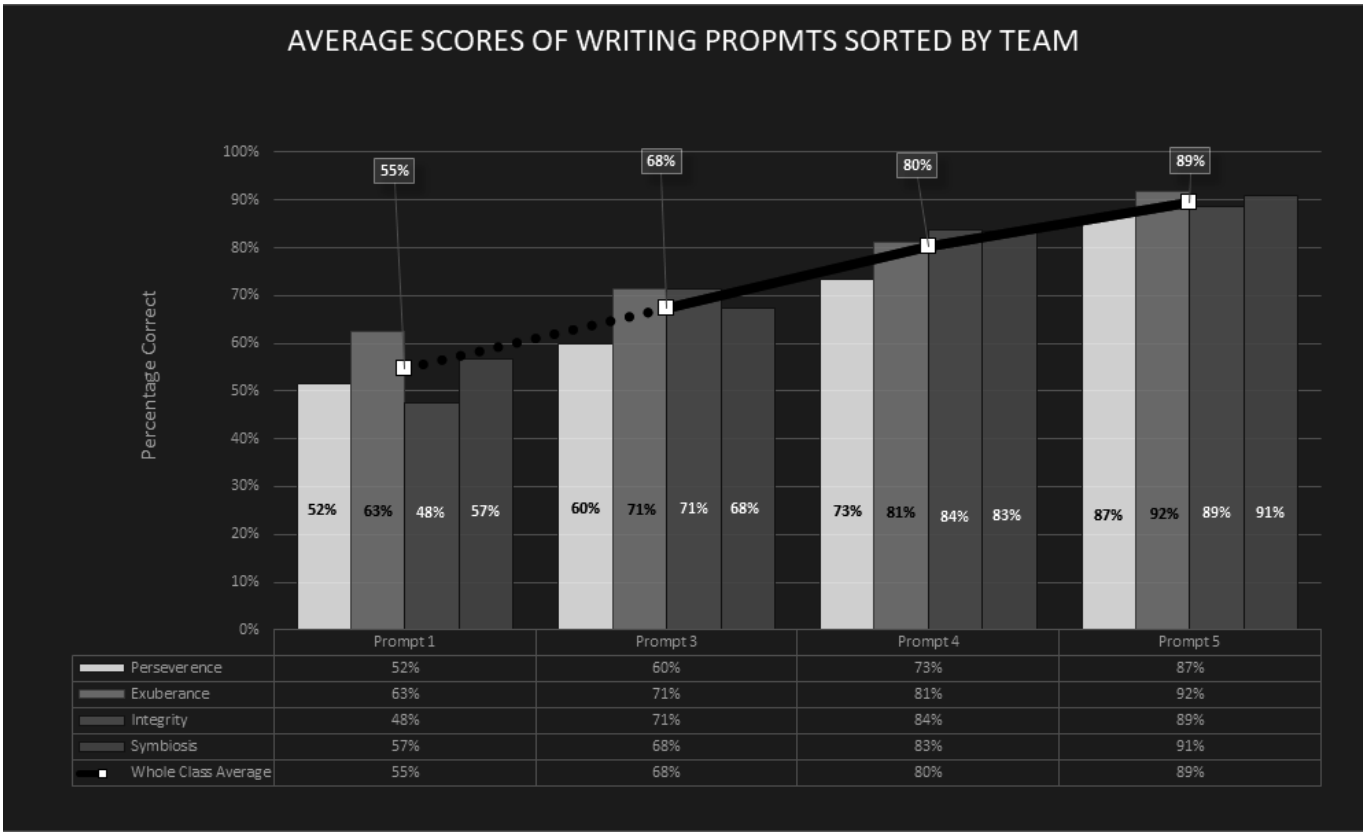
Appendix E - Artifact from Baseline Data Collection

My least favorite part Thanksgiving is mashed potatoes because they're mushy. I also don't like them because I like french fries.

Appendix F - Artifact from Intervention Data Collection (Final Week)



Appendix G - Result from Post-Intervention Survey



Appendix H - Intervention Data Graph

References

Batt, T., & Wilson, S. (2008). A study of voice-recognition software as a tool for teacher response [PDF]. Computers and Composition, 25, 165-181. https://doi.org/10.1016/j.compcom.2008.01.004

MacArthur, C. A., & Cavalier, A. R. (2004). Dictation and Speech recognition technology as test accommodations [PDF]. Exceptional Children, 71(1), 43-58. https://doi.org/10.1007/s11145-010-9292-5

Meri-Yilan, S. (2019). A study on technology-based speech assistants. In A. Plutino, K. Borthwick, & E. Corradini (Eds.), New educational landscapes: Innovative perspectives in language learning and technology (pp. 11-18). Retrieved from https://books.google.com/books?hl=en&lr=&id=65ehDwAAQBAJ&oi=fnd&pg=PA11&dq=%22google+docs+voice+typing%22&ots=96TbfCMaMa&sig=nCsLEv0TxjxAU3R1-kGN-Wb5Qxg#v=onepage&q=%22google%20docs%20voice%20typing%22&f=false

Morphy, P., & Graham, S. (2011). Word processing programs and weaker writers/ readers: A meta-analysis of research findings [PDF]. Reading and Writing, 641-678. https://doi.org/10.1007/s11145-010-9292-5

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Connecting Well-Being and Academic Learning: From Theory to Practice at the Lab School Paris

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Introduction

Since the 2000s, the notions of well-being and quality of life at school, as well as that of school climate have become increasingly important in educational research (Debarbieux, 2016; Kanonire, Federiakin, & Uglanova, 2020; Sarremejane, 2017). The large number of surveys and reports carried out on behalf of national and international organizations also demonstrates the increased interest in this area—for example, CNESCO (Florin & Guimard, 2017; Pinel-Jacquemin, 2016), UNICEF (2007; 2020) or the OECD (2011; 2017; 2020), as well as their explicit consideration in educational policy-making through programs such as the *Law to Overhaul Schools* in France (2013) or the *Every Student Succeeds Act in* the United States (2015).

The definitions of these terms are not always commonly agreed upon and can vary over time. Florin and Guimard (2017) point out the lack of the terms "well-being" and "quality of life at school" in official texts and note that before 2012 the former is "exclusively associated with the physical health of students." It is only from 2012 onwards that the concept of "school climate" is taken up again in official French texts, mainly in regards to security—harassment, discrimination, school justice, and conflict management. It is only in the *Circulaire d'orientation et de préparation de la rentrée* [Advisory on Direction and Preparation for the Start of the New School Year] of 2013 that the word "well-being" is used outside the context of physical health, taking into consideration its psychological and environmental components, and that the phrase "quality of life" is used for the first time (Nguyen Thuy Phuong, 2016). These two terms—well-being and quality of life—are often used interchangeably by researchers and can also be referred to as: "perceived quality of life at school," "subjective well-being," "perceived well-being," "school satisfaction," or "optimal functioning," (Fenouillet, Chainon, Yennek, Lemasson, & Heutte, 2017; Florin & Guimard, 2017).

In the field of psychology, research is often concerned with the subjective well-being of students. Different authors use a variety of theoretical frameworks and their levels of analysis can vary, from the school organization as a whole, to the study of a specific group (for a synthesis of the different approaches, see Florin & Guimard, 2017, and for an overview on the different approaches, Sarremejane, 2017). Regardless of the conceptual framework, many studies focus on determining the factors associated with well-being at school and evaluating the links between well-being—that of teachers as well as students—and students' health, motivation, academic performance or socio-emotional skills (Burton, Lydon, D'Alessandro, & Koestner, 2006; Rascle & Bergugnat, 2016; Schonert-Reichl et al, 2013; Sima, Desrumaux, & Boudrias, 2013; Taylor, Oberle, Durlak, & Weissberg, 2017; Viac & Fraser, 2020). The question of the link between student well-being and success is complex, particularly because of the many determinants, including socio-demographic, individual, and school- or class-related (Florin & Guimard, 2018). However, a positive school climate, meaning an elevated emphasis on well-being or a decent quality of life at school, seem to be commonly associated with academic success (Guimard, Bacro, Florin, Ferrière, & Gaudonville, 2017; O'Malley, Voight, Renshaw, & Eklund, 2015; Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). Research also indicates that "academic achievement does not explain students' quality of school life, but that the relationship is the reverse, i.e. that quality of school life explains academic performance" (Gaudonville, 2017).

It's not that the question of students' well-being was absent from past pedagogues' work (Alexa, 2017); but instead that the emphasis placed upon happiness and well-

being in contemporary societies is new, an unprecedented phenomenon (Cabanas & Illouz, 2018). There is currently a renewed focus on schools' missions, teachers' positions and his or her relationship with students, emotions, and psychosocial skills and their links with learning. In 2015 the French National Education system explicitly added socio-emotional skills linked to well-being, such as empathy, kindness, responsibility, confidence in one's development, etc., to their foundational skills program, the "socle commun de connaissances, de competences et de culture" (similar to the United State's common core curriculum of developmental and academic benchmarks). Since then, the focus on well being in school has become as essential as academics. However, it is not clear how research has contributed to these changes in educational practice in France, and this debate over the complex relationship between research and pedagogy is far from over (Robbes, 2013). Yet, a significant number of recent publications demonstrate educational stakeholders' newfound interest in student well-being and their support of evidence-based decision-making (Courty & Dupeyron, 2017; Garcia & Veltcheff, 2016; Marsollier & Jellab, 2018; Quinlan & Hone, 2020; Serina-Karsky, 2019).

Since its creation in 2015, well-being in schools has been one of the Lab School Network's primary areas of focus. This civil society aims to strengthen the links between practitioners and researchers, in order to use research to support educational advancements. Some examples of projects include organizing an international colloquium on educational well-being, which was held in Paris in October 2017, as well as supporting a professional development group (GDP) that is part of the Paris Academic Unit for Research, Development, Innovation and Experimentation (*Cellule Académique de Recherche Développement Innovation Expérimentation*, *CARDIE*) on well-being in schools since 2017.

Another of the Lab School Network's main goals was to found and create a school inspired by American *laboratory schools,* which places well-being at the heart of its educational project and is also based on scientific research. A *lab school* is traditionally a school backed by a university department or a research institution—the connection between the two organically encourages exchanges between teachers and researchers (Cucchiara, 2010). This experimental process was created at the end of the 19th century by the pedagogue and philosopher John Dewey in order to test his theories about democracy and to better understand how children learn (Durst, 2010). The *lab school* concept seemed particularly relevant to us in France because the use of findings from educational research in everyday practice is still not commonplace (Gaussel, 2020). After two years of collective reflection and development, the Lab School Paris opened at the beginning of the 2017 school year.

This article aims to present the theoretical frameworks on which the Lab School Paris's pedagogical project is based, as well as explain the links between research and pedagogical practices. The first part situates Lab School Paris in the French landscape of alternative schools. The second part examines how research on well-being (Jaotombo, 2019), both in schools and institutions, can permeate the organizational culture at the greater institutional level. In the third part, we will look at the question of the teacher-student relationship and how it affects learning.

I. The Lab School Paris: Just Another Alternative School?

The *lab school* concept had to be adapted in France because university research laboratories are not usually associated with elementary or middle schools. Due to the setup of the French National Education system, it was a challenge to develop this experimental organization model within its structure. This was mainly because they do not allow teacher recruitment methods that enable schools to consider candidate profiles and interests in the specific project, which is necessary in this case, in order to facilitate a cooperative educational team that will be able to collaborate with researchers and research institutions. Since the efforts taken between 2015 and 2017 to try to establish this project within the French National Education system were ultimately unsuccessful, Lab School Paris was opened as a private, independent school managed by a non-profit association, bringing together teachers, researchers and parents.

To position the *lab school* model in the classification proposed by Allam and Wagnon (2018) of the "nebula" or "galaxy" of alternative schools is not quite fitting. Firstly, the opposition between "new pedagogy" and "alternative pedagogy" that they propose does not apply. Although the majority of American *lab schools* recognize the legacy of John Dewey, founder of the first lab school at the University of Chicago in 1896, they also share certain characteristics that Allam and Wagnon attribute to alternative schools, such as not focusing their practice on a particular educational movement or relying entirely on scientific findings. Additionally, unlike most private schools, Lab School Paris project places a great emphasis upon diversity, and has established a graduated tuition scale with fees based upon family income, as well as scholarships that cover all tuition fees for economically disadvantaged families. Finally, Lab School Paris and the Lab School Network do not see themselves as "spurts in the public school system" or as "gravediggers in a "common melting pot," nor do they see themselves as "activists for the

withdrawal, liberalization and privatization of education" (Allam & Wagnon, 2018, p. 3).

On the other hand, if we refer to the distinction made by Lescouarch (2016) between "alternative pedagogy"—which aims "to develop another global approach to learning and which proposes to implement an educational project different from the dominant project"—and "pedagogical alternative", i.e. a set of "didactic and pedagogical innovations constituting a variation of the school form without questioning its internal logic," the Lab School Paris model clearly constitutes an *alternative pedagogy*. It is in this perspective that Lab School Paris and the Lab School Network wish to contribute as much as possible, alongside the French Ministry of Education, to the reflection on the many challenges faced by educators, as well as to the production of scientific knowledge and pedagogical resources.

Currently in its fourth year, Lab School Paris now welcomes 75 students from 1st to 8th grade, in three mixed grade-level classes that are supervised by teacher pairs—one English-speaking and one French-speaking. The school is growing along with the children and the 9th grade class is scheduled to open in September 2021. Thanks to the support of foundations and endowment funds, Lab School Paris is able to continue with their project of building an inclusive school with a truly diverse student body, with children from a variety of cultural and social backgrounds, including socially disadvantaged children, as well as children with special educational needs, particularly those with autism spectrum disorders and learning disabilities.

The support for research and collaboration between teachers and researchers can take many ongoing forms. Firstly, teachers must agree with the school's principles and pedagogical project and be open to having researchers occasionally intervening in their classrooms. Secondly, the team is required to participate in professional development and training seminars every 6-7 weeks during the school year, as well as over the summer. The staff also takes part in the "teacher-researcher" action-research meetings, which aim to develop teachers' reflective metacognitive skills through the sharing of practices—this includes teachers from other schools as well as researchers who are conducting their research at Lab School Paris. This action-research has been interrupted during the Covid-19 crisis, but will start again in Septembre 2021.

Research topics are selected each year by the educational team from proposals submitted by students, doctoral students or researchers from various disciplines (psychology, sociology, anthropology, cognitive sciences, educational sciences). Since 2017, individual research work has been conducted on various topics, ranging from school inclusion, to socio-emotional skills, to democratic practices in the classroom through the study of student councils, to co-teaching and multilingualism. Whatever the disciplinary field, the essential criteria is the relevance of the research for teachers. Indeed, the limitations and additional work required for teachers for certain research projects, such as time to participate in interviews or answer questionnaires, must yield a concrete benefit in terms of professional development.

II. The Organizational Level: Which Theoretical Frameworks Promote Well-Being?

Ideas of happiness and well-being at work are struggling to find their place (Zoïa, 2015) in the professional culture of the French education system. Suspected of being solely at the service of a managerial ideology, these concepts often receive a rather mixed, even decisively hostile reception (Cabanas & Illouz, 2018), even though a growing number of researchers are defending more nuanced positions, which consider certain justified criticisms while integrating elements from scientific work into professional practices, particularly in the field of positive psychology and studies on *care* (Grossetête & François, 2020; Martin-Krumm, Tarquinio, & Shaar, 2013 ; Zoïa, 2015).

In France, as Bouvier (2014) observes, work on organizational learning (Argyris, Schön, Aussanaire, & Garcia-Melgares, 2002) has received little attention from educational institutions. The Lab School Paris promotes well-being as a foundation from which learning—both academic and behavioural—can be utilized for all members: students, the educational team, and even parents. Developing an organizational culture that fosters well-being requires adopting a systemic perspective to work on a school-wide scale and choosing an explicit theoretical frame of reference to guide decision-making and ensure consistent practices within the team.

The Theory of Self-Determination (Deci & Ryan, 2000; Ryan & Deci, 2017) appeared to us to be an analytical framework that is both robust—having been the subject of a great deal of work in the field of educational, organizational and work psychology—and extremely relevant to the Lab School Paris' pedagogical project. This meta-theory of motivation encompasses the question of well-being and the factors that promote optimal functioning through one of the "mini-theories" that make it up: the Theory of Basic Psychological Needs, which are the needs for autonomy, capability and belonging. It illuminates the motivational climate through the different types of motivation, which fall on a spectrum ranging from total lack of motivation to intrinsic motivation and, between these two extremes, four forms of regulation ranging from the least self-determined to the most self-determined: "external", "introjected", "identified" and "integrated" (Deci, Vallerand, Pelletier, & Ryan, 1991; Sarrazin, Tessier, & Trouilloud, 2006).

Many studies have been conducted upon the effects of different types of motivation. Deci and Ryan (2008) evoke the idea that autonomous or self-determined motivation is associated with greater perseverance, more positive feelings, increased performance (particularly for analytical activities) and better mental health; academically, independent motivation is believed to be associated with, among other things, conceptual understanding, academic achievement, creativity, and greater persistence in school and sports activities; in addition, in adults, it is associated with greater ability to overcome injustice, increased productivity, and reduced burnout. Similarly, with respect to the three basic psychological needs, the positive association between their satisfaction and indicators of academic, emotional, and social development in children, as well as well-being, has been demonstrated extensively (Earl, Taylor, Meijen, & Passfield, 2019; Lombas & Esteban, 2018; Ryan & Deci, 2017).

At the organizational level, in order to create a framework that is as conducive as possible to the satisfaction of these three basic needs and to intrinsic motivation, the Lab School also refers to the notion of the "learning organization," which stems mainly from the work of Chris Argyris (1978) and Peter Senge (1990). For the latter, a learning organization is a place where "people continually increase their capacity to create the results they truly desire, where new patterns of thinking are developed, where collective aspirations are fostered, and where individuals continually learn how to learn together." One example of how this concept has been applied in the North American school context since the late 20th century is in the Canadian SchoolNet school network. It is also attracting attention in France. In 2001, Alain Bouvier—a former mathematics teacher, director of IUFM and rector of an academy—published a first book on the subject, *L'Établissement Scolaire Apprenant [The Learning School],* followed by a second, published in 2014, *Vers des Établissements Scolaires Apprenants: Perspectives pour la Conduite du Changement [Towards Learning Institutions: Perspectives for Leading Change],* as well as several articles. A 2016 OECD report describes the main characteristics that make a school a learning organisation, which include developing a common culture based on collaborative work, trust, and also, in many cases, the use of technology to meet the challenges brought about by an ever-changing environment (Stoll & Kools, 2016).

It is even more necessary to specify what we mean by "learning organization" or "learning institution" because the term "learning" has become widely used in France, to qualify all sorts of concepts: from "learning territories" (Bier, 2010) to "learning society" (Bouvier, 2014; Taddei, Becchetti-Bizot, Houzel, Mainguy, & Naves, 2018). Since the early 2000s, a team of researchers at the University of North Carolina at Chapel Hill has been working to define more precisely what characterizes a learning institution (Bowen, Rose & Ware, 2006):

In our definition, learning organizations are associated with a core set of conditions and processes that support the ability of an organization to value, acquire, and use information and tacit knowledge acquired from employees and stakeholders to successful plan, implement, and evaluate strategies to achieve performance goals.

Emphasizing the value of this concept in enabling educational teams to meet current challenges, these researchers developed a tool designed to assess the breadth of learning in schools, the *Success Profile Learning Organization Inventory* (SSP-LO, Bowen, Ware, Rose, & Powers, 2007). It measures two areas: *actions* and *feelings*.

Actions are intentional behaviours and interaction patterns in professional settings: behaviours and interactions that promote new learning, shared responsibility within the school, and the need for a collective ability to achieve the school's goals. Six dimensions are associated with the domain of action:

- Team direction (turning to colleagues when facing difficulty)
- Innovation
- Participation in the institutional life (work culture)
- Information flow
- Error tolerance
- Results focus (rather than problem analysis)

The area of feelings refers to the collective expression of respect for each other, and the consideration of emotions and attitudes of the organization's members towards each other and towards the students. These expressions come from interactions and interpersonal relationships that encourage, support and reinforce integration in the school or institution as well as social harmony. There are also six dimensions to the domain of feelings:

- Perception of a common goal
- Respect
- Cohesiveness
- Trust
- Mutual support
- Optimism

Studies show that this organizational style is positively correlated with employee health and well-being, as well as with job satisfaction and team stability, in various activities and, in schools, with an improved ability to meet students' needs, particularly when it comes to student retention (Berkowitz, Bowen, Benbenishty, & Powers, 2013; Kools et al, 2019).

In order to create a common school-wide culture at Lab School Paris, these theoretical frameworks are clearly

presented to all newcomers and staff members, whether they are classroom teachers, researchers, administration, development staff, extracurricular teachers, interns or young people in civic service. These frameworks are not presented so explicitly to the students, but are, however, ever-present in the attitudes and environment around them. For example, posters on the walls of classrooms read, "I have the right to be wrong," or "*I am not afraid of storms for I am learning to sail my ship*." The Lab School Paris demonstrates the design of a "learning institution" in myriad ways. It is set up with a "horizontal" or "non-hierarchical" structure, and each community member is encouraged to contribute to the project with his or her specific interests, areas of focus and skills. The Lab School Paris also aims to document, reflect upon, and share our experiences, both internally and with other schools, like, for example, in the framework of the "action-research" seminars as well as through publications. Although, as in most organizations, stress, misunderstandings, and disagreements are inevitable, these structures that promote well-being, create common values, and support a shared commitment to the success of both the students and the larger project, and even make it more possible to overcome arising obstacles.

These theoretical references enable us to build a shared conceptual and practical framework within the school, which supports well-being. One essential aspect is teachers-student relationships and interactions, which can play an important role in determining how quality of life at the school is perceived by its community members. We will move on to examine this question more closely in the next section, and focus more specifically on how quality of relations within a school structure can be objectively assessed.

III. The Interpersonal and Relational Level: Which Theoretical Frameworks Promote Well-Being?

Since the beginning of the 20th century various studies, particularly American studies, have shown that the quality of the relationship between the teacher and student is associated with greater future success in many areas and with long-lasting benefits. These benefits can include: reducing aggressive behaviour in at-risk 8-year-olds (Meehan, Hughes & Cavell, 2003); academic growth comparable to their non-at-risk peers for at-risk 1st grade students after one year in classes with teachers that provide strong emotional and pedagogical support (Hamre & Pianta, 2005); reducing cases of externalizing disorders—Attention Deficit Hyperactivity Disorder (ADHD) and Oppositional Defiant Disorder (ODD)—and antisocial behaviours, and prevention of internalizing disorders—such as depression, anxiety, obsessive-compulsive disorder and low self-esteem—according to work conducted by O'Connor, Dearing, and Collins (2011) with 1364 students followed throughout their elementary school years.

According to a meta-analysis by Sabol, Hong, Pianta, and Bruchinal (2013) looking at predictive factors for reading success in preschool-age children, the quality of interactions between student and teacher proves to have the greatest impact, particularly with respect to language development (Leroy, Bergeron-Morin, Desmottes, Bouchard, & Maillart, 2017). Other studies focused on adolescents have shown similar results (Allen, Pianta, Gregory, Mikami, & Lun, 2011; Pianta & Allen, 2008). According to Hattie & Yates (2014), a quality relationship builds student trust in their teacher and subsequently enables them to dare to ask more questions and persevere, even if they make mistakes.

Many interventions and practices are used to both create and maintain a quality relationship between teachers and students. For example, according to research by Driscoll and Pianta (2010), the mere act of teachers spending a few extra minutes each day talking with at-risk students in a caring way outside of classroom activities can change their perspectives upon these students, and foster deeper understanding between adults and children.

Pianta, La Paro, and Hamre (2008) have previously published several studies in this field and have drawn on numerous other works and meta-analyses in order to develop an assessment tool to objectivise the components of relationship quality between students and teachers: the Classroom Assessment Scoring System (CLASS). Dessus, Cosnefroy and Joët (2014), who work on disseminating this tool in France, present CLASS as "a class observation system based on the idea that student-teacher relationships are the main foundation of student development and learning. It makes it possible to evaluate the quality of these relationships through three main areas and ten dimensions, which are themselves observed through precise behavioral indicators".

More specifically, CLASS examines three main areas of how classrooms operate at all levels of the educational system, from preschool to the end of secondary school: emotional support (through four dimensions), which we will present in more detail later on, support for learning (five dimensions) and the organization of the classroom (three dimensions). These three areas are interdependent, and actions aimed at developing one of them can have an effect on the other two; they should not be considered separately, but rather as acting harmoniously.

In this respect, the CLASS tool constitutes an attempt to overcome a classic problem in education sciences: how to analyze teaching practices that are at once complex and varied, "disparate approaches," Bautier (2006) points out:

The description of the [teachers'] activities can be carried out in different ways. In reality, all the levels are intimately

intertwined, but depending on methods and research topics, each observation aims to isolate a certain part of their activities. Surprisingly though, it leaves out the important elements of complexity and heterogeneity. The teacher's work is carried out "in [a certain] context", and the variables that describe this contextualization are so numerous that it is difficult to report on all of them (p. 106-107).

Additionally, CLASS is designed to eliminate any sort of judgment on the quality of teaching practices, and is instead focused on observing the individual indicators for each aspect observed. Dessus et al (2014) note that Pianta's tool can be used for four main purposes. Firstly, it can be used towards the creation of a shared terminology between teachers and researchers—this is one of the ways to remove obstacles that impede cooperation that the Lab School Paris' project is particularly sensitive to. Secondly, it may be used for observation and methodical description of classes, according to a protocol that allows for comparison, the evaluation of classes and, finally, the professional development of teachers.

At the Lab School these different purposes are thought of as a sort of cycle, which is similar to an action-research approach (Stapp, Wals, & Stankorb, 1996). This cycle begins at the establishment of a common relational and pedagogical culture, and then moves to observation, evaluation and training, and back through to the beginning of a new cycle with the observation of new practices implemented. This is done in order to meet the requirements of a learning organization whose team is growing and renewing itself regularly, and which aims to circulate validated practices and to train students and teachers in the midst of their work. Describing the content of such a cycle would be beyond the scope of this paper and will be dealt with in future publications.

As stated previously, in this paper we will focus specifically on the area of emotional support, the beneficial effects of which have already been discussed, and which, in CLASS, has four dimensions: positive climate, negative climate, teacher sensitivity, and consideration of the student's point of view.

According to Dessus et al, (2014), the positive climate refers to the enjoyment that students and teachers show when together, and is demonstrated with smiles, laughter, polite and kind language, physical proximity, shared activities, cooperation, and enthusiasm. Various works can be used to support the choice of these indicators: for example, for the smile, LaFrance (2011) and Siu Man and Hui (2010), for the tone of language, Janis-Norton (2004) and Bissonnette, Gauthier, and Castonguay (2017), and for cooperation, Cusset (2014).

Negative climate refers to observation of elements such as harsh words, shouting, mockery, contempt, and other openly humiliating attitudes, as well as punishment, including physical punishment where appropriate. Again, a number of works on educational practices have previously demonstrated the harmful nature of such behaviour (for a synthesis, see Debarbieux, 2018).

Teacher sensitivity refers to how much attention the teacher pays to students' needs and problems, and how well the teacher is able to anticipate and respond to them.

Finally, taking into account Children's opinions and points of view is as important as taking into account their physical needs, such as the need to move—flexible classroom approaches (Clerc, 2020), implemented at Lab School Paris, contribute to this—as it is to take into account their level of knowledge, in order to escape expertise bias (Hinds, 1999)—the fact that it is often difficult for highly educated people to understand or remember that beginners struggle to acquire the very same knowledge the experts have mastered.

By distinguishing the different dimensions of emotional support that teachers should offer students, the CLASS tool thus becomes a guide for their development, which involves the use of numerous tools, present in several approaches; at Lab School Paris, the Support for Positive Behaviors (Bissonnette & St-Georges, 2014) is one of them.

Although we have focused this third section primarily on students, it is also important to highlight the additional benefits that teachers also gain from quality relationships with their students. Teacher and student well-being are closely correlated (Rascle & Bergugnat, 2016) and Hamre, Pianta, Downer, and Mashburn (2008) show that teachers who provide little emotional support for students generally come into more conflict with them, which can consequently increase their stress. In a context where psychosocial risks in teaching are increasing (Amathieu & Chaliès, 2014; Jégo & Guillo, 2016), CLASS can be seen as an additional means of prevention.

Conclusion

Emphasizing well-being can serve as a kind of "compass" for schools whose project aims to guide students in becoming responsible, enlightened, autonomous, supportive and fulfilled citizens.

Following the practices of Bissonnette et al (2017), the staff reflection process is carried out regularly in order to define and redefine school values, which are then translated into observable, explicitly articulated behaviours and expectations in all areas of school life. In addition to well-being, three values also emerged from a collective brainstorming session during the July 2020 seminar: open-mindedness, community, and engagement.

Well-being is not an end in itself, but rather a means of facilitating an emotionally safe learning environment for

students—notably by limiting social comparison and negative emotions that create cognitive overload and can be detrimental to students' ability to focus on their learning (Monteil & Huguet, 2013). It is also a means of developing critical attitudes and skills in children that help create successful and conscious citizens and prepare them for democratic participation. Additionally, practices that focus on well-being can be a means of modelling social and interpersonal behaviours for children, such as cooperation and support, both through how adults interact with each other as well as how they interact with them. This important issue is bringing together lab schools in Europe, through an Erasmus + project currently underway called LabSchoolsEurope – Participatory Research for Democratic Education (Zenke, 2020), in which values, ideas and practices are shared and questioned collectively.

References

Alexa, C. (2017). Penser le bien-être à l'école en Allemagne au temps de l'Aufklärung. L'exemple du Philanthropinum de Dessau : La marche vers le bonheur. *Recherches & éducations*, *17*. Retrieved from https://doi.org/10.4000/rechercheseducations.3999

Allam, M.-C., & Wagnon, S. (2018). La galaxie des pédagogies alternatives, objet d'étude des sciences humaines et sociales. *Tréma*, *50*, 1-4.

Allen, J. P., Pianta, R. C., Gregory, A., Mikami, A. Y., Lun, J. (2011). An interaction-based approach to enhancing secondary school instruction and student achievement. *Science*, 333(6045), 1034-1037.

Amathieu, J. & Chaliès, S. (2014). Satisfaction professionnelle, formation et santé au travail des enseignants. *Carrefours de l'éducation*, 38(2), 211-238.

Argyris, C., & Schön, D. A. (1978). *Organizational learning: A theory of action perspective*. Addison-Wesley

Argyris, C., Schön, D. A., Aussanaire, M., & Garcia-Melgares, P. (2002). *Apprentissage organisationnel: Théorie, méthode, pratique*. De Boeck université

Bautier, É. (2006). Le rôle des pratiques des maîtres dans les difficultés scolaires des élèves. *Recherche et formation*, 51, 105-118.

Berkowitz, R., Bowen, G., Benbenishty, R., & Powers, J. D. (2013). A cross-cultural validity study of the school success profile learning organization measure in Israel. *Children & Schools*, 35(3), 137-146.

Bier, B. (2010). Des villes éducatrices ou l'utopie du « territoire apprenant ». *Informations sociales*, 161, 118-124.

Bissonnette, S. & St-Georges, N. (2014). Implantation du Soutien au comportement positif (SCP) dans les écoles québécoises. *Canadian Journal of School Psychology*. 29. 177-194.

Bissonnette, S., Gauthier, C. & Castonguay, M. (2017). *L'enseignement explicite des comportements*. Chenelière Education.

Bouvier, A. (2001). *L'établissement scolaire apprenant : L'établissement scolaire et son management, dans la perspective de la conduite du changement*. Hachette Éducation.

Bouvier, A. (2014). *Vers des établissements scolaires apprenants : Perspectives pour la conduite du changement*. CANOPE éditions.

Bowen, G. L., Rose, R. A., & Ware, W. B. (2006). The reliability and validity of the school success profile learning organization measure. *Evaluation and Program Planning*, *29*(1), 97-104.

Bowen, G. L., Ware, W. B., Rose, R. A., & Powers, J. D. (2007). Assessing the functioning of schools as learning organizations. *Children & Schools*, *29*(4), 199-208.

Burton, K. D., Lydon, J. E., D'Alessandro, D. U., & Koestner, R. (2006). The differential effects of intrinsic and identified motivation on well-being and performance: Prospective, experimental, and implicit approaches to self-determination theory. *Journal of Personality and Social Psychology*, *91*(4), 750-762.

Cabanas, E., & Illouz, E. (2018). *Happycratie : Comment l'industrie du bonheur a pris le contrôle de nos vies*. Premier Parallèle.

Clerc, P. (2020). La salle de classe : un objet géographique. *Géocarrefour*, 94/1. Retrieved from http://journals.openedition.org/geocarrefour/14426.

Courty, B., & Dupeyron, J.-F. (Éds.). (2017). *Le bien-être des écoliers*. Presses universitaires de Bordeaux.

Cucchiara, M. (2010). New goals, familiar challenges?: A brief history of university-run schools. *Urban Education Journal.* University of Pennsylvania Graduate School of Education. *Penn GSE Perspectives on Urban Education*, *7*(1). Retrieved from https://www.urbanedjournal.org/archive/volume-7-issue-1-summer-2010/new-goals-familiar-challenges-brief-history-university-run-scho

Cusset, P. (2014). Les pratiques pédagogiques efficaces. Conclusions de recherches récentes. Document de travail 2014-01, France Stratégies. Retrieved from https://www.strategie.gouv.fr/sites/strategie.gouv.fr/files/atoms/files/doc_de_travail_12aout_vupyc-11-09.pdf

Debarbieux, E. (2016). *L'école face à la violence*. Armand Colin.

Debarbieux, E. (Ed.) (2018). *L'impasse de la punition à l'école : des solutions alternatives en classe*. Armand Colin.

Deci, E. L., & Ryan, R. M. (2000). The « what » and « why » of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*(4), 227-268.

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology*, *49*(3), 182-185.

Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. *Educational Psychologist*, *26*(3/4), 325.

Dessus, P., Cosnefroy, O., & Joët, G. (2014). *Évaluer la qualité des interactions enseignant-élèves en début de scolarité : Qualités psychométriques d'une adaptation française du CLASS*. Montréal. Retrieved from https://qualitepetiteenfance.uqam.ca/upload/files/ACFAS/3-diasACFAS-classFR-14.pdf.

Driscoll, K. C., & Pianta, R. C. (2010). Banking time in head start: Early efficacy of an intervention designed to promote supportive teacher-child relationship. *Early Education and Development*, *21*(1), 38-64.

Durst, A. (2010). *Women educators in the Progressive Era: The women behind Dewey's Laboratory School*. Palgrave Macmillan.

Earl, S. R., Taylor, I. M., Meijen, C., & Passfield, L. (2019). Young adolescent psychological need profiles: Associations with classroom achievement and well-being. *Psychology in the Schools*, *56*(6), 1004-1022.

Fenouillet, F., Chainon, D., Yennek, N., Lemasson, J., & Heutte, J. (2017). Relation entre l'intérêt et le bien-être au collège et au lycée. *Enfance*, *1*(1), 81-103.

Florin, A., & Guimard, P. (2017). *La qualité de vie à l'école*. CNESCO.

Florin, A., & Guimard, P. (2018). Facteurs associés au bien-être des élèves à l'école et performances scolaires. *La revue de santé scolaire et universitaire*, *9*(50), 21-23.

Garcia, C., & Veltcheff, C. (2016). *Oser le bien-être au collège*. Le Coudrier.

Gaudonville, T. (2017). *L'impact de la qualité de vie sur les performances scolaires et le développement.* CNESCO. Retrieved from https://www.cnesco.fr/fr/qualite-de-vie-a-lecole

Gaussel, M. (2020). *Les pratiques enseignantes face aux recherches.* Dossier de veille de l'IFÉ, 132. ENS de Lyon. Retrieved from http://veille-et-analyses.ens-lyon.fr/DA/detailsDossier.php?parent=accueil&dossier=132&lang=fr

Grossetête, I., & François, J. (2020). *Les sciences cognitives en pratique : Être bien pour apprendre*. Nathan.

Guimard, P., Bacro, F., Florin, A., Ferrière, S., & Gaudonville, T. (2017). *Évaluation du bien-être perçu des élèves : Étude longitudinale à l'école élémentaire et au collège. Recherche complémentaire (BE- Scol2).* Depp. Retrieved from http://www.cren.univ-nantes.fr/wp-content/uploads/2017/06/Rapport-Be-Scol2-20161.pdf

Hamre, B. K., & Pianta, R. C. (2005). Can instructional and emotional support in the first grade classroom make a di erence for children at risk of school failure? *Child Development*, 76(5), 949-967.

Hamre, B. K., Pianta, R. C., Downer, J. T., & Mashburn, A. J. (2008). Teachers' perceptions of conflict with young students: Looking beyond problem behaviors. *Social Development*, 17(1),115-136.

Hattie, J. & Yates, G. C. R (2014). *Visible learning: The science of how we learn.* Routledge.

Hinds, P. J. (1999). The curse of expertise: The e ects of expertise and debiasing methods on Prediction of novice performance. *Journal of Experimental Psychology: Applied*, *5*(2), 205-221.

Janis Norton N. (2004), *Learning to listen, listening to learn*. Barrington Stoke.

Jaotombo, F. F. (2019). Le fonctionnement optimal psychologique : Apports conceptuels et méthodologiques. *Psychologie du Travail et des Organisations*, *25*(4), 281-300.

Jégo, S. & Guillo, C. (2016). Les enseignants face aux risques psychosociaux : Comparaison des enseignants avec certains cadres du privé et de la fonction publique en 2013. *Éducation et Formations, 92*, 77-113.

Kanonire, T., Federiakin, D. A., & Uglanova, I. L. (2020). Multicomponent framework for students' subjective well-being in elementary school. *School Psychology*, *35*(5), 321-331.

Kools, M., Stoll, L., George, B., Steijn, B., Bekkers, V., & Gouëdard, P. (2020). The school as a learning organisation: The concept and its measurement. *European Journal of Education*, *55*(1), 24-42.

LaFrance, M. (2011). *Lip service: Smiles in life, death, trust, lies, work, memory, sex, and politics*. W.W. Norton & Co.

Leroy, S, Bergeron-Morin, L ; Desmottes, L., Bouchard, C & Maillart, C. (2017). Observer et évaluer la qualité des interactions enseignant.e/enfants à l'école maternelle en Belgique pour soutenir le développement langagier des enfants de 4 ans : une étude exploratoire. *Travaux neuchâtelois de linguistique*, 66, 67-85.

Lescouarch, L. (2016). *Innovations et pédagogies alternatives : l'exemple des méthodes actives*. Communication au Congrès ANCP, Le Havre. Retrieved from http://ekladata.com/-jU0KNc3D259WM3HhKBJSRmr9qk/Innovation-et-pedagogies-alternativesLL.pdf.

Lombas, A. S., & Esteban, M. Á. (2018). The confounding role of basic needs satisfaction between self-determined motivation and well-Being. *Journal of Happiness Studies*, *19*(5), 1305-1327.

Marsollier, C., & Jellab, A. (Éds.). (2018). *Bienveillance et bien-être à l'école : Plaidoyer pour une éducation humaine et exigeante*. Berger-Levrault.

Martin-Krumm, C., Tarquinio, C., & Shaar, M.-J. (2013). *Psychologie positive en environnement professionnel*. De Boeck.

Meehan, B. T., Hughes, J. N., & Cavell, T. A. (2003). Teacher-student relationships as compensatory resources for aggressive children. *Child Development*, 74(4), 1145-1157.

Monteil, J.-M. et Huguet, P. (2013). *Réussir ou échouer à l'école : une question de contexte ?*. PUG.

Nguyen Thuy Phuong. (2016). *La qualité de vie et le bien-être à l'école en France : Quelle place dans les textes institutionnels ? (En lien avec Agnès Florin et Philippe Guimard)*. CNESCO. Retrieved from http://www.cnesco.fr/wp-content/uploads/2016/11/institutions2.pdf

O'Connor, E. E., Dearing, E., & Collins, B. A. (2011). Teacher-child relationship and behavior problem trajectories in elementary school. *American Educational Research Journal*, *48*(1), 120-162.

OECD. (2011). *How's life?: Measuring well-being*, OECD Publishing.

OECD. (2017). *PISA 2015 Results: Students' well-Being*. OECD Publishing.

OECD. (2020). *How's life ? 2020: Measuring well-being*. OECD Publishing.

O'Malley, M., Voight, A., Renshaw, T. L., & Eklund, K. (2015). School climate, family structure, and academic achievement: A study of moderation effects. *School Psychology Quarterly*, *30*(1), 142-157.

Pianta, R. C., & Allen, J. P. (2008). Building capacity for positive youth development in secondary school classrooms: Changing teachers' interactions with students. In M. Shinn & H. Yoshikawa (Eds.), *Toward positive youth development: Transforming schools and community programs* (pp. 21-39). Oxford University Press.

Pianta, R. C., La Paro, K. M., & Hamre, B. K. (2008). *Classroom assessment scoring system: Manual K-3*. Brookes.

Pinel-Jacquemin, S. (2016). *Bien-être des élèves à l'école et promotion de leur santé*. CNESCO. Retrieved from https://www.cnesco.fr/fr/qualite-de-vie-a-lecole/

Quinlan, D. M., & Hone, L. C. (2020). *The educators' guide to whole-school wellbeing: A practical guide to getting started, best-practice process and effective implementation*. Routledge.

Rascle, N., & Bergugnat, L. (2017). *Qualité de vie des enseignants en relation avec celle des élèves : Revue de question, recommandations (en lien avec Agnès Florin et Philippe Guimard)*. CNESCO. Retrieved from http://www.cnesco.fr/wp-content/uploads/2016/11/enseignants.pdf

Robbes, B. (2013). Épistémologies de la pédagogie, relations aux savoirs et à la didactique. *Éducation et socialisation. Les Cahiers du CERFEE*, *34*. Retrieved from https://doi.org/10.4000/edso.434

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press.

Sabol, T. J., Hong, S. L. S., Pianta, R. C. & Burchinal, M. R. (2013): Can rating pre-K programs predict children's learning? *Science*, *341*(6148), 845-846.

Sarrazin, P., Tessier, D., & Trouilloud, D. (2006). Climat motivationnel instauré par l'enseignant et implication des élèves en classe : L'état des recherches. *Revue française de pédagogie. Recherches en éducation*, *157*, 147-177.

Sarremejane, P. (2017). Le bien-être à l'école : Analyse et épistémologie d'une notion. *Recherches & éducations*, *17*. Retrieved from http://journals.openedition.org/rechercheseducations/3530

Schonert-Reichl, K. A., Guhn, M., Gadermann, A. M., Hymel, S., Sweiss, L., & Hertzman, C. (2013). Development and validation of the middle years development instrument (MDI): Assessing Children's well-being and assets across multiple Contexts. *Social Indicators Research*, *114*(2), 345-369.

Senge, P. (1990). *The fifth discipline: The art and practice of the learning organization*. Century Business.

Serina-Karsky, F. (2019). *Bien-être scolaire : Des clés pour demain*. L'Harmattan.

Sima, M. N. N., Desrumaux, P., & Boudrias, J.-S. (2013). Bien-être psychologique et motivation autodéterminée chez les enseignants. *Les Cahiers Internationaux de Psychologie Sociale*, *Numéro 97*(1), 69-87.

Siu Man, L., & Hui, W. (2010). Effects of smiling and gender on trust toward a recommendation agent. In: *Proceedings of 2010 International Conference on Cyberworlds* (p. 398-405). From: 2010 International Conference on Cyberworlds, 20-22 October 2010, Singapore.

Stapp, W. B., Wals, A. E. J., & Stankorb, S. L. (Éds.). (1996). *Environmental education for empowerment: Action research and community problem solving*. Kendall/Hunt Publ.

Stoll, L., & Kools, M. (2016). *What makes a school a learning organisation: A guide for policy makers, school leaders and teachers. OECD.* Retrieved from https://www.oecd.org/edu/school/school-learning-organisation.pdf

Taddei, F., Becchetti-Bizot, C., Houzel, G., Mainguy, G., & Naves, M.-C. (2018). *Un plan pour co-construire une société apprenante. Remis à la ministre du Travail, au ministre de l'Éducation nationale et à la ministre de l'Enseignement supérieur, de la Recherche et de l'Innovation, le 4 avril 2018.* Retrieved from https://www.ac-paris.fr/portail/jcms/p1_1666379/un-plan-pour-co-contruire-une-societe-apprenante?details=true

Taylor, R. D., Oberle, E., Durlak, J. A., & Weissberg, R. P. (2017). Promoting Positive Youth Development Through School-Based Social and Emotional Learning Interventions: A Meta-Analysis of Follow-Up Effects. *Child Development*, *88*(4), 1156-1171.

Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A Review of School Climate Research: *Review of Educational Research, 83*(3), 357-385.

UNICEF. (2007). *Child poverty in perspective: An overview of child well-being in rich countries* (Innocenti Report Card 7). UNICEF Innocenti Research Centre.

UNICEF. (2020). *Worlds of Influence: Understanding what shapes child well-being in rich countries* (Innocenti Report Card 16). UNICEF Innocenti Research Centre.

Viac, C., & Fraser, P. (2020). *Teachers' well-being: A framework for data collection and analysis* (OECD Education Working Papers, 213). OECD Publishing. Retrieved from https://doi.org/10.1787/c36fc9d3-en

Zenke, C. T. (2020). LabSchoolsEurope: Participatory Research for Democratic Education. *IALS Journal*, *10*(1), 40.

Zoïa, G. (2015). Ségrégation contre bien-être : Pour une école du care. *Le sujet dans la cité*, *N° 6*(2), 150-158.

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Reimagining the Curriculum: Preparing Students for the Future

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Abstract

In order to provide a world-class education and prepare our students for the future, the elementary and secondary faculty at Model Laboratory Schools at Eastern Kentucky University redesigned the curriculum and graduation requirements. Based on principles from Understanding by Design (Wiggins and McTighe, 2005), the Model Core outlines a set of core competencies and transfer goals for all students in grades kindergarten through 12th grade. The authors trace the progression of one of these competency areas and its transfer goals, as well as one transfer goal from another competency area, from eighth grade through 12th grade. The authors demonstrate how the courses build on each other and offer an innovative curriculum that prepares students to succeed and lead in the future.

Introduction

"You need the internet to participate in society," notes a student while analyzing an article in class. Another student states, "Giving people equal access to resources and making sure everyone has equal access to the internet should be a priority." A third student asks, "Who will pay for it?" The students fall silent, perhaps they have not thought that far ahead– or maybe they have, and they know the answer will push the discussion into chaos. When asked to give a show of hands, most students reflect the same belief: they want everyone to be able to have access to the internet no matter what the circumstance. One student explains, "These impacted groups, basically non-white middle class and above males have an unequal access to technology and that needs to change." These students have the luxury of discussing the Digital Divide as a theoretical issue; whereas their peers in the school, across the nation, and even the world have experienced the divide themselves due to the widespread effects of the coronavirus pandemic (Vogels, et al., 2020). Although the issue is complex and requires consideration of multiple perspectives, these students are engaged in this discussion not as juniors or seniors in an English or Social Studies class, but as eighth graders in AP Computer Science Principles[5]. While an eighth grade student sitting in Mr. White's AP Computer Science Principles class might expect to be talking about block coding and trying to put pieces of code together to create a program or game, instead the students are talking about current issues and topics related to technology and its role in society. These dilemmas that eighth graders are weighing in on are not limited to the technical world, but rather, extend to the socioeconomic inequalities that prevent people and groups in our society from accessing technology they need in order to participate (Pacino, et al., 2012). If these eighth graders are to develop the skills needed to become the next generation of community leaders, they must be able to take part in these discussions and consider issues from other perspectives besides their own.

For the students of Model Laboratory Schools at Eastern Kentucky University (Model Lab) in Richmond, Kentucky, AP Computer Science Principles is not just a traditional coding course. It is the beginning of a series of courses that combine goals from multiple disciplines designed to develop individuals who can create, design, innovate, think quantitatively and computationally, and engage in analytical discussions about issues from different perspectives. AP Computer Science Principles is one of the first in a series of courses that prepare students to be leaders with critical minds ready to tackle numerous political, social, economic, and other issues.

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A World-Class Education

The world is an ever-changing place, requiring leaders who can adjust to those changes and effectively problem solve. As educators, we also need to help all students compete in an expanding global market (Pacino, et al., 2012). Yet, the skills, knowledge, and understanding needed to be competitive in the job market are different today than they were in the past, and they are likely to be different when current elementary and secondary students enter the workforce. According to the education researcher Yong Zhao (2012):

> Our children will face a society that has been fundamentally changed by globalization and technology... For most of human history, before this wave of globalization and massive technological changes, economies were mostly local and slow changing. In those economies, most people undertook similar jobs that satisfied the local needs. And in many cases, the jobs and their required knowledge and skills did not change very fast, making it possible to predict and thus prescribe a curriculum that by and large could prepare children to find employment... But the world is drastically different now (p. 42).

The reality of the drastically different world creates a challenge for schools—although we cannot predict exactly what the skills, knowledge, and understandings of the future might be, schools are tasked with preparing students to be successful in that world. As with many other aspects of life, however, many schools and their curricula are designed for the world of the past and present, not the future. If schools are to be successful in providing the education necessary for their students to be engaged, active, and contributing members of society, schools must also prepare students for the yet unknown realities of the future.

According to Zhao (2012), the potential for new jobs—particularly those not yet even imagined—is great because of new technologies. Although these technologies may lead to the elimination of some jobs, they will also reveal new and unmet needs; in other words, these technologies will provide opportunities for leadership and a workforce skilled in adapting, creating, and innovating. Recent trends in education toward standardization (e.g., the Common Core) are likely to impede the development of creativity and ingenuity in students, both of which Zhao says are critical for the future. To respond to future issues and needs, students need to be able to transfer their knowledge into new and novel situations, which requires that they learn skills like perseverance, flexibility, and problem solving. No longer will the answers be at their fingertips in a textbook or online resource like it is while most students are in school. Our current students will need to design the answers to these future problems, requiring them to bring knowledge and skills from a variety of disciplines, develop creative solutions to problems, and communicate those solutions in ways that everyone can understand and enact.

Creating a generation of learners ready to lead in the future requires schools rethink their curriculum and ensure that it truly is a guaranteed and viable curriculum (Marzano, 2003) that prepares students for their futures. Such a curriculum provides all students the opportunity to learn the content and skills considered essential for college and career and to do so with the necessary time. The content needs to be sequenced in a way that allows multiple repetitions and a deepening of understanding in a variety of contexts. Educators need to develop understanding by providing students multiple opportunities to use subject matter knowledge in authentic ways and transfer what they have learned to new contexts (Wiggins & McTighe, 2005).

To that end, Model Lab redesigned its curriculum beginning in the 2018-2019 school year. The goal was to create a K-12 curriculum that could ensure its students would graduate high school ready to lead in college and career. Through discussions with a variety of stakeholders, including K-12 educators, college and university faculty, and business leaders, the faculty and staff at Model Lab created the Model Core, which is a set of interdisciplinary competencies and transfer goals (Wiggins and McTighe, 2005) that are the basis for the school's curricular scope and sequence. Students' achievement of these goals is assessed through transfer tasks (also known as performance tasks) in which they demonstrate their understanding of content in authentic and meaningful contexts (McTighe, 2015).

The scenario above concerning the digital divide with eighth grade students in an AP Computer Science Principles class is an example of a transfer task. In the task, the students were required to: 1) find and annotate sources about a social issue or dilemma related to technology, 2) identify who is impacted by these digital dilemmas, and 3) create a policy that could be enacted to resolve the digital dilemma. Specifically, this task is aligned to the transfer goals:

- Communicate a perspective using appropriate media to a targeted audience for a particular situation.
- Design innovative and creative solutions that solve a problem or achieve a purpose.

This task is similar to projects in other subjects that share the same transfer goals. For example, in Media and Information Literacy (the ninth grade English class), AP Seminar and Public Speaking, and Senior Research, the

students also engage in projects aligned to the transfer goal of communicating a perspective using appropriate media. Additionally, in Engineering and Design, as well as other science and arts electives, students engage in tasks that have them designing solutions to problems. In this way, the teachers of different subjects and in different disciplines with the same transfer goals can collaborate on cross-disciplinary tasks that reinforce student learning in multiple contexts.

Thus, rather than design a curriculum around specific courses, the faculty of Model Lab centered the Model Core around eight core competencies: Inquiry, Communication, and Data Analytics; Quantitative and Computational Reasoning; Scientific Inquiry; Global Communication and Understanding; Creating, Performing, and Designing; Humanities; Civic Engagement, Entrepreneurship, and Financial Literacy; and Fitness and Wellness. These competency areas now represent the graduation requirements for Model Lab high school students graduating in 2023 and beyond (see Appendix A for graduation requirements). Within each of these competency areas, there are transfer goals that indicate what students should be able to do with the knowledge they learn and skills they develop (see Appendix B for a full list of transfer goals).

These transfer goals are the same for all students in grades K-12, although the content taught to help students achieve the goals is different at each grade level. For example, one transfer goal in the Civic Engagement, Entrepreneurship, and Financial Literacy competency area is: Apply political and economic theories, perspectives, and models in authentic contexts in order to make sound economic and financial decisions. In second grade, students might open a class store, selling items that they make themselves (e.g., artwork, short stories, paper airplanes, etc.) after surveying classmates about what they might want to purchase. Eleventh and 12th grade students might operate and maintain a school store that sells a wide range of items (e.g., t-shirts, sweatshirts, lunch boxes, notebooks, etc.) as part of a business or marketing class. Their roles would include conducting market research, designing goods to sell, merchandising, and maintaining inventory. In both grades, students apply what they have learned about entrepreneurship and economics in authentic contexts in order to earn a profit. Though the contexts and details are different in these grade levels, the knowledge, skills, and understandings are similar for both sets of students. Through this spiraling of the curriculum (Bruner, 1960), knowledge and skills are reinforced and deepened, and students create new understandings that they can apply to novel situations.

Furthermore, each course offered in all grades K-12 addresses multiple transfer goals, often from multiple competency areas. For example, U.S. History classes in fifth, eighth, and 11th grades address transfer goals from Inquiry, Communication, and Data Analytics; Global Communication and Understanding; Humanities; and Civic Engagement, Entrepreneurship, and Financial Literacy. In this way, students have the opportunity to build interdisciplinary skills and understandings over multiple years and in varying contexts. The ability to think and reason in interdisciplinary ways will allow the students to confront the issues that will face them in the future.

In addition, the scope and sequence of courses was redesigned to strengthen these interdisciplinary connections and highlight the skills that are most likely to help students succeed in college and career. This new scope and sequence began in the 2019-2020 school year and is most obvious at the secondary level, where several new courses were developed and added to the requirements for graduation. For example, all students must take a course in coding and logic, usually in eighth grade, which is fulfilled for most students through AP Computer Science Principles. That course is followed by Media and Information Literacy and Biology in ninth grade, AP Seminar or Public Speaking in 10th grade, AP Statistics or Data Analysis in 11th grade, and AP Research or Senior Research Project in 12th grade. Students also take Chemistry, Physics, or AP Physics in either 10th or 11th grade, as well as an additional science course (e.g., AP Biology, Forensic Science, Engineering and Design) in either 11th or 12th grade. This five-year sequence from AP Computer Science Principles to AP Research/Senior Research Project allows students the time needed to fully develop their skills, knowledge, and understanding of topics related to inquiry, analysis, and communication in multiple contexts. By taking all of the courses in this sequence, students have the opportunity to meet all of the transfer goals within the competency area of Inquiry, Communication, and Data Analytics, as well as at least one of the transfer goals in the area of Scientific Inquiry. Although not every course focuses on all of the transfer goals in the competency areas, at least two of the courses (more than two courses in some cases) focus on each transfer goal.

Inquiry, Communication, and Data Analytics

Following the computer science and coding course, students continue the Inquiry, Communication, and Data Analytics sequence with Media and Information Literacy in ninth grade. Rather than the traditional ninth grade English course, this course focuses on the analysis of both print and non-print materials and the interplay between visual images, video, sound, and social media. Building on the skills learned in AP Computer Science Principles, students use technology to develop visual and auditory representations of ideas. Furthermore, students develop the ability to analyze persuasive

communication in a variety of formats and to develop their own effective communication strategies. The Media and Information Literacy class helps students meet several transfer goals, including:

- Read, analyze, and evaluate sources and information in qualitative, non-fiction texts, including primary and secondary sources.
- Represent quantitative data and information visually through tables, charts, graphs, maps, and infographics.
- Develop logical and valid evidence-based written arguments.
- Communicate a perspective using appropriate media to a targeted audience for a particular situation.
- Strategically select and employ purposeful rhetorical and correct syntactical choices.

Students demonstrate their ability to meet these goals through a series of transfer tasks (Wiggins & McTighe, 2005), including presenting using multimedia tools, writing argumentative essays, designing an infographic, producing a podcast, and creating a vlog series. For example, during the 2019-20 school year, students documented how they adapted to life during the pandemic through a vlog series. They also produced podcasts about a topic of their own research interests including the ethicality of zoos, the meaning of love, and the necessity to design buildings that are more accessible to disabled individuals. In each of these cases, the students applied the knowledge, skills, and understandings that they gained through classroom activities and discussions and transferred them into new contexts.

The next set of courses in the sequence are AP Seminar or Public Speaking, which students complete in 10th grade. Both courses are aimed at preparing students to meet six of the transfer goals, including:

- Plan and conduct sustained research investigations using appropriate tools and media.
- Read, analyze, and evaluate sources and information in qualitative, non-fiction texts, including primary and secondary sources.
- Analyze and interpret quantitative data represented in tables, charts, graphs, maps, and infographics.
- Develop logical and valid evidence-based written arguments.
- Communicate a perspective using appropriate media to a targeted audience for a particular situation.
- Strategically select and employ purposeful rhetorical and correct syntactical choices.

The courses prepare students to meet these goals through a team project and an individual project. In the team project, the students work in small groups to research information about a topic from varying perspectives and then develop a solution or resolution to an issue related to that topic. Each group presents their solution or resolution in a multimedia presentation. For example, during the 2018-19 school year, one group researched the effects of raising the minimum wage in the United States. The five members of the group researched different perspectives regarding raising the minimum wage, each from a different lens or discipline (e.g., political, moral, economic, scientific). Each member of the group wrote a report on the effects of raising the minimum wage from their chosen lens. Then, working as a team, they developed an argument about why and how the minimum wage should be raised. Specifically, they cited evidence of the effect that raising the minimum wage can have on poverty levels and its ability to improve both the mental and physical health of workers. They presented that argument to their peers and responded to questions regarding both their solution and the process by which they came to that solution.

For the individual project, students analyze a series of quantitative data, texts, videos, and other media that have a common theme. Based on this theme, students find relevant and credible research and develop an argument. Their argument must include a solution or resolution to a problem or a conclusion about the theme, which they share in a multimedia presentation. Students must include evidence from both the given source materials, as well as other credible sources. In 2019-20, students identified the theme of happiness in the sources presented to them and examined happiness from a number of different perspectives. One student investigated the genetic influence on happiness and concluded that genetic factors influence people's happiness just as much, if not more than, environmental factors.

Both of these projects required students to conduct a sustained investigation of a topic, read and analyze sources, develop an argument about the topic using evidence gained from their research, and then communicate their arguments both in writing and in a presentation while making appropriate choices to ensure audience engagement and understanding. In order to prepare students for these projects, teachers provided lessons on critical reading of both qualitative and quantitative texts, conducting academic searches for reliable and credible information and evidence, developing an argument, working as a team, and communicating ideas in impactful ways.

Four of the six transfer goals for these 10th grade courses overlap with those in the Media and Information Literacy course. This spiraling of the goals is by design to intentionally give students exposure to the same skills and understandings but using different content. Like the strands of a rope that are woven together multiple times, this repetition makes the connections stronger with each revolution of the spiral. In this way, students deepen their understandings about these transfer

goals (analyzing and interpreting non-fiction texts, developing evidence-based arguments, communicating perspectives for a targeted audience, and employing appropriate rhetorical and syntactical choices) and further develop their skills and the ability to transfer what they have learned to new and novel situations.

The next courses in the series are AP Statistics or Data Analysis, which students take in 11th grade. These courses are focused on the transfer goals of:

- Analyze and interpret quantitative data represented in tables, charts, graphs, maps, and infographics.
- Analyze quantitative data and perform statistical tests on the data to draw conclusions.
- Represent quantitative data and information visually through tables, charts, graphs, maps, and infographics.

The courses share one transfer goal with Media and Information Literacy and one transfer goal with AP Seminar and Public Speaking. They also introduce a new transfer goal for students, related to performing statistical tests, which is also repeated in other courses in the curriculum in order to reinforce and deepen what students learn.

As mentioned above, students analyze and evaluate a variety of sources, including research studies, and study how and why the authors conducted the research in AP Seminar and Public Speaking. Students in these classes examine the author's data, results, findings, and conclusions as they work toward the transfer goal: Analyze and interpret quantitative data represented in tables, charts, graphs, maps, and infographics. While the focus in AP Seminar and Public Speaking is on analyzing and interpreting data collected by others, in AP Statistics, students examine how that data is collected, analyzed, and interpreted in order to teach the research process and methods. Moreover, students design a study of their own, choose an appropriate method (often a survey), collect data, and determine the best way to represent that data (e.g., bar charts, histograms, etc.). In one example in the Fall of 2020 and Spring of 2021, the AP Statistics students observed a group of university faculty on a local college campus as they conducted their research. Students then took the data collected by the researchers, displayed them in new contexts, and drew conclusions from them using the concepts taught in class. With the first-hand experience and knowledge gained in AP Seminar and AP Statistics, students were well-positioned to analyze data and methods from other sources in addition to creating their own methods, studies, and conclusions.

Finally, the Inquiry series culminates in 12th grade with AP Research and Senior Research Project, which share all of the Inquiry transfer goals with AP Seminar and Public Speaking, one goal with Media and Information Literacy (read and analyze qualitative sources), and one with AP Statistics and Data Analysis (analyze and interpret quantitative data). While the students complete activities and tasks related to these goals in each of the classes, the level of complexity of the tasks deepens over time and the outcomes of completing the tasks are different in the research courses. For example, in Media and Information Literacy, students read and analyze sources in order to understand how ideas are communicated, while in AP Seminar and Public Speaking they are analyzed for credible information that can be used as evidence for their arguments. In the Research courses, students read and analyze sources in order to determine the gap in the research (what is and is not known about a topic), which can help them formulate a research question and conduct a study to collect data about their question. Students read and analyze these sources in a deeper and more complex way because they have the skills and understandings developed in the prior courses.

Students also use skills they learned in AP Statistics or Data Analysis when analyzing the data they collected. Rather than collecting and analyzing data in theoretical situations or in contexts created by others, the students are now doing so in authentic contexts of their own creation. They transfer what they have learned to this new situation for the purpose of creating new knowledge.

Additionally, a key difference between the 12th grade courses and the 10th grade courses is in the first transfer goal: Plan and conduct sustained research investigations using appropriate tools and media. Whereas in the 10th grade courses the students conduct research by reading and analyzing materials published by others, in the 12th grade courses, the students plan and conduct their own research. Students begin with an idea or topic of inquiry, conduct a review of the existing literature related to the topic, find a gap in the research, and develop a research question. They then determine a method appropriate for their question, conduct the research, analyze the data, and draw conclusions to answer their research question.

For example, during the 2020-21 school year, one student researched how state elections laws and regulations impacted the turnout of 18–30-year-old voters in the 2012, 2016, and 2020 presidential elections. The student began the process with his interest in political science, and after a review of the research, decided to analyze election laws in the context of voter turnout using information collected by state and local election agencies and exit polling. Specifically, he analyzed voter data from states with liberal election laws and those with more conservative ones. Using techniques learned in AP Statistics and Data Analysis during the prior school year, the student hoped to determine what, if any, relationships exist between voter turnout among 18-30-year-olds and state election laws (the student was still completing the research project at

the time of publication). This entire process takes place over the course of the year with lessons and activities dedicated to each aspect of the research process, so that students are prepared to complete each task. Revisiting some activities from the prior courses helps reinforce the skills and then extend them by creating new situations in which students can use them.

Throughout this series of classes, students are exposed to the same transfer goals and must apply their learnings across multiple disciplines. Students think critically about sources of information in English classes, but also in math and computer science classes. Likewise, they analyze and interpret quantitative data in math and English classes. In this way, the curriculum is designed to develop students who can meet a variety of needs no matter the context.

Scientific Inquiry

Another example of the spiraling of skills and repetition of goals in different classes and across multiple years comes from the Scientific Inquiry competency area. One goal in this competency area is: Create visual representations and/or models of scientific concepts and processes. Students learn skills and knowledge related to this goal and are tasked with applying it in different contexts in a series of classes similar to those addressed above. As was the case above, the series begins in eighth grade with AP Computer Science Principles. Students are tasked with using one of four different types of graphs to display a data set and with drawing conclusions from that graphical distribution. In one project, students rely on computer applications to create the distribution, rather than make it themselves. Prior to creating these data distributions, students analyze a pre-made distribution and draw conclusions about the concept or phenomenon represented in the distribution based on their interpretation of the data. Creating a distribution, such as a histogram, with the online application is fairly simple and only requires the student to decide two components of the entire graph—the bin width and what values are being represented.

However, students revisit the skill of creating visual representations of data and scientific concepts and phenomena later in AP Statistics and Data Analysis in a more intricate, nuanced context, where they build on prior learning and create more complex distributions and interpretations. Students make several decisions about visual design elements and the representation of the data in this course. For example, they are encouraged to use more discipline-specific vocabulary when describing the data. They might use words such as "inclusive" to describe the range of a subgroup in a distribution instead of just assigning a value to a width of a bar on a histogram. Both AP Computer Science Principles and AP Statistics and Data Analysis accomplish the same transfer goal, but the assignments and instructional material used in the classroom provide opportunities for students to demonstrate their learning in contexts appropriate for the content.

Between the computer science course and AP Statistics and Data Analysis, students take at least one (Biology) , sometimes two (e.g., Chemistry, Physics), science courses. These courses build students' knowledge of scientific concepts, processes, models, as well as their skill in creating visual representations of those concepts and processes. Then, students take an additional science course (e.g., Engineering and Design, Forensic Science, AP Environmental Science) in which they deepen their understanding of the scientific concepts and processes and apply what they have learned in novel and more complex situations. Thus, like the Inquiry, Communication, and Data Analytics competency area above, the Scientific Inquiry competency area is designed to encourage students to bring knowledge and skills learned in multiple disciplines together in order to deepen their understanding. With deeper understanding, then, they should be able to meet new challenges presented to them.

Conclusion

With transfer goals shared across all grade levels and multiple disciplines teachers are encouraged to collaborate with each other and develop common tasks that assess various transfer goals. For example, AP Statistics and AP Biology teachers may collaborate on an experiment or hypothesis found in the AP Biology curriculum that also requires the students use confidence intervals as part of their conclusion with the experiment. The goal of the interdisciplinary transfer tasks is to show students how these goals can be met in different contexts and allow students to show mastery of these goals in multiple ways. The Research courses in 12th grade are the capstone to this idea since students draw upon content knowledge and understanding, as well as skills, from throughout their secondary school career to complete the research project.

As the Model Core becomes more fully implemented, different measures will be used to evaluate its effectiveness at preparing students for college and career. For example, using nationally normed standardized tests (e.g., the PSAT, ACT, and SAT) and readiness benchmarks will allow the school to determine how well the redesigned curriculum is preparing students to meet those benchmarks. These assessments will also provide information about Model students' achievement in those assessment areas relative to their peers across the United States. Additionally, the school will survey its graduates

regarding their perceived preparedness for college and career. The school intends to ask graduates about their experiences in college and to what degree they felt prepared or not for college. Interviews also will be conducted to gain a deeper understanding of the effectiveness of the curriculum at preparing students for their post-secondary experiences.

Ultimately, the Model Core is designed to provide students with multiple opportunities and the necessary time to develop the knowledge, skills, and understandings that will prepare them to lead in the future. Educators have a responsibility to ensure that the curriculum appropriately addresses the most critical skills and understandings that will support students in meeting the challenges of the future, even if the exact nature of those challenges is not yet known. The sequence of courses described above is designed to prepare a generation of leaders equipped for the future.

References

Bruner, J. (1960). *The process of education.* The President and Fellows of Harvard College.

Marzano, R. J. (2003). *What works in schools: Translating research into action.* Association for Supervision and Curriculum Development.

McTighe, J. (2015, April 10). *What is a performance task?* Defined Learning. what-is-a-performance-task-part-1-9fa0d99ead3b

Pacino, M. A., Billings, T., Boston, C., & Hunter, D. (2012). Technology communities for digital, global societies. *International Journal of Technology, Knowledge & Society*, 8(5), 39–47.

Vogels, E. A., Perrin, A., Rainie, L., & Anderson, A. (2020, April 30). 53% of *Americans say the internet has been essential during the COVID-19 outbreak*. Pew Research Center. https://www.pewresearch.org/internet/2020/04/30/53-of-americans-say-the-internet-has-been-essential-during-the-covid-19-outbreak/

Wiggins, G., & McTighe, J. (2005). *Understanding by design* (2nd ed.). Association for Supervision and Curriculum Development.

Zhao, Y. (2012). *World class learners: Educating creative and entrepreneurial students*. Corwin.

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Appendices

A - Inquiry, Communication, and Data Analytics.....5 Credits

A1 - Informatics and Media Literary (2 Credits)
Grade 9: Media and Information Literacy
Grade 11: AP Statistics **OR** Data Analysis
A2 - Analysis, Argumentation, and Communication (2 Credits)
Grade 10: AP Seminar **OR** Public Speaking
Grade 12: AP English Language **OR** Business and Technical Communication
A3 - Research Methods and Sustained Inquiry (1 Credit)
Grade 12: AP Research Methods **OR** Senior Research Project

B - Quantitative and Computational Reasoning.....4 Credits

B1 - Mathematics (3 Credits)
Choose one of these options:
Option 1: Algebra I, Geometry, **AND** Algebra II
Option 2: Geometry, Algebra II, **AND** Pre-Calculus
Option 3: Algebra II, Pre-Calculus, **AND** AP Calculus
B2 - Coding and Logic (1 Credit)
AP Computer Science A **OR** AP Computer Science Principles **OR** Coding Principles

C - Scientific Inquiry.....3 Credits

C1 - Life Science (1 Credit)
Grade 9: Biology I
C2 - Natural/Physical Science (1 Credit)
Choose one of these:
AP Physics I, Physics I, **OR** Chemistry I
C3 - Engineering and Applied Laboratory Science (1 Credit)
Choose one of these:
Anatomy, AP Biology, AP Chemistry, AP Environmental Science, AP Physics C, Aviation Science, Forensic Science, Introduction to Engineering and Design, Marine Biology, **OR** approved dual credit course

D - Humanities.....5 Credits

D1 - History and Appreciation of Visual and Performing Arts (1 Credit)
Grade 10: AP Art History **OR** Humanities
D2 - History (2 Credits)
Grade 10: AP World History OR World History
Grade 11: AP U.S. History OR U.S. History
D3 - Literature (2 Credits)
Grade 10: World Masterpieces
Grade 11: Major American Writers

E - Global Communication and Understanding.....3 Credits

E1 - Second Language Proficiency (2 Credits)
TWO **YEARS** of the **SAME** World Language
E2 - Cultural Comparison (1 Credit)
Grade 9: AP Human Geography **OR** AP Comparative Government **OR** Global Issues

F - Civic Engagement, Entrepreneurship, and Financial Literacy.....1 Credit

F1 - Civics and Government (0.5 Credit)
Grade 12: AP U.S. Government & Politics **OR** American Government
F2 - Financial Literacy, Economics, and Entrepreneurship (0.5 Credit)
Grade 12: AP Macroeconomics **OR** Financial Literacy, Economics, & Entrepreneurship

G - Creating, Performing, and Designing.....1 Credit

Choose one of these:
Acting I, AP Art & Design, AP Music Theory, Band, Ceramics, Choir, Creative Writing, Dance, Drama, Fashion Design, Filmmaking & Broadcasting, Guitar, Musical Theatre, Orchestra, Photography & Digital Media, Theatre Design and Technology, Visual Art I, Visual Art II

H - Fitness and Wellness.....1 Credit

Health and Physical Education (1 Credit)
Grade 9: Health and Fitness

Appendix A Model Laboratory School Graduation Requirements

A WORLD-CLASS EDUCATION

Model Laboratory Schools' curricular program of studies provides a world-class education that prepares students for college and career by addressing the following competencies known as *The Model Core.*

Model Laboratory Schools guarantee a world-class education for their K-12 students through a viable curriculum that:

- Provides opportunities for students to develop as **leaders and entrepreneurs**.
- Develops **transferable, transportable skills** through practice with feedback.
- Requires students to think critically, creatively, computationally, and quantitatively.
- Challenges students to develop **creative solutions** to authentic and relevant real-world problems.
- Provides opportunities for students to make cross-curricular and **interdisciplinary connections**.
- Provides opportunities for school-wide and grade-level **shared experiences** and courses.
- Emphasizes persistence through sustained inquiry, **capstone projects**, and presentations.
- Develops strong written and oral **communicators**.
- Facilitates students' abilities to **engineer, design, perform, innovate and create**.
- Promotes participation in **civic activities** as an informed citizen.
- Instills principles of **equity, fairness, and social justice**.
- Fosters community through **service (learning)** and teamwork.
- Fosters individual **physical and emotional well-being**.
- Builds ability to **communicate in a second language** and engage in culturally appropriate interactions.

INQUIRY, COMMUNICATION, AND DATA ANALYTICS

- Plan and conduct sustained research investigations using appropriate tools and media.
- Read, analyze, and evaluate sources and information in qualitative, non-fiction texts including primary and secondary sources.
- Analyze quantitative data and perform statistical tests on the data to draw conclusions.
- Analyze and interpret quantitative data represented in tables, charts, graphs, maps, and infographics.
- Represent quantitative data and information visually through tables, charts, graphs, maps, and infographics.
- Develop logical and valid evidence-based written arguments.
- Communicate a perspective using appropriate media to a targeted audience for a particular situation.
- Strategically select and employ purposeful rhetorical and correct syntactical choices.

QUANTITATIVE AND COMPUTATIONAL REASONING

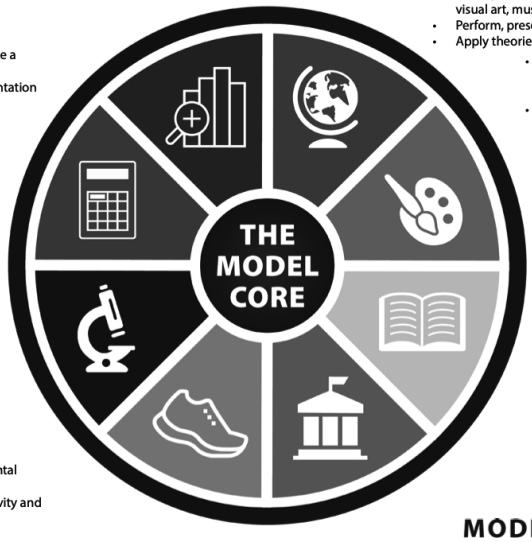
- Analyze a real-world mathematical problem and determine a method and the tools needed for solving it.
- Translate mathematical information from a single representation or across multiple representations.
- Construct viable mathematical arguments.
- Evaluate the reasoning and validity of a mathematical argument or method.
- Identify and make use of structure and patterns in mathematical contexts.
- Attend to precision, using appropriate notation and mathematical conventions.
- Write and implement code by applying logic and rules to achieve outcomes or results.
- Analyze program code to explain the behavior and conditions that produce results in a program.

SCIENTIFIC INQUIRY

- Analyze and explain scientific concepts, processes, and models in real-world contexts.
- Classify and explain phenomena found in real-world contexts.
- Create visual representations and/or models of scientific concepts and processes.

FITNESS AND WELLNESS

- Analyze choices and behavior on fitness, physical and mental health, and emotional wellbeing.
- Participate in activities that promote lifelong physical activity and wellness.



GLOBAL COMMUNICATION AND UNDERSTANDING

- Contextualize and compare perspectives.
- Analyze current events, including through cultural comparisons.
- Draw conclusions about political, social, economic, and geographic developments.
- Analyze geographic patterns and spatial relationships.
- Communicate ideas effectively in written and spoken discourse in a second language to a variety of audiences demonstrating cultural sensitivity and understanding while emulating native speakers.

CREATING, PERFORMING, AND DESIGNING

- Convey an idea, message, or theme through original creations of art (literature, visual art, music, dance, drama).
- Perform, present, or publish works of art (literary, visual art, music, dance, drama).
- Apply theories and principles when creating, performing, or designing.
  - Apply recursive processes that emphasize practice and persistence and incorporate collaboration, iteration, critique, reflection, and revision.
- Design innovative and creative solutions (products, algorithms, program code, lighting designs, stage sets) that solve a problem or achieve a purpose.

HUMANITIES

- Read/View/Listen to, analyze, and interpret a work of art (literature, music, visual art, drama, dance).
- Explain the historical and cultural significance of a work of art (literature, visual art, music, dance, drama.)
- Draw conclusions about historical and social developments.

CIVIC ENGAGEMENT, ENTREPRENEURSHIP, AND FINANCIAL LITERACY

- Analyze and evaluate economic, financial, and consumer options and choices.
- Apply political and economic theories, perspectives, and models in authentic contexts in order to make sound economic and financial decisions.
- Apply effective interpersonal skills appropriate for the social or professional context.

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MODEL LABORATORY SCHOOLS
AT EASTERN KENTUCKY UNIVERSITY

Appendix B, The Model Core

"Toddlers Development of Friendships"

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Are you my Friend? Toddlers' Development of Friendships

Amy: *"Who is your best friend?"*
Beth: *"Orion is my best friend."*
Amy: *"Why is Orion your best friend?"*
Beth: *"Hmm ...let me think. She's nice, and I like to play with her."*
Amy: *"What's your favorite thing to play with Orion?"*
Beth: *"I like to go to her house and play with her lip gloss, and I like to go to the Key Park."*
Amy: *"Do you have any other best friends at school?"*
Beth: *"Jack and Stella are my best friends because we play blocks."*

This conversation between a toddler and her teacher represents one example of how toddlers think of their friends. Making friends is very important to children's well-being (Buysse, Goldman, & Skinner, 2003; Hartup & Stevens, 1999; Rubin, Fredstrom & Bowker, 2008; Shin, 2010; Witter, 2012). The development of toddler friendships is similar to adult friendships in that toddlers choose with whom they desire to play. Young toddlers are "from about a year old to two years" (Gonzalez-Mena & Eyer, 2012, p. xxi), and older toddlers are those aged two years to 36 months. Numerous studies show that children begin to form friendships with their peers as young as 12 to 18 months (Engdahl, 2012; Engeler, 1995; McGaha, Cummings, Lippard, & Dallas, 2011; Shin, 2014). Many toddlers begin to form special bonds with their peers when regularly given a wide choice of playmates of similar age. Signs of toddler friendships include: showing a preference for a certain child, exhibiting happiness when greeting each other, and mimicking the other's actions (Engeler, 1995; Witter, 2012).

Friendships are crucial for toddlers at the beginning of schooling (Church, 2003). Since starting school can be a stressful time for them, having friends may help ease the difficulty of starting school, and toddlers start to experience the joy of being accepted (Danby, et al., 2012). Friends provide social support which is more than just being fun playmates, and toddlers can learn social and emotional skills such as empathy and perspective taking through interacting with friends (Ferrer-Chancy & Fugate, 2007). This includes how to cooperate, how to solve problems, and how to express one's self. Toddlers, between the ages of 24 and 36 months, are inclined to exhibit more positive behaviors than negative behaviors towards peers in their play (Ferrer-Chancy & Fugate, 2007).

A common activity that takes place in the development of toddler friendships is parallel play (Gonzalz-Mena, 2014). This transpires when two children are sitting beside one another, but do not actually play with each other (Honig, 2007). Two children may be sitting together at a table coloring, and when one leaves the table to begin another activity, the other child does the same. Other indications of early development of toddler friendships include: using the same colored crayon to draw similar pictures, banging instruments simultaneously, and pushing two matching baby strollers across the room. These imitations are how toddlers express that they like being together (Engeler, 1995; Witter, 2012).

Early friendships have more significant impact on the development of cognitive and social skills than the interactions with adults (Dunn, 2003) because the way that children build friendships and deal with conflicts is based on age-appropriate cognitive abilities. When children play together in a block center all day, they decide who can be a driver or who is a passenger. Thus, it is easier for them to build cooperative play and to understand each other. (Howes, 2009).

The organization of this article is as follows: We first briefly review the importance of friendships for toddlers. We next describe some simple activities that teachers and family members can implement in toddler classrooms and at home to promote the development of toddlers' friendships. We will also describe the teacher's role in supporting toddlers' friendships as toddlers need teachers' help in these areas.

The Importance of Toddlers' Friendships

Friendships can be defined as a "mutual relationship involving companionship, sharing, understanding of thoughts and feelings, and caring for and comforting one another in times of need" (Berk, 2002, p.377). The three components of friendships consist of: the skillful ability to interact, mutual preferences, and mutual satisfaction (Howes & Mueller, 1980). Interaction skill means the ability to engage in complementary and joint peer play (Howes, 1980). It is mandatory in this level of interaction that one partner be the complement of the other. Mutual preference is defined as a high probability that a dyadic interaction would trail a social initiation by either peer. Mutual enjoyment refers to the ability to engage in positive affective changes, which produces positive emotions for both peers. Although toddlers are considered to be egocentric, friends provide social and emotional support which is more than just being fun playmates. When a toddler is able to move himself from the emotional place of 'it's all about me' to 'we are friends' he is showing positive social and emotional growth and development.

Teachers play a vital role in their students' social development (Copple & Bredcamp, 2009; Morrison, 2015; Witter, 2012), and toddlers need adults who work closely in preparing them to interact effectively with peers. Adults must build respectful and loving relationships with toddlers by ensuring that they believe in them. This adult-child relationship sets the foundation for future relationships, including friendships. It helps children develop the trust and self-assurance needed to meet peers (Ferrer-Chancy & Fugate, 2007; Witter, 2012). Children also form friendships with adults who are neighbors, caregivers, church friends, and instructors in extracurricular activities such as dance, gymnastics, and music, to name just a few. These friendships help children form a sense of a larger community in which they actively participate,

Children's positive relationships with peers can support their learning (Copple & Bredekamp, 2009), and they need to begin establishing friendships in early childhood (Buysse, Goldman, & Skinner, 2002; Church, 2003; Coople & Bredkamp, 2009; Witter, 2012). These friendships build important frameworks to learn and put into practice skills necessary for children's emotional, cognitive, social, and communicative development (Guralnick, Neville, Hammond, & Connor, 2007; Pasnack, Perez, & Romero, 2009; Witter, 2012). Such friendships promote children's sense of safety and help them feel like they belong. Friendships can also reduce stress for toddlers (Geisthardt, Brotherson, & Cook, 2002; Overton & Raush, 2002) and adds to their overall quality of life (Overton & Rausch, 2002; Witter, 2012).

By letting them play with familiar playmates, children can form friendships easier (Witter, 2012). "Keeping a group of children together as they develop and move from one room to another in a program" supports such friendships (Witter, 2012, p. 22). Keeping the same teacher with the children as they move to another room also enhances toddlers' development of friendships.

Activities That Promote Toddlers' Friendships

There are many developmentally appropriate activities that teachers and other helping adults can offer to toddlers to form friendships. We suggest the following simple and enjoyable activities for toddlers: play dates; art; music and dance; cooking; and reading books. All of these activities are implemented in the classroom at laboratory schools, and children's comments are included.

Play Dates: Scheduling play dates for toddlers promotes friendships as such dates enhance toddlers' give-and-take relationships (Egeler, 1995). Teachers and other helping adults need to provide several of the same kinds of toys in order for them to play together (Gonzalez-Mena, 2014). Young children's object-related behaviors (e.g., touching the peer's object without grasping and pulling back") precipitate peer interactions (Williams, Ontai, & Mastergeorge, 2009). Teachers and other helping adults should step aside and let toddlers interact with one another and intercede only when necessary. At one Laboratory school, two-year-old Ken has enjoyed playing with Satoshi who recently came to the US from Japan and did not speak English. Although they did not communicate with each other, Ken always sat next to Satoshi while playing with his trucks. Satoshi's mother was worried that her son's inability to speak English might cause him to not want to come to school. Based on the teacher's suggestions, both Ken's and Satoshi's parents scheduled the children's play date. After their first play date, Satoshi's mother said to the teacher, "Thank you for your suggestions about play dates. My son and Ken played, played, and played in the sandbox although they did not speak to each other. They just pointed to toys that they had and smiled at each other. It was amazing!" Ken's mother also reported, "Ken loves his new friend and asked me to invite Satoshi to play again."

Play dates can also include virtual play dates. During the recent pandemic children stayed in touch with their friends via social media. Many young children did not comprehend that their daily routine of early childhood program attendance was abruptly halted. Dedicated teachers and caregivers organized class meetings on Zoom or FaceTime. The sessions were patterned in the same way circle time would be conducted. The children got to see their friends and teachers in familiar ways. This is also a good way to stay in contact with a friend who may be ill or away on vacation or visiting relatives.

Art: Art is an excellent activity for toddlers (Witter, 2012) where teachers use paper and crayons as a way to encourage toddlers to interact with their peers. Teachers can facilitate their interactions by asking questions about their artwork. Teachers also can have children explain their artwork to each other while they are drawing, and then, exhibit the artwork and commend children for playing well together (Zinski, 2014; Witter, 2012). Teachers can offer variety of art materials, including different colors, textures, and shapes, to create form (Morrison, 2015). At the Laboratory school toddlers engage in art activities every day because teachers value and believe that children can express their feelings, thoughts, and ideas through various art activities. At one easel, a toddler painted her rainbows using red, yellow, and blue, saying, "I gonna make my rainbow like cupcake and stuff." By hearing her comments, another toddler started painting next to her, saying, "I want some cupcakes too." Although they did not speak to each other, the two toddlers engaged in easel painting for a long time by looking at each other's artwork.

Music and dance: Toddlers enjoy music and dancing, and such activities are beneficial to forming toddlers' friendships (Center for, 2006) as brain research indicates the use of music and dance encourages children's development in all areas (Morrison, 2015). This can be as simple as playing favorite songs and encouraging them to dance, sing, and giggle. Teachers could help children make their own silly songs to share with peers. Teachers can teach toddlers songs about friendships and have them hold hands while singing. Also, active play activities such as 'run and chase' and 'hide and seek' are related to toddlers' development of friendships **(**Gonzalez-Mena, 2014; Howes, 1988). Because toddlers enjoy moving around (Coople & Bredekamp, 2009; Gonzalez-Mena, 2014; Morrison, 2015), teachers can offer them opportunities to play together with equipment that supports their large motor skills, such as various kinds of balls, short lofts with ladders, and slides (Witter, 2012). At the laboratory school, toddlers enjoy marching around the school, holding their favorite toys while children and teachers sing a song. One older toddler cried out, "Um, rock and roll!" These toddlers enjoy visiting younger toddlers' classrooms while marching.

Cooking: Cooking activities for toddlers are becoming more important because current health risks such as obesity have caused parents, family members, and teachers to reflect on eating habits of young children (Izumi-Taylor, Boes, Young, & Laws, 2020). Because their eating habits are learned at an early age, children should be exposed to various foods and tastes while they are young. Healthy eating experiences from the start set the stage for children's choice of food in later years. Although many teachers avoid cooking activities for toddlers since it could be messy (Izumi-Taylor et al., 2020; Izumi-Taylor & Rike, 2011), toddlers can learn to cook with a little help from their teachers. There are many additional benefits of engaging toddlers in cooking activities (Izumi-Taylor & Rike, 2011; Matricardi & McLarty, 2005), including social-emotional and cognitive development. Especially, social interactions involved when preparing food can enhance toddlers' development of friendships (Izumi-Taylor et al., 2020).

At this laboratory school both younger and older toddlers engage in cooking activities at least once a month, and toddlers and teachers read a book regarding food before they participate. One example is to mix and create children's own trail mix using crackers, cereals, and dried fruits since this does not require recipes or complex cooking procedures (Izumi-Taylor & Rikes, 2011). Younger toddlers enjoy and participate in mixing the ingredients while identifying each item. When engaging in this activity, children spread and scoop ingredients, and they develop small motor skills and enhance coordination. Two boys said to their teacher, "Me want more!" and "Me and my mom make this at home." Another example that older toddlers enjoy at this laboratory school is the tea party. The veteran teacher has collected many children's tea sets from various cultures. She sets out the cups, saucers, teapots, tablecloths, napkins, and the tea cakes which the children had made and baked. Then she gathers a small group of 3 or 4 children to the table. She explains that sharing tea is an expression of friendship for many children around the world. She may show pictures or read a book from a particular culture. In many cultures the sharing of tea can range from a formal ceremony to a casual gathering of friends for conversation and camaraderie. This provides children with the enrichment of cultural exchanges. One child drank her tea, finishing up with a hearty, "Aaaaaahhhhhhh!"

Books: Reading high quality books is one of the best ways for teachers to enhance toddlers' social and emotional development (Morrison, 2015). Early childhood teachers already use books and stories throughout their curricula; therefore, this strategy will be easily implemented in classrooms. According to Jalongo (2004), literature can promote four kinds of learning fundamental to young children's learning and development described by Katz

(1988): knowledge, skills, dispositions, and feelings. Reading books to toddlers can promote all areas of their development (Morrison, 2015), including their feelings for peers. Books related to children's social and emotional development can promote meaningful conversations and activities that support toddlers' friendships. A teacher may ask children how they feel when someone grabs their books and to discuss their feelings (Church, 2003).

In the laboratory school, toddlers and teachers read books all day long, and toddlers have easy access to a variety of high-quality books. On this day, the teacher of toddlers read the book entitled "*Yoko*" by Wells (1998), and she asked the toddlers what they thought about how Yoko felt when everybody made fun of her lunch (Church, 2003). This is a story of a kitty from Japan who enjoys and brings sushi for lunch to school, but her classmates make fun of her food because they do not know about sushi. Then, the teacher asked the toddlers which words they should use when they hurt others' feelings, and what they can do to show respect to our friends (Danby, Thompson, Theobald, & Thorpe, 2012). One older toddler said, "I yike sushi! We eat it all the time." Another one asked, "What is sushi?"

The Role of the Teacher in Developing Toddler Friendships

Teachers can teach children various social skills by being good role models (Ferrer-Chancy & Fugate, 2007; Gonzalez-Mena, 2014; Morrison, 2015; Witter, 2012). Children are constantly watching adults and will begin mimicking their actions. Teaching toddlers how to meet and communicate with people, how to help others and ask favors, and how to tell stories and jokes will foster friendships. Teachers can teach children how to appropriately win and lose, to apologize, and to accept apologies.

Teachers also can support the development of toddler friendships by providing activities that help them recognize various social skills and by helping them develop positive social skills (Morrison, 2015; Witter, 2012). Likewise, allowing a child to work together with adults and children in successful and proper ways, presenting activities that advance appropriate skills, and providing needed support also are related to children's development of prosocial behavior (Johnson et al., 2000; Wardle, 2003). Teachers may provide group time for toddlers to work together to enhance their sense of belonging (DeVries & Zan, 2012; Gonzalez-Mena, 2014; Morrison, 2015). Children are less likely to wander and more likely to engage in interesting activities provided by teachers. They may work cooperatively with peers instead of being alone (Howes, Phillips, & Whitebook, 1992). Being part of a group helps support toddlers' development of self-esteem and self-control. Children can develop warm relationships through establishing basic trust and self-confidence by going out and meeting others (Ferrer-Chancy & Fugate 2007).

Toddlers who are more emotionally secure with their teachers are more proficient in their relationships with peers (Howes, Phillips, & Whitebook, 1992; Marian, 2011; Oppenheim, Sagi, & Lamb, 1988; Pianta & Nimetz, 1991). Creating child-centered surroundings that cultivate positive relationships among peers is important (Sandall et al., 2005), and in fostering toddlers' friendships, teachers need to offer flexible daily schedules that allow opportunities for children to "follow their interests, play with preferred playmates, and build relationships with peers" (Buysse, Goldman, & Skinner, 2003, p. 496).

Conclusion

Toddlers are capable of making friends when they have warm support from their teachers, and with teachers' caring and loving guidance, toddlers can enhance their prosocial behavior to make good friends and enjoy their early childhood years. Through teachers' support, they will be able to learn to interact positively with others and have life-long friends.

To promote toddlers' friendships, having them play with familiar playmates and letting a group of toddlers to move from one classroom to another in a program can enhance the development of friendships. When toddlers keep the same teachers as they move to another room, it also can support toddlers' friendships. Toddlers' development of friendships is learned in the early years, and teachers' support is critical.

Through participating in many activities mentioned above toddlers can develop their sense of accomplishment, their self-esteem, as well as their concepts of friendships. These activities can also support children's social, emotional, physical, cognitive, and language skills. To plan meaningful activities for toddlers, teachers must know children's developmental levels.

References

Berk, L. (2002). *Infants, children, and adolescents.* Boston, MA: Allyn & Bacon.

Buysse, V., Goldman, B. D., & Skinner, M. L. (2002). Setting effects on friendship formation among young children with and without disabilities. *Exceptional Children, 68*(4), 503-517.

Buysse, V., Goldman, B. D., & Skinner, M. L. (2003). Friendship formation in inclusive early classrooms: What is the teacher's role? *Early Childhood Research Quarterly,* 18, 485-501.

Center for Community Inclusion & Disability Studies. (2006). *Growing ideas*. Retrieved from http://ccids.umaine.edu/resources/ec-growingideas/

Church, E. B. (2003). Will I find a friend? *Early Childhood Today*, *18*(2), 31-33.

Coople, C., & Bredekamp, S. (2009). *Developmentally appropriate practice in early childhood programs: Serving children from birth to age 8* (3rd ed.). Washington, DC: NAEYC.

Danby, S., Thompson, C., Theobald, M., & Thorpe, K. (2012). Children's strategies for making friends when starting school. *Australasian Journal of Early Childhood, 37*(2), 63-71.

DeVries, R., & Zan, B. (2012). *Moral classrooms, moral children: Creating a constructivis atmosphere in early education*. New York: Teachers College Press.

Dunn, J. (2003). Emotional development in early childhood: A social relationship perspective. *Handbook of affective sciences*, 332-346.

Engdahl, I. (2012). Doing friendship during the second year of life in a Swedish preschool.

European Early Childhood Education Research Journal, 20(1), 83-98.

Engeler, A. (1995). Friends from the start. *Parents*, 70, 60-62.

Ferrer-Chancy, M; Fugate, A. (2007). The importance of friendship for school-age children. *Department of Family, Youth, and Community Sciences, Florida Cooperative Extension Service*, 1-3.

Geisthardt, C., Brotherson, M., & Cook, C. (2002). Friendships of children with disabilities in the home environment. *Education and Training in Mental Retardation and Developmental Disabilities, 37*(3), 235-252.

Gonzalez-Mena, J. (2014). *Foundations of early childhood education: Teaching children in a diverse society* (6th ed.). New York: The McGraw-Hill.

Gonzalez-Mena, J., & Eyer, D. (2012). *Infants, toddlers, and caregivers: A curriculum of respectful, relationship-based care and education* (7th ed.). NY: McGraw-Hill.

Guralnick, M., Neville, B., Hammond, A., & Connor, R. (2007). The friendships of youngchildren with developmental delays: A longitudinal analysis. *Journal of Applied Developmental Psychology, 28*(1), 64-79.

Hartup, W. W., & Stevens, N. (1999). Friendships and adaptation across the life span. *Current Directions in Psychological Science*, 8 (3), 76-79.

Honig, A. S. (2007). Ten power boosts for children's early learning. *Young Children*, *62*(5), 72-78.

Howes, C. (2009). Friendship in early childhood. *Handbook of peer interactions, relationships, and groups*, 180-194.

Howes, C. (1988). Peer interactions of young children. *Monographs of the Society for Research in Child Development,* 217(53), 1-92.

Howes, C. (1980). Peer play scale as an index of complexity of peer interaction. *Developmental Psychology*, 16, 371-372.

Howes, C., & Mueller, D. (1980). Early peer friendships: Their significance for development. In W. Spiel (Ed.), *The Psychology of the Twentieth Century*. Zurich: Kindler.

Howes, C., Phillips, D. A., & Whitebook, M. (1992). Thresholds of quality: Implications for the social development of children in center-based childcare. *Child Development*, 63, 449-460.

Katz, L. (1988). *Early childhood education: What research tells us* (No. 280). Phi Delta Kappa. International Incorporated.

Izumi-Taylor, S., Boes, K., Young, C., & Laws, A. (2020). Toddlers can enjoy food preparation and cooking: Connecting food activities with reading children's books. *International Journal of Laboratory Schools*, 10(1), 29-34.

Izumi-Taylor, S., & Rike, C. (2011). Prepare healthy foods with toddlers. *Dimensions of Early Childhood*, 39(3), 27-33.

Jalongo, M. (2004). *Young children and picture books*. Washington, DC: NAEYC.

Johnson, C., Ironsmith, M., Snow, C., & Poteat, G. (2000). Peer acceptance and social adjustment in preschool and kindergarten. *Early Childhood Education Journal, 27* (4), 207-212.

Matricardi, J., &McLarty, J. (2005). *Cooking activities A to Z*. NY: Thomson.

Marian, M. (2011). *Guidance of young children* (2nd ed.). Upper Saddle River, NJ: Pearson.

McGaha, C., Cummings, R., Lippard, B., & Dallus, K. (2011). Relationship building: Infants, toddlers, and 2-year-olds. *Early Childhood Research & Practice*, 13(1), 1-2.

Morrison, G. (2015). *Early childhood education today* (13th ed.). Upper Saddle River, NJ: Pearson.

Oppenheim, D., Sagi, A., & Lamb, M. (1988). Infant-adult attachments on the kibbutz and their relation to socio-emotional development four years later. *Developmental Psychology*, 24, 427-433.

Overton, S., & Rausch, J. (2002). Peer relationships as support for children with disabilities: An analysis of mothers' goals and indicators for friendship. *Focus on Autism and Other Developmental Disabilities, 17*(1), 11-29.

Pasnack, R., Perez, K., & Romero, S. (2009). Encouraging friendships in preschool classrooms. *NHS DIALOG*, 12(4), 342-346.

Pianta, R. C., & Nimetz, S. L. (1991). Relationships between children and teachers: Associations with classrooms and home behavior. *Journal of Applied Developmental Psychology*, 12, 379-393.

Rubin, K., Fredstrom, B., & Bowker, J. (2008). Future directions in friendships in childhood and early adolescence. *Social Development,* 17(4), 1086-1096.

Sandall, S., Hemmeter, M., Smith, B., & McLean, M. (2005). *DEC recommended practices: A comprehensive guide for practical application.* Longmont, CO: Sopris West.

Shin, M. (2010). Peeking at the relationship world of infant friends and caregivers. *Journal of Early Childhood Research,* 8(3), 294-302.

Wardle, F. (2003). *Introduction to early childhood education: A multidimensional approach. to child-centered care and learning.* Boston, MA: Pearson Education, Inc.

Wells, R. (1998). *Yoko.* NY: Scholastic. Williams, S., Ontai, L., & Mastergeorge, A. (2009). The development of peer interactions infancy: Exploring the dyadic processes. *Social Development,* 19(2), 348-368.

Witter, D. (2012). The wonder and complexity of infant and toddler peer relationships, *Young Children, 67(4), 16-25.*

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A Laboratory School's Public Purpose: Transforming Education through Natural Curiosity

Danielle Marcoux-Hunter, Rosa Na, and Brenda Simon

NATURAL CURIOSITY AT THE DR. ERIC JACKMAN INSTITUTE OF CHILD STUDY LABORATORY SCHOOL, ONTARIO INSTITUTE FOR STUDIES IN EDUCATION, UNIVERSITY OF TORONTO

Natural Curiosity in a Virtual World

As the world contemplates a shift to a new normal, it appears that outdoor education is finally getting its day in the sun. Worldwide the evidence is mounting that being outdoors poses a lower risk for contracting COVID-19, for adults and children alike, potentially increasing everyone's commitment to spending school-time outside. Ample studies have demonstrated that the outdoors is beneficial to physical and mental health, reducing feelings of isolation, increasing vital physical activity, helping to regulate stress, strengthening the immune system, and forming a lasting bond with nature in later years. Outdoor education, however, is not a new idea; it is strongly aligned with what many Indigenous peoples in Canada and Indigenous nations across the world have believed since time immemorial and continue to practice through living in reciprocity with the natural world (Anderson, Chiarotto & Comay, 2017). As schools explore promising ideas to transition from surviving to thriving, outdoor learning has become an obvious choice. To make this transition, educators across North America have looked to Natural Curiosity, an environmental education program based at the Dr. Eric Jackman Institute of Child Study Laboratory School, for support. Through its distinguished four-branch framework for environmental inquiry through an Indigenous lens, Natural Curiosity offers a transformative pedagogical approach and solution for educators seeking to effectively and sensitively integrate inquiry, experiential learning and Indigenous perspectives into a new and better normal that "breathes with the world".

What is Natural Curiosity?

Launched in 2011 by the Dr. Eric Jackman Institute of Child Study Laboratory School (JICS), an internationally recognized K-6 school that is part of the Ontario Institute for Studies in Education at University of Toronto, Natural Curiosity (NC) published the first edition of its resource, *Natural Curiosity* (Chiaratto, 2011) which introduced a four-branch framework for environmental inquiry that invites students' interests, questions, ideas, and experiences of the world – their natural curiosity – to shape the learning process. Over 20,000 copies of this resource were distributed, demonstrating NC's value as the only Canadian resource that is designed to support the "how" of learning over the "what" of teaching. The first edition found common ground with Indigenous values in important ways, and reflected an awakening respect for Indigenous knowledge everywhere. One Anishinaabe Elder and retired elementary teacher, Wahgeh Giizhigo Migizi Kwe (Eileen "Sam" Conroy) said, "I cried when I read it. I said to myself, they're finally starting to get it!"

Natural Curiosity 2nd Edition, A Mentor Text

JICS is the only independent school in Canada with a mandate to improve public education through innovation and sharing of exemplary teaching practices and research in education. As Indigenous education became mandatory across Canada in response to Truth and Reconciliation, NC undertook a revision of its well-established resource in order to authentically respond to this call in collaboration with Indigenous educators and knowledge keepers from across Turtle Island. NC2 is a product of the belief that "reconciliation will never happen unless we are also reconciled with the Earth" (TRC Final Report, 2015), a perspective echoed by Indigenous voices all over the world.

Looking back at the first edition, the NC team realized that it was not enough to simply layer an Indigenous perspective on their own fixed understanding of environmental education and practice. In relationship with Indigenous educators, NC embarked on a process of rethinking what was most important and relevant about its philosophy of education. Sharing this process of professional inquiry and reflection remains an integral part of how NC provides guidance to Canadian educators who are often tentative about how to respectfully integrate Indigenous perspectives and content into their teaching practice. This kind of sharing is also the reason why NC2 is popularly adopted as a course text across a wide breadth of teacher education courses.

In 2015, NC began a 3-year project to reevaluate its existing mission in light of unequivocal recommendations by the Truth and Reconciliation Commission of Canada to situate Indigenous perspectives into the heart of Canadian education, most notably in connection with environmental issues. As the knowledge dissemination arm of JICS, NC engaged in a process of bringing Indigenous perspectives into its existing framework through extensive consultation from Indigenous advisors across Turtle Island. NC is especially grateful to the Elders, educators, and children at the Johnny Therriault School in Aroland First Nation for their support and advice. With further guidance from a national Indigenous Education Advisory Committee, NC was re-written by Dr. Julie Comay with the inclusion of an Indigenous lens articulated by Doug Anderson (Bungee/Metis). The Indigenous lens in *Natural Curiosity 2nd Edition* (NC2) represents a cross-cultural encounter in which ongoing dialogue and evolution of practice are explicit (Anderson, Chiarotto & Comay, 2017). This 300-page document is a treasure trove of philosophy and best practices, based on the experience and research of the JICS Lab School, and enriched through diverse accounts from public school educators across the province, who have integrated the Natural Curiosity pedagogy into practice.

Since the publication of NC2 in 2018, over 9,100 copies have sold across Turtle Island. NC2 has gained endorsements from leading Indigenous academics and educators and has been adopted as a course reading for over 30 universities and colleges. Numerous Canadian school boards and schools continue to use NC2 as a professional learning text to guide them towards an authentic process of Truth and Reconciliation. NC has directly engaged more than 13,000 educators to-date through in-person and virtual workshops, webinars, and conferences. NC's message continues to spread through professional development workshops in collaboration with schools, school boards, guest speakers in higher education, as well as the sharing of free online supplementary resources.

NC2 remains one of few Canadian resources praised by practitioners for its authentic examples of inquiry-based teaching and learning with an Indigenous lens. An endorsement from David Sobel, Senior Faculty, Education Department, Antioch University New England states:

> "I must admit to having a case of Canadian envy, and the second edition of Natural Curiosity is a good example of why I feel this way. There aren't any education resources like Natural Curiosity in the United States. The wedding of theory and practice, the case studies of real live classroom curriculum, the vibrancy of childrens' and teachers' voices about their environmental work– it's compelling and exciting. And the integration of Indigenous perspectives as part of the warp of the fabric of environmental inquiry makes the whole endeavor deeply equitable and just. If I teach my Place-based Education course again, this book will play a leading role" (Anderson, Chiarotto & Comay, 2017, unnumbered p. ii).

Fifteen educator stories in the book describe the experiences of educators teaching in inner-city public schools, First Nation schools, and alternative schools, all implementing the NC2 pedagogy in their own ways. Taken together, these stories provide evocative narratives for sharing professional experience, demonstrating the possibility of accessing natural curiosity in diverse settings. By showing how environmental inquiry can transform both the teacher's practice and the students' experience in diverse classrooms, NC2 empowers educators of varying experience levels to apply this approach in their own contexts. The NC Newsletter, which reaches over 5,000 readers on a monthly basis, supplements this effort, inviting new educators to contribute their stories to our collective experience. NC also regularly engages with educators through social media by sharing their voices and experiences with over 12,000 subscribers.

From On-the-Ground to Virtual Dissemination

Prior to the pandemic, the NC team of two presented over 75 workshops at educational gatherings over the last two years. NC's conference workshops are regularly attended not only by classroom educators, but also school board consultants and environmental education nonprofit professionals looking to incorporate Indigenous perspectives into their programs. NC workshops are also sought out by Indigenous educators and First Nations schools interested in bringing the environmental inquiry framework into their professional learning. NC is always eager to engage in humbling collaborations where NC shares and learns from these communities in reciprocity.

NC's online efforts are increasingly relevant during this time when we are challenged to discover new ways of communicating and learning while physically distancing ourselves from one another. In the summer of 2020, NC responded to the COVID-19 crisis by launching a dynamic menu of new online professional learning opportunities. "Natural Curiosity in the New Normal", a four-part conversation about getting outside and staying outside amid COVID-19, was attended by 800 educators. This webinar series invited educators to slow down and embrace the natural world as co-teacher and highlighted an Indigenous lens on the

current crisis in education, with help from various Indigenous and non-Indigenous partners. It was viewed by educators all across Turtle Island, as far north as Nunavut and Northwest Territories, and as far south as Arizona, Hawaii and California. Building on the 2020 series, NC's 2021 monthly webinar series continues to invite exemplary educators in the field of environmental and Indigenous education to share their experiences and stories in community, and further unpack the principles and practices laid out in NC2. Educators from the Dr. Eric Jackman Institute of Child Study Laboratory School also play an active role in the now-virtual dissemination of Natural Curiosity professional learning.

In light of COVID-19, NC simultaneously launched an online coaching program, its newest professional learning offering. This program was designed in response to the findings from NC's 2019 advisory meeting, attended by diverse partners, Indigenous advisors, and educational thinkers to contemplate further directions. This conversation revealed a number of fear-based strategies which operate as barriers to educator confidence and quality of education overall, and inspired the NC team to develop an approach to professional learning that explicitly addresses these fears and supports educators in developing the capacity to more confidently bring the NC pedagogy into practice. Engaging educators from across the country, this new NC program provides coaching and mentorship for educators seeking to move deeper into their NC teaching practice, in a safe online space for open conversation, community and collegial friendship. Taking place once a month for two hours, these professional learning sessions are facilitated by an experienced NC coach, who models a collaborative inquiry approach in the design and facilitation of each session to reflect the learning goals and needs of each group. The Research Ethics Board at the University of Toronto has approved "Engaging Natural Curiosity: Online Coaching for Transformative Teaching in Environmental Inquiry and Indigenous Perspectives", a research project that will document and assess the participating educators' developing narratives about their teaching practice and describe the pathways along which they evolve through their participation in the coaching program. It is plausible that professional development in this area will be most successful when it authentically incorporates the very principles it is aiming to promote.

In this year of COVID isolation and uncertainty in education, NC directly engaged more than 2,500 educators, Indigenous partners, schools, early childhood centres, and post-secondary institutions through 50+ virtual workshops and coaching sessions – all organized and facilitated by a modest but growing team of three. Many of these virtual workshops were planned and facilitated in partnership with school boards across Canada, and in collaboration with Indigenous and Outdoor Education Leads. NC continues to engage locally specific Indigenous partners wherever possible, and has provided honorariums for the invaluable contributions these partnerships bring to the program.

Moving Towards Sustainability, and Breathing with The World

Now in its 12th year, NC is uniquely known and valued by North American educators for effectively bridging a progressive approach towards inquiry-based and student-driven environmental education with Indigenous ways of learning that have existed on Turtle Island long before formal schooling. By placing emphasis on the educational processes needed to cultivate a lasting reciprocal relationship between all children and the natural world, NC2 challenges conventional notions and practices which emphasize human stewardship and protection of nature. Instead, by promoting Land as co-teacher and working collaboratively with Indigenous educators, NC actively brings Indigenous perspectives into diverse educational settings and advances the goals of environmental education to reach the broader education system.

In a keynote address at the launch of NC2, Niigaanwewidam James Sinclair (St. Peter's/Little Peguis), Professor in Native Studies University of Manitoba, described the book as "revolutionary," noting that Indigenous perspectives "used to exist in the children's literature section, or fantasy, or fiction. And now, we exist in classrooms. That kind of revolutionary change can truly change the past 150 years and the path forward" (2018). Deborah McGregor, Associate Professor and Canada Research Chair in Indigenous Environmental Justice at York University, echoes Dr. Sinclair when she remarks that "the greatest strength of this edition is the care taken to ensure that Indigenous peoples, along with their knowledges and pedagogies are understood as contemporary and that they have important contributions to make to environmental education ... *Natural Curiosity* takes the important step of highlighting broader societal obligations such as those laid out by the Truth and Reconciliation Commission" (Anderson, Chiarotto & Comay, 2017, unnumbered p. ii). Taking these powerful statements to the heart of its mission, NC takes a unique stand at the intersection of environmental and Indigenous education, arguing that addressing Indigenous issues and content are not the most compelling reasons for exploring Indigenous perspectives in education; instead, "the greatest opportunities lie beyond cross-cultural awareness and involve profound challenges to how we learn and how we live" (Anderson, Chiarotto & Comay, 2017).

Since its inception, NC has taken every opportunity

to engage North American educators in transformative environmental education. Despite the immense disruption the pandemic has caused in education systems, it has also offered the opportunity for educators and students around the world to maximize outdoor education as a safer alternative to the classroom, and in turn see and feel the benefits of taking learners outdoors. NC will continue to thoughtfully and skillfully advocate for outdoor education. In the new decade, NC is committed to helping future generations "breathe with the world", supporting educators with modelling relationship and reciprocity for their students, and for Mother Earth, which supports us all.

References

Anderson, D., Chiarotto, L., and Comay, J. (2017). *Natural curiosity 2nd edition: A resource for educators : the importance of Indigenous perspectives in children's environmental inquiry*. Toronto, Ont.: The Laboratory School, Dr. Eric Jackman Institute of Child Study, Ontario Institute for Studies in Education, University of Toronto.

Chiarotto, L. (2011). Natural curiosity: A resource for teachers: building children's understanding of the world through environmental inquiry. Toronto, Ont.: The Laboratory School at the Dr. Eric Jackman Institute of Child Study, Ontario Institute for Studies in Education, University of Toronto.

Sinclair, N.J. (2018, March 1). Keynote Address [Launch of Natural Curiosity 2nd Edition]. 2018, Toronto, ON, Canada. https://www.youtube.com/watch?v=p2qvyepEwDA&list=WL&ab_channel=NaturalCuriosity

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Cindy Halewood: Inspired, and an Inspiration

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The COVID-19 pandemic has brought profound changes to all of our lives. We have endured so many kinds of loss. We must be patient and wait for countless things to transpire, even when having to wait causes yet more suffering. One of the most difficult things that the Dr. Eric Jackman Institute of Child Study Lab School has had to postpone is our memorial celebration of our esteemed former colleague, the late Cindy Halewood.

Cindy began her career at Jackman ICS in 1995 as an Early Childhood Assistant (ECE) in the school's Kindergarten and Daycare. Daycare Supervisor Anne Marie Bartoli remembers her first meeting with Cindy. "She was wearing khaki pants with a t-shirt that promoted a camp. She had her resume in one hand and a thermos of coffee in the other.... She spoke about her goals, her dreams, and her experiences. We spoke about her love for her [family] farm. She delightedly mentioned her travels, and that one day she planned to see more of the world. At his point, we knew that we had a match. Our children at [JICS] would truly share the same dreams."

"She instantly won our hearts with her kindness, humour, knowledge and caring," former principal Elizabeth Morley remembers. Cindy then decided to return to school in 1999 to obtain her B.Ed. at the University of Toronto. Afterward, Morley was glad to have Cindy back. "She graduated carrying an award as a top student of education with job possibilities everywhere. But for a second time, she chose us."

Cindy began as a classroom teacher in the Nursery in 2000, and immediately made an impression with her students and their families. Jim, one of the class parents that first year, recounts this story. "Two dozen 3-year-olds piled into that big classroom at the south end of the building and were immediately caught up in the Cindy aura and the Cindy era, where learning happened communally, in big circles and with great joy. As a parent, it was incredibly hard to leave after drop-off when it would have been so much more thrilling to stick around and see what Cindy had in store that day. Halloween was unforgettable: Cindy in the centre dressed as a farmer, surrounded by witches, robots, one baboon, and a not-very-sinister Darth Vader. Cindy persuaded each child that they were so convincing in the part as to be unrecognizable. Each one felt one inch – or 10% – taller." (Aftercare Cremation and Burial Service. https://www.aftercare.org/obituaries/Cindy-Halewood/)

Even as an early career teacher, Cindy was a generous and dedicated mentor to teacher-candidates from the school's MA program in Child Studies and Education, and regularly presented in the program's academic classes. Cindy began documenting her work with very young children as an early collaborator with Dr. Marlene Scardamalia and Dr. Carl Bereiter's research in Knowledge Forum and knowledge building at OISE, University of Toronto.

Cindy moved to Junior Kindergarten, and during her time in this grade she accepted a one-year secondment to Mills College Children's School in Oakland, California, for the 2007-2008 school year. Preschool Head Teacher Nanu Clark worked closely with Cindy that year. "It was an honor to have the experience of working alongside Cindy for a year. I was so impressed with Cindy's ability to step into a strange role in a strange school with a bunch of colleagues whom she didn't really know very well. She stepped into that role as if she had always been there, and she folded into our group of close-knit colleagues seamlessly. When Cindy was here, she was the head teacher of a classroom of two- and three-year-olds, while I was the teacher of the four- and five-year-olds. Cindy had a lot of experience with children in my age group and I always appreciated her insight and ideas about what was different and what was the same in her experiences teaching in Toronto. We used to talk about having a reverse exchange—having me come to University of Toronto to teach for a year. Although it never happened, it was a lovely fantasy, and I would have enjoyed the experience of teaching alongside Cindy and *her* colleagues."

Cindy eventually moved to Grade 2 in September 2008, where, according to Morley, "she famously advanced the school's reputation for nurturing children's lifelong curiosity and passionate commitment to learning." She was a fearless innovator, always willing to take the first steps in bringing about evolving curriculum and pedagogy.

It was Cindy's infectious enthusiasm as a person and educator that made her the exemplary teacher she was. Inspired by colleague Richard Messina's work bringing Shakespeare to junior grades, Cindy jumped in with both feet and began producing Shakespeare comedies in Grade 2. After discovering the heartwarming story of Caine Monroy, a boy who made arcade games from cardboard and found objects and inspired his community, she challenged her students to make

and build their own original arcade game designs and then to invite the rest of the school to play them. (Caine's Arcade. https://www.youtube.com/watch?v=faIFNkdq96U)

Her ardent commitment to environmentalism and conservation defined the core of her classroom work, which involved extensive inquiries into observing the lives of trees, managing an in-class salmon nursery, and conducting year-long studies into all aspects of the lives of local birds. Both avid birders, Cindy and her wife prioritized bird watching in their extensive travels. She translated this lifelong passion to her students.

Current principal Richard Messina shares this memory. "When I first became Principal, I foolishly suggested to Cindy that she explore curriculum choices beyond birds and salmon. Cindy 'helped me to understand' what I deeply know now, that passionate teachers breed innovative learning. In The Passionate Teacher: A Practical Guide, Robert Fried explains that, 'to be a passionate teacher is to be someone in love with a field of knowledge, deeply stirred by issues and ideas that challenge our world, drawn to the dilemmas and potentials of the young people who come into class each day — or captivated by all of these.' Cindy knew what the research shows: teachers—not books, not technology, not buildings, and not even class size—are the most powerful drivers of student performance." (Fried, R. (2001). *The Passionate Teacher: A Practical Guide*. Beacon Press.)

Cindy also advocated for the need for extended classroom inquiries in the second edition of the Lab School's book, Natural Curiosity. "This kind of learning cannot be rushed; a full year of study on one subject both expands students' understandings and demands a more rigorous examination of how they build knowledge." (Anderson, D., Comay, J., & Chiarotto, L. (2017). *Natural Curiosity 2nd Edition: A resource for Educators*. The Laboratory School at the Dr. Eric Jackman Institute of Child Study.)

In further elaborating on her philosophy behind these inquiries, Cindy stated, "My goal is to help the students to see themselves as co-inhabitants of the Earth and to discover their duty to take care of it.... I don't shy away from discussing real issues that concern the environment with the children.... My role is to help them develop some perspectives about the realities we all face and to support them in learning about possibilities for affecting positive change in the natural world." (Anderson, D., Comay, J., & Chiarotto, L. (2017). *Natural Curiosity 2nd Edition: A resource for Educators*. The Laboratory School at the Dr. Eric Jackman Institute of Child Study.)

Cindy was also the first teacher from the school to begin a reciprocal educational relationship with Johnny Therriault School in Aroland First Nation. She travelled to Aroland with Natural Curiosity Program Director Andrea Russell, and again the following year with Program Director Haley Higdon. "[Cindy] was an integral part of developing the relationship with this community," Higdon recalls.

Marlo Beaucage of Aroland First Nation remembers Cindy well. "Cindy was instrumental in forming a lasting bond between Johnny Therriault School and the Dr. Eric Jackman school. She walked with a gentle approach to the relationship that was formed with the students and staff here in Aroland First Nation. As the relationship grew, Cindy shared her wonderful teachings and inquiry approaches with [me and] other staff members through connections such as Skype and professional development. Cindy demonstrated a true aspect of respect, relevance, relationship, and of course reciprocity. For that, we are forever grateful."

Cindy was also a proud member of the LGBTQIA+ community. She and her wife Lisa were devoted to one another and were among the first couples to marry when gay marriage was legalized in Canada in 2003. She advocated for LGBTQIA+ visibility in the school's curriculum and was a beacon and a mentor to younger staff members who also identified within the LGBTQIA+ community.

Cindy was a beloved member of the staff. "I feel her legacy is how she shared her love and passion for birds; it was so contagious. Because of Cindy, I will never look at birds in the same way again," longtime colleague Christel Durand says. "When Cindy got sick, I admired her and Lisa's support for one another and the path they took to make the most of their time together. Bravery, courage and love are the words that come to mind when I think of them."

Cindy's impact on the school community can be best illustrated in the words of families and students. Aviva, a former parent at the school, described her children's experience with Cindy. "Having had the pleasure of having Cindy be our classroom teacher 5 times we all have so many memories of bird stories, salmon hatchings, cardboard arcades, and of course Shakespeare's plays! Cindy loved to teach and had insight into each of our kids that helped us become better parents to them. One of my strongest memories was [of] one of the kids (at age 7) spending hours of time, and all his allowance, to make a gift for Cindy to thank her for working so hard with them on the play, all on his own volition." (Aftercare Cremation and Burial Service. https://www.aftercare.org/obituaries/Cindy-Halewood/)

Former student Justine included this story in her class valedictory address. "JICS has taught me to just 'go for it,' even when I'm nervous. And it was Cindy Halewood, our Grade Two teacher, who taught me this. You see, she is the reason I'm speaking in front of you all right now. When I was in Grade Two, seven-year-old me was a big talker, just not in front of big crowds of people I didn't know.... I took a two-week

trip to Japan during the school year, and Cindy encouraged me to do a presentation about it. At first, I was hesitant but after deep thinking I said yes. I took and gathered photos in Japan and put in lots of effort to create a presentation. But when the day [came] to present I was freaking out like crazy. When I got to the smartboard in front of my whole class my knees started shaking and I felt like I was going to pass out, but with just one look of encouragement from Cindy I knew I was going to be fine. And boy was she right! Cindy was many things: funny, nice, kind, creative, a bird lover, a good story teller, but she was also a real inspiration to every single one of us. Cindy taught me to be confident, even when I'm unsure."

Former student Isaac took the time to write this tribute for Cindy's memorial. "The event that changed my life was having Cindy Halewood as my Grade Two teacher. I'd always been interested in the natural world and animals but Cindy introduced me to the idea that someone could engage so deeply with birds.

"Cindy recommended books to me that would take me deeper and deeper into this brand new world of birds. She gave me [the] book "Kingbird Highway" by Ken Kaufman, a memoir about a year in which the author tried to see as many birds as possible. This was the first time I saw how all-encompassing birding could be. It showed me that a hobby could turn into something you spent your life on.

"Cindy took us out on field trips and we saw many birds that marked the beginning of my birding life list, such as the Eastern Kingbird and the Blackburnian Warbler. This hobby has defined much of my life since Grade Two. I'm now extremely aware of the natural world. I now go birding during migration seasons, read birding books religiously, and may study birds in my later years of schooling. My life list is now at 280 different species.

"... From [Cindy], I learned to be aware of all [the] joyful experiences the natural world can show us. I think about her every day. I remember those days after school when she and I would trade fragments of bird trivia and the terrible despair in my heart when I learned she wasn't coming back for my Grade Three year. Cindy may be gone, but now I know how deeply one can love nature and understand birds. Thank you so much for giving me an amazing year and a lifetime perspective on the world, Cindy." (Aftercare Cremation and Burial Service. https://www.aftercare.org/obituaries/Cindy-Halewood/)

Cindy left us on November 8th, 2018. Her passing was a profound loss for the Jackman ICS staff, students, alumni, and wider community. In our school's north courtyard, we have constructed a state-of-the-art sensory outdoor space (designed and developed by restorative landscape artist Ben Porchuk) employing top ecological methods, elements of forest therapy design, native plants, and structural features to attract wildlife, such as birds and toads. It will allow teachers to bring groups of children outside to notice with all of their senses, and enjoy deep outdoor learning experiences, in a nod to what Cindy coined the "20-Minute Field Trips." We have added an entrance threshold from the school to the courtyard, featuring a red and white cedar memorial arbour in memory of Cindy. In forest therapy terms, this entrance represents the 'threshold of connection,' offering visitors a place to 'step forward' into a deeper relationship in nature. Staff and students have come together to sculpt clay birds, which will be placed throughout the space in Cindy's honour. We are looking forward to the time when we can safely gather here to finally have our memorial celebration for this remarkable educator.

INFORMATION FOR CONTRIBUTORS

Call for Papers—IALS Journal 2022

Information for Contributors

The *IALS Journal*, a refereed journal, publishes articles that contribute to the knowledge and understanding of laboratory and university affiliated schools and other significant educational issues. Most articles focus on research, innovation, or opinion. The subjects most often addressed are teaching techniques; administrative concerns; functions, history, and the future of laboratory schools; innovations in curriculum and program; teacher education; student growth and development; and philosophical topics. Rebuttals, responses, and book reviews are also considered for publication. We also welcome articles outlining innovative teaching practices in laboratory schools and columns celebrating exceptional laboratory schools or laboratory school educators. Unsolicited manuscripts are additionally encouraged for consideration, though preference is given to articles that link explicitly to laboratory schools. The Journal is published once a year.

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Length

The maximum acceptance length is twenty-five pages, including all references and supplemental material.

Format

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Submission

Send your submission electronically to the editor of the journal at tesmithmoore@ship.edu. Please submit your manuscript as an editable Google doc link. Submissions should **also include author's titles and affiliations, mailing addresses, and a 2-5 sentence author biography**. For consideration in the Spring 2022 volume of the journal, please submit by **Oct. 31, 2021.**

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The *IALS Journal* reserves the right to make editorial changes in all manuscripts to improve clarity, to conform to style, to correct grammar, and to meet space requirements. All submitted articles are reviewed by the Editors to determine acceptability for publication in the *IALS Journal*. During the revision phase, authors should include information concerning their title, position, laboratory school, university name, location, etc. A brief author biography and school overview will be included at the conclusion of each article.

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