A Cognitive Work Analysis of a Pedagogical Documentation Technology in Ontario’s Kindergarten Program

by

Mary Elizabeth Picher

A thesis submitted in conformity with the requirements
For the degree of Doctor of Philosophy
Applied Psychology and Human Development
Ontario Institute for Studies in Education
University of Toronto

© Copyright by Mary Elizabeth Picher 2019
A Cognitive Work Analysis of a Pedagogical Documentation Technology in Ontario’s Kindergarten Program

Mary Elizabeth Picher

Doctor of Philosophy

Ontario Institute for Studies in Education

University of Toronto

2019

Abstract

Research has shown that factors related to the home learning environment are roughly twice as significant in influencing the social and cognitive development of young children as any factors related to preschool (Siraj-Blatchford, Taggart, Sylva, Sammons, & Melhuish, 2008). Therefore, maintaining a reciprocal connection between the home learning environment and school has become a critical component of early childhood educational programs in Canada. Recently, early childhood practitioners have been turning to pedagogical documentation technology (PDT) to forge this connection. This study examined the impact of a PDT, called Storypark, on the home-school connection in 11 kindergarten classrooms at four schools in a large, urban school district in Ontario.

By applying Vicente's (2003) Human-tech framework to cognitive work analysis (CWA), this study followed a design research methodology to examine the impact of and promising practices for PDT use in Ontario’s Kindergarten Program. Eight lessons pertaining to PDT and two lessons pertaining to CWA resulted from these analyses.

PDT lessons showed that PDT supported: 1) Parent-educator communication, 2) The parent-educator relationship, 3) Parents’ understanding of their children’s classroom
learning, 4) Educators’ and parents’ understanding of *The Kindergarten Program* curriculum, 5) Conversations between parents and their children, 6) Student learning and 7) Parents’ involvement in their children’s learning. However, while PDT supported these areas of the home-school connection, the eighth PDT lesson showed that the Human-tech relationship could be improved to support a stronger home-school connection.

CWA lessons showed that CWA: 1) Predicted the extent to which a PDT was successfully adopted and 2) Provided useful information about which Human-tech factors need to be modified in order to support a more effective adoption of PDT. More specifically, factors pertaining to the political and organizational levels of the work environment were identified.

This thesis makes important contributions to a growing evidence base, which demonstrates the positive impact that PDT can have in promoting educator-parent communication and partnerships, parent-child conversations and student learning in early childhood educational settings. Furthermore, it is the first study of its kind to identify promising practices for PDT use in the context of an early learning program in Canada.
Acknowledgments

This thesis would not have been possible without the wisdom, guidance and support of my supervisor, Dr. Earl Woodruff. Thank you, Professor Woodruff for your vital contributions to this work. Through you, I was introduced to the methodology of my thesis, namely cognitive work analysis and Vicente’s (2003) Human-tech framework. You were accessible, open-minded and unwavering in your belief in me from the very beginning of my thesis journey to the end.

I would also like to thank Dr. Charles Pascal for his contributions to my thesis. As a committee member, you helped me stay focused on the most important part of my story, which was the relationship between the home environment and school setting. Thank you for your laser-like vision, unparalleled leadership and ability to cut through it all. You have been an incredibly generous teacher and mentor.

I would also like to thank Dr. Janette Pelletier who agreed to be a part of my thesis committee even as she was getting ready to retire. I feel so incredibly fortunate that I was able to work with you, one of the greatest kindergarten researchers of all time. Your suggestion to interview the kids was critical to the importance of this work.

I am extremely grateful to the Toronto District School Board for allowing me to conduct my research study in 11 kindergarten classrooms at four schools within the board. More specifically, I would like to thank the principals, educators, parents and students who agreed to participate in my thesis project. You opened up your schools and classrooms and took time out of your busy schedules to answer interview questions, fill out surveys and implement a new technology into your lives. I cannot thank you enough for your participation.
Finally, I would like to thank my family. From my mother-in-law, who waited in the hall with my newborn so that I could attend class, to my parents who afforded me the time to focus on my thesis, to my husband who made countless sacrifices so that I could study, to my young children who waited patiently while I took time away from them to learn about other young children their age. Thank you. I truly could not have done it without your support and love. This thesis is dedicated to you.
Table of Contents

ABSTRACT .......................................................................................................................... ii

ACKNOWLEDGEMENTS ................................................................................................... iv

LIST OF TABLES .............................................................................................................. vii

LIST OF FIGURES .......................................................................................................... viii

LIST OF APPENDICES .................................................................................................... viii

PROLOGUE ....................................................................................................................... 1

CHAPTER ONE: INTRODUCTION .................................................................................. 3
  The Research Context ...................................................................................................... 4
  Theoretical Frameworks ................................................................................................. 5
  Methodology of the Study .............................................................................................. 7
  Purpose of the Study ...................................................................................................... 8
  Overview of the Study ................................................................................................... 6
  Definitions ...................................................................................................................... 11
  Organization of the Study .............................................................................................. 14
  Chapter Summary ........................................................................................................ 15

CHAPTER TWO: LITERATURE REVIEW ..................................................................... 17
  Chapter Overview ........................................................................................................ 17
  Theories ......................................................................................................................... 17
  Summary (Theories) ..................................................................................................... 29
  Context ......................................................................................................................... 30
  Summary (Context) ...................................................................................................... 42
  Research ....................................................................................................................... 43
  Summary (Research) .................................................................................................... 55
  Chapter Summary ........................................................................................................ 57

CHAPTER THREE: METHODOLOGY .......................................................................... 59
  Chapter Overview ........................................................................................................ 59
  Methodological Components ....................................................................................... 59
  The Rational for the Research Design ......................................................................... 64
  The Research Context ................................................................................................ 65
  Research Procedure and Timeline ............................................................................. 69
  Procedures for Implementation .................................................................................. 73
  Data Sources ................................................................................................................ 74
  Ethical Considerations ................................................................................................. 80
  Chapter Summary ........................................................................................................ 81
CHAPTER FOUR: RESULTS ............................................................................. 82
Chapter Overview .................................................................................... 82
Learning Stories ..................................................................................... 82
Summary (Learning Stories Qualitative) .................................................. 102
Summary (Learning Stories Quantitative) ................................................ 111
Surveys .................................................................................................... 112
Summary (Educator Survey) ................................................................... 119
Summary (Parent Survey) ....................................................................... 129
Post-Interviews ....................................................................................... 132
Summary (Post-Interviews) ..................................................................... 147
CWA Interviews ...................................................................................... 151
Summary (CWA Qualitative) .................................................................. 166
Summary (CWA Quantitative) ................................................................. 173
Chapter Summary .................................................................................. 174

CHAPTER FIVE: DISCUSSION ..................................................................... 175
Chapter Overview ................................................................................... 175
PDT-related Lessons ............................................................................... 175
CWA-related Lessons ............................................................................ 194
Chapter Summary .................................................................................. 198

CHAPTER SIX: CONCLUSION ................................................................... 200
Chapter Overview ................................................................................... 200
Summary of Findings ............................................................................. 200
Implications ........................................................................................... 202
Limitations ............................................................................................. 204
Areas for Future Research ..................................................................... 206
Significance ............................................................................................ 207

REFERENCES ............................................................................................ 209

LIST OF TABLES
Table 1 Summary of Research Participants ........................................... 66
Table 2 Summary of the Procedures and Timeline of the Research Study ....... 71
Table 3 Summary of Educator Learning Stories ....................................... 87
Table 4 Summary of Parent Comments .................................................. 90
Table 5 Summary of Parent Learning Stories ......................................... 93
Table 6 Summary of Educator Comments .............................................. 95
Table 7 Summary of Educator Learning Stories at all Four Sites ............... 99
Table 8 Summary of Parent Comment Categories at all Four Sites .......... 102
Table 9 Summary of Educators’ Use of Storypark (Overall) ..................... 106
Table 10 Summary of Educator-Parent Communication Overall (Totals) ..... 107
Table 11 Summary of Educator-Parent Communication Overall (Averages) ... 107
Table 12 Summary of Educator’s Use of Storypark by Site ....................... 108
Table 13 Summary of Educator-Parent Communication by Site (Totals) ..... 110
Table 14 Summary of Educator-Parent Communication by Site (Averages) ... 110
Table 15 Quantitative Results of Educator Survey……………………………………..118
Table 16 Summary of Impact of Storypark on Parents……………………………………..127
Table 17 Summary of Parents’ Level of Satisfaction……………………………………..129
Table 18 Summary of Students’ Awareness of Storypark…………………………………..145
Table 19 Summary of Human-tech Constraints and Affordances at Site A……………152
Table 20 Summary of Human-tech Constraints and Affordances at Site B……………155
Table 21 Summary of Human-tech Constraints and Affordances at Site C……………159
Table 22 Summary of Human-tech Constraints and Affordances at Site D……………162
Table 23 Summary of Constraints vs. Affordances at Site A…………………………..171
Table 24 Summary of Constraints vs. Affordances at Site B…………………………..171
Table 25 Summary of Constraints vs. Affordances at Site C…………………………..172
Table 26 Summary of Constraints vs. Affordances at Site D…………………………..172
Table 27 Summary of Constraints vs. Affordances at all Sites…………………………..174

LIST OF FIGURES
Figure 1. Nested model of ecological systems originally proposed by Bronfenbrenner.19
Figure 2. Vicente’s (2003) Human-tech ladder…………………………………………23
Figure 3. Comparison of the ecological systems model to the Human-tech ladder……..25
Figure 4. Breakdown of Learning Story Categories (Educator)…………………………..88
Figure 5. Breakdown of Parent Comment Categories……………………………………..91
Figure 6. Breakdown of Learning Story Categories (Parent)……………………………..93
Figure 7. Breakdown of Educator Comment Categories…………………………………96
Figure 8. Breakdown of Educator Learning Stories at Site A…………………………..97
Figure 9. Breakdown of Educator Learning Story Categories at Site B…………………97
Figure 10. Breakdown of Educator Learning Stories at Site C…………………………..98
Figure 11. Breakdown of Educator Learning Stories at Site D………………………….99
Figure 12. Breakdown of Parent Comments at Site A……………………………………100
Figure 13. Breakdown of Parent Comments at Site B……………………………………100
Figure 14. Breakdown of Parent Comments at Site C……………………………………101
Figure 15. Breakdown of Parent Comments at Site D…………………………………..102

LIST OF APPENDICES
Appendix A. CWA Interviews Questions for Principal………………………………….215
Appendix B. Coding Key……………………………………………………………………..217
Appendix C. Instructions for Coding…………………………………………………………218
Appendix D. Educator Survey…………………………………………………………………220
Appendix E. Parent Survey……………………………………………………………………223
Appendix F. Interview Questions for Post-Interview with Educators…………………..229
Appendix G. Interview Questions for Post-Interview with Point Parents………………230
Appendix H. Interview Questions for Post-Interview with Students…………………..231
Appendix I. CWA Interview Questions for Kindergarten Educators…………………..232
Appendix J. CWA Interview Questions for Kindergarten Parents…………………..234
Appendix K. Site A: Complete Human-tech Ladder……………………………………..236
Appendix L. Site B: Complete Human-tech Ladder…………………………………….247
Appendix M. Site C: Complete Human-tech Ladder…………………………………….256
Appendix N. Site D: Complete Human-tech Ladder…………………………………….262
Prologue

It is not unusual for the choice of an area of research to be informed by one’s unique narrative. That is true in this case. The topic for this thesis project came out of personal, professional and, of course, academic interest. I am a mother of two children, ages five and seven-years-old. When I began this research project (2016), my son was a kindergarten student. Naturally, as a parent, I was interested in how best to communicate with his early years educators.

It is also true that my son’s kindergarten program was located at one of the sites that participated in this study. At the time, I felt that there was a lack of communication from my son’s school about the learning activities that he participated in and about his day in general. While my son’s educators declined to participate in the study because they had already committed to using another technology, colleagues of theirs did agree to participate. Naturally, the data that were generated from those educators as well as the parents at this site might have been analyzed through a more personal lens than the data that were generated at the other three sites.

Professionally, the subject matter for this thesis appealed to me because of the work I was doing as a founder and educational director of an early childhood development company that offers classes and services to parents with young children. Arising from this work, I did some consulting for Storypark in 2015, the PDT evaluated in my thesis. Thus, as a parent seeking effective two-way communication with my children’s educators and as an entrepreneur working in the early childhood education sector, my interest was peaked in bringing the Storypark technology to Ontario’s Kindergarten Program.
Importantly, in February of 2016, I terminated my contractual relationship with Storypark so that I could pursue this research topic for my dissertation study without a conflict of interest. Since that point, Storypark has not provided me with payment of any kind for the research conducted for this thesis project nor for any other work that I have performed outside of the scope of this research project.
Chapter One: Introduction

Over the past several decades, the science of early childhood development has made clear that healthy human development occurs within the context of responsive relationships (National Scientific Council on the Developing Child, 2004). Research has shown that the relationships young children have to their primary caregivers are particularly influential in determining developmental trajectories, such that factors pertaining to the home learning environment are roughly twice as significant in influencing cognitive and social development as any factors related to preschool (Siraj-Blatchford, Taggart, Sylva, Sammons, & Melhuish, 2008). Moreover, research has demonstrated that young children learn even in suboptimal preschool settings when there is a “special relationship” between their parents and their educators in terms of shared educational goals (Siraj-Blatchford, Sylva, Muttock, Gilden, & Bell, 2002, p.11). As such, developing a reciprocal connection between the early childhood educational setting (ECE) and the home learning environment is critical to supporting young children’s learning and development.

More recently, governments around the world have recognized the crucial role that parents play in influencing their children’s developmental outcomes and have made family involvement a central aspect of their early childhood policies and programs. Out of this context, a proliferation of pedagogical documentation technology (PDT) or online platforms, which allow early childhood educators and parents to share stories, pictures and/or videos of their young children’s learning, has emerged. Despite the widespread use of such technologies in ECE settings, very little is known about the impact that PDT has on educators, parents and/or young children themselves. Perhaps more importantly,
virtually nothing is known about how educators and parents can most effectively utilize PDT to strengthen the connection between the home learning environment and the ECE setting. As such, this research study sought to understand the impact of a specific PDT (i.e., Storypark) on the home-school connection in the early learning context of Ontario’s Kindergarten Program as well as uncover promising practices for using PDT within this context.

The Research Context

New Zealand’s Ministry of Education is an example of a government that made family involvement a cornerstone of its internationally recognized early learning curriculum, *Te Whāriki*. Therefore, it is not surprising that Storypark, the PDT that is the focus of this research study, was developed there. Moreover, nearly all the research that has been conducted on the use of PDT (otherwise called “electronic portfolios”) has taken place in ECE settings in New Zealand.

Although there is still a relatively small evidence base on the use of PDT within the specific context of ECE, studies to date have indicated that “the increasingly interactive online environment offered by [PDT] has overall tended to be conducive to building relationships between teachers and the child’s wider family unit” (Gallagher, 2018, p.25). Moreover, research on the impact of e-portfolios on young children’s engagement has shown PDT to be supportive of children’s ownership of their learning and development (Goodman, 2015).

Despite this emerging evidence base, no known systematic studies have been done on the use of PDT in ECE settings in Canada, even as the use of PDT in such settings has become increasingly more common. Therefore, this research study sought to
examine how a technology, which was originally developed to connect parents to their young children’s learning in childcare centres in New Zealand, might impact the home-school connection within an ECE context in Canada.

I chose to examine the use of a PDT in 11 kindergarten classrooms at four schools in a large, urban school district in Ontario for three primary reasons: First, Ontario is one of the more progressive provinces in Canada with respect to ECE as it has developed a comprehensive early learning framework, which understands “partnerships with families” as foundational to “the ability of early childhood settings to meet the needs of young children” (Early Learning for Every Child Today, 2008, p.6). Second, Ontario’s kindergarten curriculum, The Kindergarten Program, is closely aligned with the pedagogical principles and objectives of Te Whāriki. Therefore, Storypark, a technology that was originally developed for early childhood practitioners in New Zealand, is uniquely well suited to support the teaching goals and practices of kindergarten educators in Ontario. Finally, Ontario was transitioning to an updated version of the kindergarten curriculum at the same time I began this study. Therefore, Storypark was introduced into Ontario’s Kindergarten Program as a means of supporting this transition.

**Theoretical Frameworks**

Urie Bronfenbrenner’s ecological systems theory and bioecological theory underpin this research study. First, ecological systems theory was used to elucidate the analytical tool I used to study PDT in Ontario’s Kindergarten Program. More specifically, an adaptation of cognitive work analysis (CWA), called the Human-tech framework, (Vicente, 2003) was compared to Bronfenbrenner’s (1979) multi-systemic model, which understands a child’s development to occur within the context of nested,
interdependent subsystems. These subsystems include: the microsystem or the developing child’s most immediate system(s) in which the child actively participates; the mesosystem or the interrelations between one or more microsystem(s); the exosystem or the system in which the developing child does not actively participate, but in which his/her development is still affected; and, finally, the macrosystem or the broader social, legal and/or political culture in which the developing child is situated (Bronfenbrenner, 1979).

Second, ecological systems theory was used in this research study to describe the function of PDT within the context of ECE. More specifically, PDT was conceptualized as an online mesosystem, which brings together the developing child’s previously separate microsystems of the home learning environment and the preschool or kindergarten context. Bronfenbrenner’s (1994) bioecological theory was also used to further elucidate the function of PDT in ECE settings. More specifically, the concept of proximal processes, or the meaningful interactions a developing child has with the persons, objects, and symbols in the child’s immediate environment, was described as the content that early childhood educators document and share with their students’ parents (via PDT) as a means of both assessing and supporting young children’s learning and development.

Finally, ecological systems theory and bioecological theory were employed in this study to describe the context in which PDT was developed and is currently used. More specifically, Bronfenbrenner’s multi-systemic model and the concept of proximal processes were used to elucidate the pedagogical principles and practices outlined in Ontario’s Kindergarten Program as well as a model for this curriculum (i.e., Te Whāriki).
Methodology of the Study

An adaption of cognitive work analysis (CWA) called the Human-tech framework (Vicente, 2003) was applied to a design research protocol in order to carry out this research study. This methodological approach was selected for three primary reasons. First, CWA, an analytical tool that was originally developed by cognitive engineers to better understand and, in turn, design for complex, sociotechnical work environments, provided me with a means to capture the complexities involved in introducing a new technology into a multifaceted context (i.e., Ontario’s Kindergarten Program).

Second, Vicente’s (2003) adaptation of CWA (i.e., the Human-tech framework) allowed me to apply an analytical tool, which is typically used in more technical settings, to the educational context of Ontario’s Kindergarten Program. As such, the Human-tech framework provided me with a means to examine the “Human-tech relationship” between the users of the technology (i.e., kindergarten educators, parents and students) and the technology itself (Vicente, 2003, p.33).

Finally, I used a design research protocol because the study was interventionist in nature. Therefore, I was not only focused on understanding the impact of a PDT on the home-school connection in Ontario’s Kindergarten Program but also interested in implementing, analyzing and modifying the use of the PDT in order to best support this connection.

Purpose of the Study

The purposes of this research study were three-fold: 1) To understand the impact of a specific PDT (i.e., Storypark) on the home-school connection within the early learning context of Ontario’s Kindergarten Program, 2) To uncover promising practices
for PDT use within this context and 3) To identify lessons learned from using cognitive work analysis to implement and evaluate the use of a pedagogical documentation technology in Ontario’s Kindergarten Program. To accomplish this end, I applied an adaption of cognitive work analysis (i.e., the Human-tech framework) to a design research protocol to investigate one central research question: *What are the lessons learned from using cognitive work analysis to implement and evaluate the use of a pedagogical documentation technology in Ontario’s Kindergarten Program?*

**Overview of the Study**

In investigating the aforementioned research question, I introduced Storypark into 11 kindergarten classrooms at four schools in a large, urban school district in Ontario. Nineteen kindergarten educators (11 kindergarten teachers and 8 early childhood educators), 16 parents, 3 principals and 33 students were interviewed for this study. In addition, 220 parents participated in the study by using Storypark and/or allowing their children’s educators to use Storypark.

Kindergarten educators participated in the study in several ways. First, educators took part in an in-person, introductory training on how to use the basic functions of Storypark. This training showed educators how to: create “learning stories” or vignettes about their students’ learning using text, pictures and/or audio and video recordings; share these stories with their students’ parents; and tag these stories with learning tags (i.e., brief descriptions of *The Kindergarten Program*’s learning expectations). Second, educators allowed me to conduct an hour-long classroom observation of their teaching practices. Third, educators took part in a cognitive work analysis (CWA) interview.
Fourth, educators filled out two different online surveys at different points throughout the school year. Finally, educators completed a post-interview at the end of the school year.

Parents participated in the study by consenting to allow their children’s educators to document and share learning stories about their children’s classroom learning with them via Storypark. Parents were also invited to comment on these stories as well as to post learning stories about their children’s learning at home. Of the 220 parents that participated in the study, 16 volunteered to become point parents in their children’s classrooms. Point parents took part in a CWA interview, filled out an online survey midway through the school year and participated in a post-interview at the end of the school year.

Principals participated in the study by supporting their kindergarten educators’ involvement in the study. They also took part in a CWA interview and were invited to view learning stories posted by educators and parents via Storypark.

Finally, kindergarten students participated in the study by allowing their educators and, in some cases, their parents to document and share stories about their learning via Storypark. Some kindergarten students also viewed learning stories with their educators and/or parents. Finally, 33 kindergarten students took part in a post-implementation, debriefing post-interview (with the consent of their parents) at the end of the school year.

Six sources of data were collected throughout the course of the research study including a document analysis, classroom observations, CWA interviews, online surveys, learning stories (via Storypark) and post-interviews. Data were analyzed both qualitatively and quantitatively.
Qualitative and quantitative results from learning stories, surveys and post-interviews revealed that two types of lessons were learned from using CWA to implement and evaluate the use of a PDT in Ontario’s Kindergarten Program. These included lessons pertaining to pedagogical documentation technology or “PDT-related lessons” as well as lessons pertaining to cognitive work analysis or “CWA-related lessons.” Eight PDT-related lessons were learned, while two CWA-related lessons were learned.

PDT-related lessons showed that PDT supported: 1) Parent-educator communication, 2) The parent-educator relationship, 3) Parents’ understanding of their children’s classroom learning, 4) Educators’ and parents’ understanding of The Kindergarten Program curriculum and/or play-based learning, 5) Conversations between parents and their children about their children’s learning, 6) Student learning and 7) Parents’ involvement in their children’s learning. These findings were consistent with those found in previous studies done on the use of e-portfolios in ECE settings in New Zealand. However, while findings demonstrated that PDT supported seven key aspects of the home-school connection, the eighth lesson pertaining to PDT showed that the Human-tech relationship between PDT and the “workers” (i.e., kindergarten educators, parents and students) could be improved to support a stronger home-school connection.

CWA-related lessons showed that CWA: 1) Predicted the extent to which a given technology (i.e., Storypark) was successfully adopted by the workers in the work environment (i.e., 11 kindergarten classrooms at four schools in a large urban school district in Ontario) and 2) Provided useful information about which Human-tech factors need to be modified in order to support a more effective adoption of PDT by the workers.
More specifically, factors pertaining to the political and organizational levels of the work environment were identified as requiring modification (Vicente, 2003).

**Definitions**

The following section is provided to clarify the meaning of the particular terms used in this thesis as well as to make the terminology more accessible to the reader:

*Affordances* – factors in the work domain that facilitate the workers’ abilities to do their work. In this study, affordances are factors that facilitate kindergarten educators’ and parents’ abilities to support their students’/children’s learning and development, particularly with respect to the use of PDT.

*Cognitive Work Analysis (CWA)* – was first developed by Rasmussen, Pejtersen & Goodstein as a technological design tool to better understand (and design for) complex, sociotechnical work environments such as aviation, medicine and ergonomics among others (Vicente, 1999).

*Constraints* – factors in the work domain that limit the workers’ abilities to do their work. In this study, constraints are factors that limit kindergarten educators’ and parents’ abilities to support their students’/children’s learning and development, particularly with respect to the use of PDT.
Early childhood educational settings (ECE) – includes any centre that caters to the learning of young children. These locations may include childcare, preschool, nursery school and/or kindergarten.

Learning Stories – a narrative form of pedagogical documentation based on the “learning story framework,” which was originally developed by Carr, May and Podmore (2002). This framework involves describing the child’s learning experience, documenting the child’s learning experience, discussing the child’s learning experience with the child, another practitioner and/or the child’s family and deciding what to do about the child’s learning experience in terms of planning subsequent learning experiences.

Pedagogical – refers to the act of teaching.

Pedagogical Documentation – the primary method early childhood educators use to assess, reflect upon and support their students’ learning. This documentation involves collecting student work, taking pictures of student learning and writing stories about student learning among other methods. Students and their families are both the recipients of and contributors to pedagogical documentation.

Pedagogical Documentation Technology (PDT) – online platforms, which allow early childhood educators to create and share vignettes or learning stories about their students’ learning via text, pictures and/or audio and video recordings. These stories are typically
shared with students and their families. Another term for this technology is “electronic portfolios” or “e-portfolios.”

The home-school connection – describes the “special relationship,” which connects a young child’s home learning environment to that of the ECE setting (Siraj-Blatchford et al., 2002, p.11). As has been demonstrated by research in the field of early childhood development, the learning and development of young children are enhanced by parental involvement in ECE settings. As such, the home-school connection involves a reciprocal relationship between early childhood educators, parents and young children, which supports the learning and development of young children.

The Human-tech framework – an adaption of CWA devised by Kim Vicente (2003) for use in social science fields, such as education. The Human-tech framework focuses on understanding human-technical factors related to five different categories of the work domain including physical, psychological, team, organizational, and political factors.

The Human-tech ladder – the construct Vicente (2003) uses to organize the five categories of Human-tech factors.

Storypark – a type of PDT that was originally developed for early childhood practitioners following the early learning curriculum, Te Whāriki, in New Zealand.
Work Domain – a term from CWA, which describes the work environment. In this study, the work domain refers to the Kindergarten Program in 11 kindergarten classrooms at four schools in a large, urban school district in Ontario.

**Organization of the Study**

This thesis is comprised of six chapters. Chapter one provides an introduction to the research study. This includes the research context, the theoretical frameworks that underpin the study, the methodology used to conduct the study, the purpose of the study, the research question, an overview of the study, important definitions and the organization of the study.

Chapter two reviews three main areas of literature, which relate to the central research question. These areas include Bronfenbrenner’s theories of ecological systems theory and bioecological theory; the context of ECE in New Zealand and Ontario; and research, which pertains to the home learning environment, parental involvement in preschool settings and e-portfolio use within the context of ECE.

Chapter three outlines the methodology used to conduct the study. This includes descriptions of CWA, the Human-tech framework and design research; a rationale for why I chose this particular methodological approach; as well as an outline of the research design.

Chapter four reports the results of the four primary data sources. This includes qualitative and quantitative findings from learning stories; qualitative and quantitative results from surveys; qualitative findings from post-interviews; and qualitative and quantitative results from CWA interviews.
Chapter five discusses the results of chapter four as they pertain to the research question. Included in this discussion are two types of lessons learned: namely PDT-related lessons and CWA-related lessons. Eight PDT-related lessons and two CWA-related lessons are described.

Finally, chapter six presents the conclusion of the research study. This includes the implications and limitations of the study, areas for future research, as well as the significance of the study.

Chapter Summary

As research has shown that factors relating to the home learning environment are roughly twice as significant in influencing social and cognitive development as any factors relating to preschool, the critical importance of including young children’s parents and guardians in ECE settings has become widely recognized by governments around the world (Siraj-Blatchford et al., 2008). Out of this context, a proliferation of PDT, or online platforms, which allow early childhood educators and parents to share stories, pictures and/or videos of young children’s learning, has emerged. Despite the widespread use of these technologies, very little is known about the impact that PDT has upon educators, parents and/or young children themselves. Moreover, virtually nothing is known about the best practices for PDT use in ECE settings. As such, the purpose of this research study was three-fold: 1) To understand the impact of a specific PDT (i.e., Storypark) on the home-school connection in the early learning context of Ontario’s Kindergarten Program, 2) To uncover the promising practices for PDT use within this context and 3) To identify lessons learned from using cognitive work analysis to
implement and evaluate the use of a pedagogical documentation technology in Ontario’s Kindergarten Program.

An adaption of CWA (i.e., the Human-tech framework) was applied to a design research protocol to carry out this study. In doing so, I investigated one central research question: *What are the lessons learned from using cognitive work analysis to implement and evaluate the use of a pedagogical documentation technology within Ontario’s Kindergarten Program?* The remainder of this thesis focuses on reviewing literature pertaining to the research question, outlining the methodology used to answer the research question, reporting the results of the research study and discussing the research findings as they pertain to the research question. Finally, the thesis concludes with the implications of the research findings, the limitations of the study, areas for future research as well as the significance of the study.
Chapter Two: Literature Review

Chapter Overview

This chapter reviews three main areas of literature, which relate to the research question: *What are the lessons learned from using cognitive work analysis (CWA) to implement and evaluate a pedagogical documentation technology (PDT) in Ontario’s Kindergarten Program?* First, I discuss theories, which pertain to the analytical tool used to examine PDT in Ontario’s Kindergarten Program (i.e., CWA) as well as to PDT itself. These theories include Bronfenbrenner’s ecological systems theory and bioecological theory. Second, I discuss the context out of which PDT was developed: namely, early childhood educational settings (ECE). Since this research study concerns a specific PDT (i.e., Storypark), which was developed in New Zealand, I examine ECE in New Zealand and then discuss ECE in Ontario. Finally, I review research, which provides a rationale for the use of PDT in Ontario’s Kindergarten Program as well as insight into how this technology might impact kindergarten educators, students and parents in Ontario. This research includes the effects of the home learning environment on developmental outcomes, the impact of parental involvement in ECE settings and the use of e-portfolios in the ECE context.

Theories

Urie Bronfenbrenner provides two helpful theoretical frameworks for understanding the analytical tool I used to examine PDT in Ontario’s Kindergarten Program (i.e., CWA) as well as for understanding PDT itself. I first discuss ecological systems theory as it pertains to CWA and then describe ecological systems theory and bioecological theory as they relate to PDT.
Ecological systems theory.

Bronfenbrenner (1979) developed ecological systems theory in response to prevailing studies in human development, which largely ignored the impact of context on the developing individual. In contrast, Bronfenbrenner (1979) saw development as occurring via the interaction of an individual and his/her environment. Therefore, Bronfenbrenner (1979) questioned the validity of research that occurred in laboratory settings and argued that a developing person had to be studied within his/her natural environment in order for him/her to be properly understood.

Bronfenbrenner (1979) called this research the “ecology of human development,” which he said involved “the scientific study of the progressive, mutual accommodation between an active, growing being and the changing properties of the immediate settings in which the developing person lives” (p.21). Moreover, Bronfenbrenner (1979) said, the “relations between these settings [and between] the larger contexts” impacted the developing individual (p. 21). This description of an interrelated, hierarchical set of systems, or “a nested arrangement of structures, each contained within the next,” was a defining feature of ecological systems theory (Bronfenbrenner, 1979, p.22). In Bronfenbrenner’s original conception of ecological systems theory, these structures included the microsystem, mesosystem, exosystem and macrosystem (Neal & Neal, 2013). (See Figure 1).
Bronfenbrenner (1979) called the most proximal setting to the developing individual, “the microsystem.” The microsystem was defined as “a pattern of activities, roles and interpersonal relationships experienced by the developing person in a given setting with particular physical and material characteristics” (Bronfenbrenner, 1979, p.22). Therefore, the developing individual played a direct role, had direct experiences and direct social interactions with others within the microsystem. In the prototypical case of a developing child, the family is an example of a microsystem (Neal & Neal, 2013).

Bronfenbrenner (1979) called the next layer out from the developing individual, “the mesosystem.” The mesosystem was defined as the “interrelations among two or more settings in which the developing person actively participates” (Bronfenbrenner, 1979, p.25). As such, the mesosystem included the social interactions between two or more Microsystems. In the case of a developing child, a parent-teacher conference is an example of a mesosystem. In this example, the family functions as one microsystem and the school operates as another microsystem (Neal & Neal, 2013).
Bronfenbrenner (1979) termed the next layer out from the developing individual, “the exosystem.” The exosystem was defined as “one or more settings that do not involve the developing person as an active participant, but in which events occur that affect or are affected by what happens in the setting containing the developing person” (Bronfenbrenner, 1979, p.26). Therefore, the developing person did not play a direct role in the exosystem but rather was directly and/or indirectly impacted by it. In the case of a developing child, a school administration that creates policies, which impact the child both directly and indirectly, is an example of an exosystem (Neal & Neal, 2013).

Finally, Bronfenbrenner (1979) called the furthest layer out from the developing individual, “the macrosystem.” The macrosystem was defined as “consistencies in the form and content of lower-order systems that exist or could exist at the level of subculture or culture as a whole, along with any belief systems or ideology underlying such consistence” (Bronfenbrenner, 1979, p.26). As such, the macrosystem included cultural, legal and/or political ideologies that had far-flung consequences for the developing individual. In the case of a developing child, the child’s right to an education is an example of a macrosystem (Neal & Neal, 2013).

**Cognitive work analysis.**

Cognitive work analysis originated in Denmark in the field of cognitive engineering. Rasmussen, Pejtersen and Goodstein (1994) developed the tool to more effectively understand and design for complex, sociotechnical, “cognitive” work environments (i.e., power plants, hospitals and libraries) (Fidel & Pejtersen, 2005). However, researchers from a variety of different disciplines including sociology, psychology and education have since adopted the approach to study a wide-range of
phenomena, as it can be used to understand any large scale, multifaceted environment in which information processing is central to its primary function (Vicente, 1999).

One of the reasons why CWA is so versatile is because its theoretic roots extend beyond theories that are more traditionally associated with the field of engineering (Fidel & Peijtersen, 2005). More specifically, CWA draws on James J. Gibson’s ecological psychology, which posited that an individual and his/her environment could not be understood apart from one another (Tudge, Gray, & Hogan, 1996). As such, Gibson, like Bronfenbrenner, viewed an individual’s development as inseparable from his/her context.

Tudge et al., (1996) draw several parallels between Bronfenbrenner and Gibson as they say both theorists employed an “ecological” perspective and were concerned with the “mutual reciprocity” of the developing individual and his/her environment (p.96). Moreover, both theorists were dissatisfied with the dominant trend in psychology, which viewed the developing individual and his/her environment as “dichotomous entities whose influences on development could be studied separately” (Tudge et al., 1996, p.96). As such, Gibson, like Bronfenbrenner, railed against laboratory research and argued that the developing individual had to be studied within the context of his/her natural surroundings in order to be properly understood.

Despite these similarities, Tudge, et al., (1996) point out a critical difference between Gibson’s research and Bronfenbrenner’s research, which is that Gibson focused on visual perception and how the physical characteristics of the environment impacted development, while Bronfenbrenner focused on human interaction and how social and cultural phenomena influenced development. Therefore, it is not surprising that CWA, a tool that was originally developed by and for engineers, would borrow more from a
framework that focuses on the physical properties of the environment, rather than on its social characteristics. However, the Human-tech framework, an adaptation of CWA developed by Kim Vicente (2003), encompasses both the sociological aspects of a given work environment as well as its physical and technological characteristics. (See the next chapter for a further description of CWA).

**The Human-tech framework.**

Vicente (2003), a human factors engineer and self-proclaimed “technological anthropologist” developed the Human-tech framework in response to the present state of society, which he says is inundated with technology that is “spinning beyond our control” and “wreaking havoc” on our quality of life (p.29). According to Vicente (2003), this is because the complexity of technology is outpacing the “sophistication of the coalition required to control it effectively” (p.41). In other words, “technology is out-of-sync with human society” (Vicente, 2003, p.33).

The solution to this problem, Vicente argues (2003), is the adoption of a Human-tech framework, which merges knowledge from Humanistic disciplines (e.g., psychology and sociology) with information from Mechanistic fields (e.g., engineering and computer science) so as to make visible the “Human-tech relationship” between people and technology (p.33). Without this trans-disciplinary approach, Vicente says (2003), designers of technology will continue to develop technical “solutions” that create more problems for human society than they solve. Moreover, Vicente (2003) maintains, “the design of technology should begin by identifying a human or societal need – a problem worth solving – and then fulfill that need by tailoring the technology to the specific, relevant human factors” (p.45).
Vicente’s (2003) Human-tech framework considers five levels of specific, relevant human factors, starting with a consideration of pertinent physical attributes, ascending upwards towards an examination of psychological, team, organizational, and political characteristics. According to Vicente (2003), it is only through an investigation of this multilayered, systems-based “Human-tech ladder,” that technology designers grasp a comprehensive understanding of the human context for which they are designing, and thus, offer genuine technical solutions. In this way, the analytical tool Vicente employs to better understand and, in turn, design for cognitive work environments (i.e., the Human-tech ladder) resembles the multi-systemic framework Bronfenbrenner used to illustrate the complexities of human development. (See Figure 2).

<table>
<thead>
<tr>
<th>POLITICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORGANIZATIONAL</td>
</tr>
<tr>
<td>TEAM</td>
</tr>
<tr>
<td>PSYCHOLOGICAL</td>
</tr>
<tr>
<td>PHYSICAL</td>
</tr>
</tbody>
</table>

*Figure 2. Vicente’s (2003) Human-tech ladder*

**Ecological systems theory and the human-tech ladder.**

Several parallels exist between Vicente’s Human-tech ladder and Bronfenbrenner’s ecological systems model. First, both begin with an examination of the physical factors of an individual’s environment as Bronfenbrenner (1979) described the microsystem as a “setting with particular physical and material characteristics” (p.22). However, the microsystem also encompasses the psychological level of the Human-tech ladder as Bronfenbrenner (1979) included “the psychological characteristics of all the
individuals present” in his description of the microsystem (p.22). Moreover, the team level of Vicente’s Human-tech ladder, which refers to the social dynamics between individuals in a given work environment, is also incorporated within the microsystem as Bronfenbrenner (1979) described this system as “a pattern of interpersonal relations experienced face-to-face in a given environment” (p.22).

However, it is possible that the team level could also be included in the mesosystem. For example, if individuals in a given work environment interact with individuals in a separate work environment, such as another department, the team level would more closely correspond to the mesosystem as Bronfenbrenner (1979) portrayed this system as the “interrelations among two or more settings in which the developing person actively participates” (p.25).

The organizational level of the Human-tech ladder, which Vicente (2003, p.57) defines as “the larger unit” functions much like Bronfenbrenner’s (1979) description of the exosystem, which included settings that influenced the developing individual, but in which the developing individual did not directly participate.

Finally, the political level of the Human-tech ladder closely resembles Bronfenbrenner’s description of the macrosystem as Vicente (2003) portrays this level as the “topmost level in the framework,” which involves “basic considerations such as public opinion, social values and cultural norms that must be respected” (p.58).

Despite their similarities, Vicente’s framework and Bronfenbrenner’s model have several notable differences. First, Vicente employs his framework as a tool for design, while Bronfenbrenner used his model as an instrument for understanding. Therefore, the Human-tech framework and ecological systems theory have different end goals, with the
latter striving to explicate the relationship between the developing individual and his/her environment and the former seeking to exploit it.

Perhaps more importantly, half of the Human-tech framework, namely the “tech” half, is singularly focused on technology, while ecological systems theory fails to consider the impact of technology on development altogether. Of course, this is because Bronfenbrenner developed ecological system theory before the “Internet Revolution” (Johnson & Puplampu, 2008). Nevertheless, the impact of technology is glaringly absent from his theory. Still, it is clear that while the ecological systems model and the Human-tech framework differ in significant ways, they share more similarities than differences. (See Figure 3).

<table>
<thead>
<tr>
<th>POLITICAL (macrosystem)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORGANIZATIONAL (exosystem)</td>
</tr>
<tr>
<td>TEAM (microsystem or mesosystem)</td>
</tr>
<tr>
<td>PSYCHOLOGICAL (microsystem)</td>
</tr>
<tr>
<td>PHYSICAL (microsystem)</td>
</tr>
</tbody>
</table>

*Figure 3. Comparison of the Ecological Systems Model to the Human-tech ladder*
Bioecological theory.

Bronfenbrenner (2006) defined bioecological theory as “an evolving theoretical system for the study of human development” (p.793). As such, bioecological theory is a reconceptualization of ecological systems theory. However, bioecological theory differs from ecological systems theory in that Bronfenbrenner added two pivotal concepts including “proximal processes” and the “Process-Person-Context-Time” (PPCT) model.

Proximal processes were defined as “progressively more complex reciprocal interactions between an active, evolving, biopsychological, human organism and the persons, objects, and symbols in its immediate environment” (Bronfenbrenner & Ceci, 1994, p.317). Furthermore, Bronfenbrenner stated that these interactions had “to occur on a fairly regular basis over extended periods of time [in order to be] effective” (1994, p.317). Moreover, through the concept of proximal processes, Bronfenbrenner emphasized the role that the developing individual played in influencing his/her own development (Rosa & Tudge, 2013). Finally, Bronfenbrenner conceived of proximal processes as almost always acting in a beneficial way upon the developing individual, either in promoting positive characteristics or in diminishing negative traits (Rosa & Tudge, 2013).

Bronfenbrenner developed the PPCT model to illustrate how to conduct bioecological research (Rosa & Tudge, 2013). Through this model, Bronfenbrenner more fully explicated his understanding of the terms, “process,” “person,” “context” and “time.” His notion of “process” referred to the concept of proximal processes as was described above. It is important to note that in this concept, Bronfenbrenner not only considered an individual’s relationships with other people as the drivers of his/her
development but also took into account his/her interactions with “objects and symbols” (1994, p.317). However, Bronfenbrenner did not focus much attention on these interactions and wrote very little on the subject (Tudge & Marie Rosa, 2013). As such, bioecological theory, like ecological systems theory, largely ignored the impact of technology on development.

In Bronfenbrenner’s notion of the “person” he described three types of characteristics, which he termed “force,” “resource” and “demand” (Rosa & Tudge, 2013). Force characteristics were attributes that either sustained or disrupted proximal processes. For example, positive force characteristics (e.g., curiosity or self-initiative) were thought to sustain proximal processes, while negative force characteristics (e.g., impulsivity or distractibility) were thought to disrupt proximal processes (Rosa & Tudge, 2013). Resource characteristics were those that either supported or limited the developing individual’s capacity to engage in proximal processes. For example, positive resource characteristics (e.g., knowledge and skill) were thought to support one’s ability to engage in proximal processes, while negative resource characteristics (e.g., low birth weight or genetic defects) were thought to limit one’s ability to engage in proximal processes (Rosa & Tudge, 2013). Finally, demand characteristics referred to qualities that either encouraged or discouraged positive social reactions from the environment. For example, positive demand characteristics (e.g., an attractive personality or appearance) were thought to encourage proximal processes, while negative demand characteristics (e.g., unattractive personality or appearance) were thought to discourage proximal processes (Rosa & Tudge, 2013).
Bronfenbrenner’s concept of “context” referred to the multi-systemic model that he developed in ecological systems theory. However, in bioecological theory Bronfenbrenner made clear that proximal processes occurred within the microsystem, but that the other systems of context were also influential. Therefore, Bronfenbrenner’s notion of “context” in bioecological theory placed less emphasis on the impact of the outer systems (i.e., the exosystem and macrosystem) on the developing individual (Rosa & Tudge 2013).

Finally, the concept of “time” referred to the “chronosystem” or the outermost layer in the multi-systemic model, which Bronfenbrenner added to ecological systems theory in 1988, and broadened in bioecological theory (Rosa & Tudge 2013). In this concept, Bronfenbrenner (1999) included the influence of both ontogenetic and historical time on the developing individual as he said, “The individual’s own developmental life course is seen as embedded in and powerfully shaped by conditions and events occurring during the historical period through which the person lives” (p. 20).

**Ecological systems theory, bioecological theory and PDT.**

Bronfenbrenner’s theories of ecological systems theory and bioecological theory connect to PDT in several significant ways. As PDT allows educators and parents to exchange information about their students’/children’s learning and development, the tool acts as a kind of online mesosystem, bringing together the developing child’s previously separate Microsystems of the school and the home. Furthermore, PDT connects to the exosystem, as school administrators are able to access and influence this online mesosystem. Finally, PDT harnesses the developing child’s proximal processes, as the primary functions of the technology are to capture, share and reflect upon the meaningful
interactions students/children have with their learning environment. As such, PDT not only documents the proximal processes of the developing child but also capitalizes on them, thereby influencing his/her learning and development.

Summary (theories)

This section of the literature review focused on Bronfenbrenner’s ecological systems theory and bioecological theory, which underpin both the analytical tool I used to study PDT in Ontario’s Kindergarten Program (i.e., CWA) as well as PDT itself. First, ecological systems theory was described as it relates to CWA as both frameworks are “ecological” in nature and emphasize the “mutual reciprocity” between the developing individual and his/her environment (Tudge et al., 1996, p.96). Additionally, I discussed how ecological systems theory pertains to an adaptation of CWA, called the Human-tech framework (Vicente, 2003). More specifically, Bronfenbrenner’s multi-systemic model was compared to Vicente’s Human-tech ladder.

Following this discussion, I described bioecological theory, a later iteration of ecological systems theory. More specifically, I elucidated two pivotal concepts, which included proximal processes and the PPCT model. Finally, I connected ecological systems theory and bioecological theory to PDT. As such, PDT was conceptualized as a kind of online mesosystem, which brings together the developing child’s previously separate microsystems of the school and the home to document and share his/her proximal processes and, in turn, influence his/her development.

In the next section, I use Bronfenbrenner’s theories to examine the context out of which PDT was developed. More specifically, ecological systems theory and
bioecological theory are used to understand two early learning frameworks and settings, which include *Te Whāriki* in New Zealand and *The Kindergarten Program* in Ontario.

**Context**

Bronfenbrenner’s ecological systems theory and bioecological theory provided useful theoretical frameworks for understanding CWA and PDT. In this next section, these theories are employed to understand PDT use in Ontario’s Kindergarten Program. However, in order to fully comprehend this phenomenon, it is first necessary to consider the particular context out of which PDT was developed; namely early childhood educational (ECE) settings. Since this research study concerns a specific PDT (i.e., Storypark), which was developed in New Zealand, I first examine ECE in New Zealand and then discuss ECE in Ontario.

**New Zealand.**

New Zealand is internationally recognized as being “a world leader in ECE” (Blaiklock, 2017, p.38). Currently, over 95% of young children participate is some form of ECE before attending formal schooling and approximately 75% of early childhood educators hold a three-year degree or diploma (Blaiklock, 2017). Although the formal construct of ECE is relatively new in New Zealand, the provision of early learning and care for young children has existed for approximately 120 years (McLachlan, 2011). As such, New Zealand has a far-reaching history of developing policies and practices to support its youngest citizens.

The most recent evolution in ECE occurred in the mid 1980’s when New Zealand faced a fiscal and financial crisis (McLachlan, 2011). This crisis prompted substantial reform in education, which included transferring the care and education of young
children from the Department of Social Welfare to the Department of Education. The outcome of this reorganization was the creation of “an identifiable sector known as ECE,” which was integrated at a policy level (McLachlan, 2011, p.38). This, in turn, led to “a succession of new statutory requirements” as well as “a plethora of policy and guiding documents including a national early years curriculum called, *Te Whāriki*” (McLachlan, 2011, p.38).

*Te Whāriki*.

*Te Whāriki*, the world’s first national, bicultural curriculum for young children, was published in New Zealand in 1996 (New Zealand Ministry of Education, 1996). *Te Whāriki* literally means woven mat in Maori, the indigenous language of New Zealand, but it is also a metaphor for the developing child as “weaving a whāriki takes knowledge, skill and time and is almost always done collaboratively” (New Zealand Ministry of Education, 1996, p.10).

In *Te Whāriki*, children are positioned as “competent, confident learners from birth [who] learn by engaging in meaningful interactions with people places and things—a process that continues throughout their lifetimes” (New Zealand Ministry of Education, 1996, p.12). As such, *Te Whāriki* draws upon Bronfenbrenner’s concept of proximal processes to describe how young children learn and develop. Bronfenbrenner’s theoretical contributions can also be seen in the curriculum’s “four principles,” which serve as the pedagogical foundation of *Te Whāriki* and include empowerment, holistic development, family and community and relationships (New Zealand Ministry of Education, 1996).
First, the concept of proximal processes appears in the principle of empowerment, as young children are seen to “have agency to create and act on their own ideas, develop knowledge and skills in areas that interest them and, increasingly, to make decisions and judgments on matters that relate to them” (New Zealand Ministry of Education, 1996, p.18). Therefore, “play and playfulness are valued” in this principle as children are understood to use these means to drive their own development (New Zealand Ministry of Education, 1996, p.18). Second, ecological systems theory and the notion of “person,” as is explicated in the PPCT model, appears in the principle of holistic development, as the developing child is viewed “holistically,” with the physical, cognitive, emotional and spiritual aspects of his/her development “interwoven” and “interdependent” on the social and cultural dimensions of his/her environment (New Zealand Ministry of Education, 1996, p.19). Third, ecological systems theory and the concept of “context” are present in the principle of family and community as the “wider world of family and community” are emphasized as an integral part of development and “the well being of each child” is understood to be “interdependent on the well being of his/her kaiako (i.e., teachers), parents and whanau” (i.e., community) (New Zealand Ministry of Education, 1996, p.20). Finally, the concept of proximal processes appears in the principle of relationships, as children are understood to learn through “responsive and reciprocal relationships with people, places and things” (New Zealand Ministry of Education, 1996, p.21).

While Bronfenbrenner’s influence is implicit in Te Whāriki’s four principles, his models are also explicitly mentioned as “underpinning” much of the curriculum’s theoretical framework (New Zealand Ministry of Education, 1996, p.60). First, Te Whāriki refers to the “ecological systems model” as it states, “children’s learning is
located within the nested contexts and relationships of family, community and the wider local, national and global influences” (New Zealand Ministry of Education, 1996, p.60). Second, *Te Whāriki* references the “bioecological model” as it discusses “the reciprocal, individual-environmental influences that drive learning and development” (New Zealand Ministry of Education, 1996, p.61). As such, Bronfenbrenner’s notions of how young children learn and develop are a fundamental part of how ECE is understood and elucidated in New Zealand.

**Learning Stories.**

In addition to outlining pedagogical principles, *Te Whāriki* describes “five strands” (i.e., areas of learning), learning goals, outcomes as well as assessment practices. According to *Te Whāriki*, assessment is used to “make valued learning visible” or “to find out about what children know and can do, what interests them, how they are progressing, what new learning opportunities are suggested and where additional support may be required” (New Zealand Ministry of Education, 1996, p.63). In *Te Whāriki*, assessment happens both formally and informally. Informal assessment occurs “in the moment as kaiako listen, observe, participate with and respond to children who are engaged in everyday experiences and events,” while formal assessment takes place through “narrative forms such as learning stories” (New Zealand Ministry of Education, 1996, p.63).

Margret Carr, one of the authors of *Te Whāriki*, collaborated with colleagues to develop the “the learning story framework,” which is a “four-part assessment procedure” that is “underpinned by the four principles [and] woven by the [five] strands” (i.e., belonging, wellbeing, contribution, communication and contribution) (Carr, May &
Podmore, 2002, p.117). This procedure provided ECE practitioners with a formalized method to assess their young students’ progress as it pertained to the principles and strands that are outlined in the document. Originally, the learning story framework included: “describing” the child’s learning experience; “documenting” the child’s learning experience; “discussing” the child’s learning experience with the child, another practitioner and/or the child’s family; and “deciding” what to do about the child’s learning experience in terms of planning subsequent learning experiences (Carr, May & Podmore, 2002, p.115).

While there is “no set way” of writing a learning story, several features distinguish a learning story from other types of documentation (Alexander, 2013). First, it includes the educator’s interpretation of the child’s competencies or dispositions towards learning. Learning stories are, thus, subjective in nature and depend heavily upon the point of view of their author (Alexander, 2013). Second, learning stories are usually about what a child can do, rather than what he/she cannot do. Therefore, they are used to highlight the positive aspects of a child’s learning experience, rather than the negative (Alexander, 2013). Third, learning stories follow a general sequence of “noticing, recognizing, responding, recording and revisiting valued learning” (New Zealand Ministry of Education, 1996, p.63). Finally, learning stories are written for an audience such as the child, another practitioner, the child’s parents and/or his/her wider community as learning and development are understood to influence and be influenced by a multitude of relationships and contexts (New Zealand Ministry of Education, 1996).

Storypark, a digital documentation tool that was developed in consultation with seasoned ECE practitioners in New Zealand and global experts in ECE, allows educators
and parents to capture and share their students’/children’s learning through text, pictures, video and/or audio recordings. The tool was originally developed in 2011 in response to the assessment needs of early childhood educators following *Te Whāriki*. However, currently, Storypark is being used by over 7,000 ECE providers in 38 countries.

Storypark’s broad appeal lies in the versatility of its platform as it allows early years educators from all over the world to create learning stories, which connect to their particular curricula or “learning sets” as they are called on Storypark. As such, Storypark, like the advent of the learning story itself, “allows for [the] complexity” involved in documenting and assessing the holistic development of young children’s learning within a localized context (Andrt & Tesar, 2015, p.77). Moreover, its digital platform allows for faster documentation of children's activities, increased communication between parents and teachers, and greater attention to understanding children's interests and strengths, thereby facilitating a more efficient and effective assessment process (Alexander, 2013).

**Ontario.**

ECE in Canada, like ECE in New Zealand, has a long history of split systems wherein the care and education of young children have been overseen by the two separate ministries of Child and Youth Services and Education (Cleveland & Colley, 2013). However, while Canada is not as far along as New Zealand in terms of its integration efforts, it has made significant “conceptual and structural steps toward integrating [early childhood] care and education under education auspices” (Cleveland & Colley, 2013, p.188). Perhaps furthest along in this effort is the province of Ontario.
Ontario’s push towards developing an integrated system of early learning and care is due in large part to advocates and academics (Cleveland & Colley, 2013). In 1999 McCain and Mustard wrote *The Early Years Study*, which brought emerging brain research into the forefront of the policy discussion about childcare (Cleveland & Colley, 2013). Following this report, the Ontario government commissioned two subsequent *Early Years* reports as well as a guide to implementation called, *With Our Best Future in Mind: Implementing Early Learning in Ontario* (Pascal, 2009). This document, compiled by Early Years advisor Charles Pascal (2009), made several recommendations pertaining to ECE in Ontario, such as the development of: an integrated policy framework for children 0 – 12 years-old; full-day learning for four- and five-year-old children; extended-day programs for elementary school children; and child and family centres for children 0 – 3 years-old. Since the release of Pascal’s report, the Ontario government has adopted many of these recommendations including transferring the jurisdiction of child care programs to the Ministry of Education, developing an integrated early years policy framework and rolling out full-day kindergarten across the province (Cleveland & Colley, 2013).

**Ontario’s kindergarten curriculum**

In 2007, the Ontario government published a framework for ECE settings in Ontario called, *Early Learning for Every Child Today* or *ELECT*. In 2010, Ontario launched the Full-Day Early Learning Kindergarten Program based on this framework. In 2013 and 2014, Ontario released an *Early Years Policy Framework* as well as pedagogy for the early years called, *How Does Learning Happen?* By 2015, the Full-Day Early Learning Kindergarten Program was fully implemented throughout the
province. In 2016, Ontario released an updated curriculum document simply called, *The Kindergarten Program*. This document was based on *ELECT*, the *Early Years Policy Framework* as well as *How Does Learning Happen?*

Although Ontario’s kindergarten curriculum was developed for four and five-year-old children, it shares many similarities with New Zealand’s curriculum for children 0 – 4 years old. Like *Te Whāriki, The Kindergarten Program* positions young children as “capable and competent learners, full of potential and ready to take ownership of their learning” (Ontario Ministry of Education, 2016, p.6). Moreover, Ontario’s curriculum states, “The design of the kindergarten program starts with the understanding that children’s learning and development occur in the context of relationships with other children, parents and other family members, educators and the broader environment” (Ontario Ministry of Education, 2016, p.9). Therefore, *The Kindergarten Program*, like *Te Whāriki*, draws upon Bronfenbrenner’s multi-systemic model and the concept of proximal processes to elucidate the learning and development of young children.

*The Kindergarten Program* also mirrors *Te Whāriki* in that it is a competence-oriented model, which is focused on cultivating particular learning dispositions, or what Bronfenbrenner called “force” characteristics. This model differs significantly from the far-more-prevalent, performance-oriented model, which is centered on mastering specific tasks or subject areas (Bernstein, 1996). As is stated in *How Does Learning Happen?* (2014) about ECE curricula,

The focus is not on teaching a body of knowledge or a predetermined set of topics. Nor is it centered on children’s achievement of a specific skill set. In the early years, programs are most effective when the content of learning is focused on supporting the
development of strategies, dispositions and skills for lifelong learning through play and inquiry (p.15).

Therefore, The Kindergarten Program, like Te Whāriki, is built upon four foundational principles or “four frames,” which include: 1) Belonging and contributing, 2) Self-regulation and wellbeing, 3) Demonstrating literacy and mathematics behaviours and 4) Problem-solving and innovating (Ontario Ministry of Education, 2016, p.13). Moreover, many of the learning goals encompassed in the four frames correspond to the pedagogical objectives articulated in Te Whāriki’s four principles and five strands.

The Kindergarten Program and Te Whāriki are also alike in the pedagogical approaches they use to cultivate these learning “strategies, dispositions and skills” as responsive and reciprocal relationships, play-based learning and assessment are central to both curricula (Ontario Ministry of Education, 2016).

Early childhood practitioners employ responsive and reciprocal relationships in two different ways in The Kindergarten Program. First, they develop warm and trusting relationships with their students as the curriculum states, “Evidence shows that positive interactions between the teacher and student are the most important factor in improving learning” (Ontario Ministry of Education, 2016, p.11). Second, educators cultivate respectful and productive relationships with their students’ parents, as The Kindergarten Program understands parents to be the “first and most powerful influence on [their] children’s learning” (Ontario’s Ministry of Education, 2016, p.109).

In addition to developing responsive and reciprocal relationships, creating a “culture of inquiry” through play-based learning is a cornerstone of The Kindergarten Program as the curriculum states, “Global conversations on learning from various fields confirm that among pedagogical approaches, play-based learning emerges as a focal point
as it has proven benefits for learning among children of all ages” (Ontario Ministry of Education, 2016, p.12). As such, The Kindergarten Program lays out five “fundamental principles of play-based learning,” which include: 1) Recognizing play as a child’s right and “essential to the child’s optimal development,” 2) Understanding children as “competent, curious and capable of complex thinking,” 3) Viewing play, inquiry and exploration as the “primary drivers of learning among young children,” 4) Seeing “the learning environment [as] key [to] what and how a child learns” and 5) Using assessment as a means to “support the child’s learning and autonomy” (Ontario Ministry of Education, 2016, p.13).

Finally, The Kindergarten Program and Te Whāriki both use assessment as a pedagogical approach to supporting young children’s learning. As such, Ontario’s curriculum, like Te Whāriki, lays out how learning and development are assessed by kindergarten teachers and early childhood educators in the program. More specifically, The Kindergarten Program uses the term “pedagogical documentation” to refer to the “process of gathering and analyzing a wide range of evidence of a child’s thinking and learning over time and using the insights gained to make the child’s thinking and learning visible to the child and the child’s family” (Ontario Ministry of Education, 2016, p.36). Educators then use this evidence to “support further learning for each child in the most effective way possible” (Ontario Ministry of Education, 2016, p.36). Therefore, assessment in The Kindergarten Program is described as a tool “for learning, as learning and of learning” (Ontario Ministry of Education, 2016, p.11).
Pedagogical documentation.

Although the learning story framework is not specifically mentioned in The Kindergarten Program, it is evident from the description of pedagogical documentation that learning stories are a type of pedagogical documentation. As it is described in How Does Learning Happen? (HDLH, 2014), “Pedagogical documentation is about more than recording events—it is a means to learning about how children think and learn…and it encourages educators to be co-learners alongside both children and their families” (p.21). Moreover, this document states that pedagogical documentation is “a way to value children’s experiences and include their perspectives; a way to make children’s learning and understanding of the world around them visible to the children themselves; a process for educators to co-plan with children and with families; [and] a means of sharing perspectives with parents and colleagues” (HDLH, 2014, p.21). Therefore, pedagogical documentation is fundamentally subjective and highly collaborative as children and families are invited to contribute to the documentation process (HDLH, 2014). As the quality of pedagogical documentation is largely dependent upon the interpretations of students and their families, kindergarten educators in recent years have been looking to PDT to assist them in their pedagogical documentation efforts.

However, unlike New Zealand, which produced a specific PDT to facilitate the assessment practices of early childhood educators following Te Whāriki, Ontario has yet to develop such a tool. This is not to say kindergarten teachers and early childhood educators have not been using PDT in Ontario. In 2015, the Ontario Teacher’s Federation sponsored an action research project wherein a group of four early years teachers experimented with a variety of different documentation apps to support their
pedagogical documentation practices. While the project was deemed a “success,” as the technologies allowed educators to better organize their documentation as well as to reflect upon their students learning, no single PDT emerged as the solution to the educators’ assessment needs. Instead, the educators embraced the idea of using different tools for different purposes (Brown, LaPorte, Enns & Mulligan, 2015).

**Storypark and the kindergarten program.**

Anecdotal evidence from early childhood practitioners suggests that the vast majority of kindergarten teachers and early childhood educators in Ontario are unfamiliar with Storypark and, as such, have been turning to other PDT to support their pedagogical documentation practices. This is due in large part to the fact that Storypark has not made a concerted effort to market the PDT outside of New Zealand, Australia and Europe until recently. However, it is my contention that Storypark is uniquely well suited to meet the pedagogical requirements and practices of educators following *The Kindergarten Program* for several key reasons.

First, the design of Storypark began with what Vicente (2003) calls, “a problem worth solving” (p.45). In 2011, the mother of Storypark co-founder Jaime McDonald came to her web developer son with a “societal need” (Vicente, 2003, p.45). At the time, Lynda McDonald was running an early childhood centre in New Zealand and wanted a secure, online platform that would enable parents to become more involved in their children’s learning through the exchange of stories, photos and videos (Harding, 2014). Second, Storypark was developed in consultation with young children, early child practitioners and global experts in the ECE field. As such, Storypark was built by “tailoring the technology to specific, relevant human factors” (Vicente, 2003, p.45).
Finally, Storypark is rooted in the same pedagogical ideology as *The Kindergarten Program*. Therefore, the tool is highly aligned with the assessment values, needs and practices of kindergarten teachers and early childhood educators in Ontario.

**Summary (context)**

This section of the literature review examined the context out of which PDT was developed; namely ECE settings. Since this research study involves a specific PDT (i.e., Storypark), which was developed in New Zealand, I first examined the ECE context in New Zealand. More specifically, New Zealand’s national, bicultural early years curriculum, *Te Whāriki*, was discussed as it pertained to ecological systems theory and bioecological theory. Moreover, *Te Whāriki’s* formal assessment method, the learning story framework, was elucidated. Finally, Storypark, a PDT that was originally developed in response to the “societal need” of early childhood practitioners and parents in New Zealand, was touched upon.

Following this discussion, I reviewed the ECE context in Ontario. Similarities between ECE in New Zealand and ECE in Ontario were described. More specifically, I made theoretical comparisons between *Te Whāriki’s* four foundational principals and *The Kindergarten Program’s* four frames. Finally, I discussed parallels between *Te Whāriki* and *The Kindergarten Program’*s pedagogical approaches, as responsive and reciprocal relationships, play-based learning and assessment are central to both curricula.

In the next section, I review research, which is fundamental to early years policies and practices in Ontario, including *The Kindergarten Program*. This research is used to further elucidate the ECE context in Ontario as well as to provide a rationale for the use of PDT in Ontario’s Kindergarten Program. Additionally, I review existing research
pertaining to PDT in ECE in order to gain insight into how PDT might impact kindergarten educators, parents and students in Ontario.

**Research**

Early years policies and practices in Ontario are not only rooted in sound theoretical frameworks such as Bronfenbrenner’s ecological systems theory and bioecological theory, but also informed by a wealth of trans-disciplinary evidence from the science of early childhood development. The Effective Pre-school and Primary Education project or the EPPE project has been particularly influential in determining the course of ECE policies and practices in Canada and around the world. In this section of the literature review, I examine evidence from the EPPE project as it pertains to The Kindergarten Program in Ontario. More specifically, I examine the effects of the home learning environment on developmental outcomes and the impact of parental involvement in preschool as these findings provide a strong rationale for the use of PDT in Ontario’s Kindergarten Program. Finally, I discuss research pertaining to the use of PDT in ECE in order to gain a better understanding of how this phenomenon might impact kindergarten educators, students and parents in Ontario.

**The EPPE project.**

The EPPE project was the first large scale, European, longitudinal research study to demonstrate a direct link between preschool and long-term, developmental outcomes in children (Sylvia, Melhuish, Sammons, Siraj-Blatchford & Taggart, 2010). The study, which began in the late 1990’s in the United Kingdom, employed an educational effectiveness research design, which tracked the learning and development of 3,000 children between the ages of 3 and 11 years. Using a multi-level model, the EPPE
project sought to understand the various factors in children’s school and home environments, which influenced their development (Sylva et al., 2010).

While there have been other influential, large-scale studies on the long-term effects of preschool on children’s development, I chose to examine the EPPE project in particular because of the special attention it paid to the home learning environment. As such, the EPPE project did not simply focus its investigation on the impact of the preschool microsystem, but it gave equal consideration to the effects of the home microsystem. In doing so, the EPPE project was bioecological in its design in that it sought to understand the learning and development of young children as it occurred within their natural, complex, multi-systemic environment. As such, Bronfenbrenner’s direct influence is referenced by one of the authors of the study as she states, “The view of reciprocal influences between the child and the environment owes much to the work of Bronfenbrenner whose theory puts the child at the centre of a series of nested spheres of social and cultural influence, including home and education” (Sylva, 2010, p.1).

Home learning environment.

In assessing the impact of the home on developmental outcomes, the EPPE project inquired about a range of background characteristics and social demographics pertaining to children and their families (Sylva et al., 2010). In addition, parents were asked about the kinds of activities they engaged in with their children at home (Sylva et al., 2010). More specifically, researchers inquired about 14 home activity items, which included seven social/routine activities (i.e., playing with friends at home and elsewhere, visiting relatives/friends, shopping, TV, eating meals with family, regular bedtime) and seven home learning activities (i.e., frequency of being read to, going to the library,
playing with numbers, painting and drawing, being taught letters, being taught numbers and song/poems/rhymes) (Sylva et al., 2010). These 14 activity items were then individually tested using a regression analysis to see if they predicted over- or under- achievement.

In conducting analyses related to factors pertaining to the home learning environment, children’s background characteristics as well as their social demographics, several significant findings pertaining to this research study emerged: 1) The effects of the child’s background (i.e., factors pertaining to his/her family and home) were roughly twice as significant as any effects of preschool in influencing cognitive and social development (Sylva et al., 2010), 2) The home learning environment (i.e., the seven home learning activities) was “one of the most powerful influences upon children’s cognitive and social development” as it was found to have a stronger net effect on intellectual and social development than the net effect of parental occupation, education or income (Sylva et al., 2010, p.67) and, finally, 3) The home learning environment was significant “for all ethnic groups” and “the most powerful influence upon self-regulation, the aspect of children’s social development that most influences academic achievement” (Sylva et. al., 2010, p.67).

**Parental involvement in ECE settings.**

In addition to investigating the effects of the home learning environment on children’s development, the EPPE project explored the characteristics of effective early years practices and pedagogies (Sylva et al., 2010). This was done through a spinoff project called Effective Pedagogy in the Early Years (EPEY), which collected intensive, detailed qualitative and quantitative data from fourteen case studies of exemplary early
childhood settings (Siraj-Blatchford et al., 2002). The majority of these settings were selected on the basis of social, behavioural and cognitive outcomes from the EPPE project (Siraj-Blatchford et al., 2002).

In analyzing data gathered from naturalist observations of staff pedagogy, systematic observations of children’ learning, interviews with educators, managers and parents and a comprehensive document analysis, four significant themes pertaining to effective early years pedagogy emerged, which included: 1) Adult-child verbal interactions, 2) Differentiation and formative assessment, 3) Parental partnership and the home education environment and 4) Discipline and adult support in talking through conflicts (Siraj-Blatchford et al., 2002). As this section of the literature review is primarily concerned with evidence related to parental involvement in ECE settings, I will only elaborate on the third theme.

In examining the theme of parental partnership and the home education environment further, the EPEY project produced several significant findings related to this study: 1) “Sound learning took place even in the absence of consistently good pedagogic practice in the preschool setting…where there was a special relationship” between parents and educators in terms of shared educational aims (Sylva et al., 2010, p.160), 2) “Excellent” early childhood settings regularly shared child-related information between parents and educators. Moreover, in “excellent” settings, parents were often involved in decision making about their child’s learning (Sylva et al., 2010) and finally, 3) “Excellent” early years settings made significant efforts to encourage parental involvement in their children’s learning at school and at home (Sylva et al., 2010).
The EPPE project and the kindergarten program

The aforementioned findings have had a considerable influence on ECE policies and practices in Ontario. More specifically, parental or family involvement has become a central feature of early childhood programs as is described in principle two in ELECT, “Partnerships with families and communities strengthen the ability of early childhood settings to meet the needs of young children” (2007, p.6). The Kindergarten Program is no exception as it recognizes parents as the “first and most powerful influence on their children’s learning, development, health and well-being” (Ontario Ministry of Education, 2016, p.109). Moreover The Kindergarten Program states that “parents are an integral part of the Kindergarten program…as they are able to provide educators with important information that allows the educators to meet their child’s individual learning needs better” (Ontario Ministry of Education, 2016, p.109). As such, the curriculum document provides educators with a variety of suggestions to encourage family involvement in the program (Ontario Ministry of Education, 2016).

While the use of PDT is not specifically mentioned as a strategy to promote parental involvement in The Kindergarten Program, related suggestions are made such as: “Send parents brief descriptions of their children’s investigations in the classroom in hard copy or electronically and invite parents and families to converse with their children about their inquires;” and “provide a place for the parents to write both the children’s ideas and their own thoughts and reflections on the children’s work and ask them to send the comments back to school” (Ontario Ministry of Education, 2016, p.111). Therefore, it is evident that the function of PDT is highly aligned with one of the primary principles of The Kindergarten Program—to involve parents in their children’s learning.
Unfortunately, however, there is little evidence with respect the use of PDT in the kindergarten context as it is a relatively new phenomenon. Thus far, most of the research in this area has focused on the use of e-portfolios in primary, secondary and tertiary school settings (Goodman, 2013). However, “more recently e-portfolios have been introduced into the ECE context with the intention of supporting teachers and enhancing learning outcomes for young children through their simple, collaborative nature” (Goodman, 2015, p.2). As such, empirical evidence pertaining to e-portfolio use in ECE settings has begun to emerge. Not surprisingly, most of this research to date has been done in New Zealand.

**PDT in ECE.**

E-portfolios in the ECE context can be defined as “repositories for children’s learning stories” and/or online “platforms for engagement among teachers, children and parents” (Gallagher, 2018, p.24). In this respect, e-portfolios and PDT are one in the same. I chose to refer to this type of technology as PDT, rather than e-portfolios, mainly because the term PDT has more relevance for readers in Ontario.

Although there is a relatively small evidence base regarding the use of e-portfolios in ECE settings, studies thus far have indicated that the “increasingly interactive online environment offered through e-portfolios has overall tended to be conducive to building relationships between teachers and the child’s wider family unit” (Gallagher, 2018, p.25). Moreover, research on the impact of e-portfolios on young children’s engagement has shown e-portfolios to be supportive of children’s ownership of their learning and development (Goodman, 2015).
Goodman was among the first researchers to examine the use of e-portfolios in the ECE setting. In 2012, Goodman (2013) partnered with a provider of e-portfolio technology as a summer scholar at Victoria University to consider the impact of e-portfolios on parent and teacher engagement in young children’s learning. Using a mixed methods approach, Goodman (2013) sent a survey to over 1,500 managers, teachers and parents in 80 ECE centres across New Zealand. Additionally, Goodman (2013) conducted two case studies.

The results of Goodman’s (2013) survey revealed several significant findings related to this research study including: 1) Approximately two-thirds of teachers and parents/families and nearly 90% of managers felt e-portfolios helped to strengthen the relationships between parents and the centre “a great deal” or “quite a lot”, 2) Approximately two-thirds of parents, 75% of teachers and 80% of managers felt e-portfolios helped to strengthen communication between parents and the centre “a great deal” or “quite a lot”, 3) Approximately 75% of parents and over 90% of teachers and managers felt e-portfolios helped to strengthen parents’/families’ engagement with their children’s learning “a great deal” or “quite a lot” and 4) Approximately one-third of parents/families, two-thirds of management and nearly 50% of teachers felt e-portfolios helped to strengthen wider family members’ engagement with their children’s learning (Goodman, 2013).

In conducting case studies with two ECE centres, Goodman’s (2013) findings revealed four additional findings related to this research study including: 1) The use of e-portfolios made teachers more confident and involved in their students’ learning and, as such, more prepared to discuss their student’s learning with parents, 2) The use of e-
portfolios increased conversations between parents and teachers, 3) Teachers and parents enjoyed using e-portfolios to document children’s learning and 4) E-portfolios could be used as a mechanism to empower parents.

Although Goodman’s (2013) initial research project produced compelling findings with respect to the impact of e-portfolios on teachers’ and parents’ engagement in children’s learning, Goodman (2013) realized that her study failed to address the effects of e-portfolios on children themselves. As such, in 2015 Goodman conducted a follow-up research project to examine the ways in which young children engaged with their own learning through e-portfolios. This study was completed as Goodman’s (2015) Master of Education thesis and employed the same research method as her previous study (i.e., a national online survey and case studies).

In examining the ways in which young children engaged with their own learning through e-portfolios, Goodman (2015) emphasized three aspects, which she said were “critical to children’s engagement” (p.18). These aspects included ownership, partnership and accessibility. According to Goodman (2015), ownership developed when young children were “aware of the documentation process and of the different roles they could enact to contribute to [and in turn] own their learning” (p.18). Partnership pertained to the respectful and reciprocal relationships teachers and parents developed in order to “establish more learner-centred outcomes for children” (p.18). Finally, accessibly referred to both the physical availability of young children’s e-portfolios as well as the “intellectual accessibly,” as according to Goodman (2015) “assessment narratives [had to] reflect the different stages of the child and be relatable for [children] to revisit” (p.22).
Drawing upon these three critical aspects of young children’s engagement, Goodman (2015) developed questions for a national online survey, which she sent out to 2,315 early education, care and kindergarten services in New Zealand. Of this number, 77 eligible ECE centres completed the survey.

The results of Goodman’s survey revealed several significant findings related to this study including: 1) Thirty-five percent of centres posted learning stories once a week or more, while 59% posted learning stories once every two weeks to a month, 2) Eighty-two percent of centres provided children with access to their e-portfolios through computers, tablets or mobile phones, while 64% provided children with access to both online and hard copy versions of their portfolios. Ten percent of centres did not provide children with access to either online or hard copy versions of their portfolios and 3) Thirty-four percent of centres indicated that children visited their e-portfolios at least once or twice a week, while 45% reported that children engaged with their e-portfolios once every two weeks or less. Twenty-one percent of centres indicated that children never visited their e-portfolios.

In addition to asking questions about children’s engagement with e-portfolios at ECE centres, Goodman’s (2015) survey included questions pertaining to children’s engagement with their e-portfolios in the home learning environment. Therefore, Goodman (2015) asked about the connections that e-portfolios allowed children, parents and teachers to make between the centre and home. In response to this question, 35 respondents said they observed children making connections between the centre and home; 71 respondents said they observed parents making connections between the centre and home; 71 respondents said they observed parents making connections between the centre and home; 71 respondents said they observed parents making connections between the centre and home.
and the home; and in addition, 55 respondents said they observed teachers making connections between the centre and home (Goodman, 2015).

Finally, Goodman’s (2015) survey asked about the ways in which parents visited their children’s e-portfolios at home. In response to this question, 57% of centres indicated that parents read e-portfolios aloud to their children, 29% reported that parents allowed their children to access their e-portfolios on their own, 65% indicated that parents used e-portfolios to make connections to their children’s learning at home, 70% reported that parents used e-portfolios to contribute their own learning stories, 73% indicated that parents used e-portfolios to share their children’s learning with the wider community and finally, 29% reported that they did not know how parents visited their children’s e-portfolios at home.

Goodman’s case studies also provided significant findings related to this research study. In the first case study, which took place at a kindergarten for three- to five-year-olds, Goodman (2015) found that children had “strong ownership over their e-portfolios as they “regularly engaged with them alongside their teachers and peers” (p.61). Furthermore, Goodman (2015) found that through their e-portfolios “children competently engaged with and revisited their learning, [made] connections to prior experiences and [extended] their own learning and interests” (p.61)

However, in the second case study, which took place at a centre for children ages 18 months to school age, Goodman (2015) found that children did not have access to e-portfolios while at the centre and instead engaged with their hard copy portfolios. Despite this lack of accessibility, Goodman (2015) found that children still had “strong ownership” of their learning through their hard copy portfolios as they visited them on a
daily basis. Finally, Goodman (2015) found that while parents preferred that their children only have access to their hard-copy portfolios while at the centre, they still valued e-portfolios as an engagement tool.

Like Goodman, Higgins (2015) studied the use of e-portfolios at an ECE centre in New Zealand for her Master of Education thesis project. More specifically, Higgins (2015) employed a mixed-methods approach to investigate: 1) How e-portfolios facilitated communication between families and teachers in an ECE centre, 2) What types of communication were fostered between teachers and parents through the use of e-portfolios in an ECE centre and 3) What impact communication through the use of e-portfolios had upon the teacher-parent relationship and children’s ongoing learning. In this study, Higgins (2015) also conceptualized e-portfolios as a “mesosystem tool that connected the microsystems of the child’s home and early childhood setting” (p.6). Therefore, Higgins included both parents’ (i.e., 29) and teachers’ (i.e., 7) perspectives in her study.

Higgins’ (2015) research produced several significant findings related to this study including: 1) One hundred percent of parents indicated that e-portfolios helped them to understand their children’s learning at the centre “quite a lot” or “a great deal;” 2) Seventy-five percent of parents and 100% of teachers reported that e-portfolios helped to strengthen communication between the home and the centre “quite a lot” or “a great deal.” Moreover, participants reported that online communication via e-portfolios supported and enhanced face-to-face conversations between teachers and parents, teachers and teachers and parents and children about children’s learning; 3) One hundred percent of teachers and parents indicated that e-portfolios helped to strengthen the
teacher/parent relationship “quite a lot” or “a great deal;” 4) Forty-five percent of parents reported that they “seldom” or “occasionally” commented on learning stories, while 50% of parents indicated that they “never” added learning stories to their children’s e-portfolios; and 5) One hundred percent of teachers used learning tags to connect the curriculum to their learning stories.

Additionally, Higgins’ (2015) analysis of the types of communication that were fostered between teachers and parents through the use of e-portfolios revealed six categories of communication including: affirmation, providing further information, appreciation, conversational, links to potential follow up and asking a question. Through this analysis, Higgins’ (2015) found that parents chose to participate in “different levels of communication with teachers, which ranged from one-way to two-way communication” (p.75). As such, some parents valued the e-portfolio as “a tool for keeping them informed, rather than as a two-way communication tool” (p.75). Finally, Higgins’ analysis (2015) revealed that the quality of communication between teachers and parents ranged from surface to substantive, with surface dialogue pertaining to affirmative and appreciative comments that did not include specific details about a child and/or his/her learning, and with substantive dialogue referring to comments, which provided particular information to further the educator’s and/or parents’ understanding of the child and/or his/her ongoing learning.

Beaumont-Bates (2017) completed the most recent study on e-portfolio use in the ECE context in New Zealand. In this small scale, qualitative research project, Beaumont-Bates (2017) examined teachers’ and parents’ perspectives on whether e-portfolios could be used to support collaborative partnerships between teachers, parents, children and the
wider community. As such, Beaumont-Bates (2017) interviewed and sent questionnaires to five purposefully selected early childhood teachers and 16 parents.

Beaumont-Bates’ (2017) research revealed several significant findings related to this study including: 1) E-portfolios enhanced and supported the development of collaborative partnerships between teachers, parents, children and the wider community, 2) Two-way communication and the speed/frequency with which their children’s learning and development were communicated led to more effective collaborative partnerships, 3) E-portfolios alleviated the pressure to communicate at drop off/pick up times, as teachers and parents now had an alternative means to communicate, 4) Teachers responded more quickly to feedback from parents through e-portfolios due to the reciprocity of the platform, 5) Teachers felt better positioned to support and plan for an individual child’s learning and development when parents added to their child’s e-portfolio, 6) E-portfolios provided teachers with a better understanding of their students’ world beyond that of the classroom, which in turn, led to a more informed assessment, 7) E-portfolios supported parents to become more involved in their children’s learning, 8) E-portfolios increased conversations between parents and their children about the day and finally, 9) Partnerships with children improved as a secondary result of enhanced collaboration between teachers and parents.

Summary (research)

This section of the literature review examined three areas of research, which pertained to: 1) The effects of the home learning environment on developmental outcomes, 2) The impact of parental involvement in ECE settings and 3) The use of PDT in the ECE context.
The first two areas of research came from the EPPE project, which was a large-scale, longitudinal study that demonstrated a direct link between preschool and developmental outcomes (Sylva et al., 2010). I chose to review this study in particular because of the significant role it played in shaping ECE policies and practices in Ontario, including The Kindergarten Program. Moreover, the EPPE project used a bioecological approach and, as such, examined children’s development within the context of both the school and home microsystems. Through a review of the EPPE project, I highlighted several significant findings pertaining to the effects of the home learning environment on developmental outcomes as well as the impact of parental involvement in ECE settings. Most significantly, evidence showed that factors related to the child’s family and home learning environment were roughly twice as important as any factor related to preschool in influencing cognitive and social development (Sylva et al., 2010). This finding provided a strong rationale for the use of PDT in Ontario’s Kindergarten Program.

The third area of research examined in this section of the literature review pertained to the use of PDT in the ECE context. While most research in this area has focused on e-portfolio use in primary, secondary and tertiary settings, a small evidence base on the use of e-portfolios in ECE settings in New Zealand has begun to emerge (Goodman, 2015). As such, I examined four studies pertaining to the use of e-portfolios in the ECE context. Through this review, I presented compelling evidence related to the positive impact of e-portfolios on important areas related to the home-school connection, which included teacher-parent communication, teacher, parent, child and community partnerships and young children’s engagement in their own learning. These findings
provided insight into how PDT might affect kindergarten teachers, students and parents in Ontario.

Chapter Summary

In this chapter I reviewed three areas of literature that pertained to the research question: What are the lessons learned from using cognitive work analysis to implement and evaluate the use of a pedagogical documentation technology in Ontario’s Kindergarten Program?

First, I discussed theories, which were related to the method used to analyze PDT (i.e. CWA) in Ontario’s Kindergarten Program as well as to PDT itself. More specifically, concepts from Bronfenbrenner’s ecological systems theory were used to elucidate an adaptation of CWA, called the Human-tech framework. Additionally, Bronfenbrenner’s ecological systems theory and the concept of proximal processes were employed to understand the function of PDT. As such, PDT was conceptualized as a kind of online mesosystem, which allows educators and parents to capture and share the developing child’s proximal processes and, in turn, support his/her learning and development.

Ecological systems theory and bioecological theory were then used to understand the context out of which PDT was developed; namely, ECE settings. More specifically, I discussed ECE in New Zealand as the specific PDT (i.e., Storypark) that was used in this study was developed there. Following this discussion, ECE in Ontario was considered. Through this consideration, I made several parallels between The Kindergarten Program in Ontario and Te Whāriki in New Zealand.
Lastly, I presented research, which provided a rationale for the use of PDT in Ontario’s Kindergarten Program as well as insight into how this technology might impact kindergarten educators, students and parents in Ontario. More specifically, the EPPE project was examined to elucidate the effects of the home learning environment on developmental outcomes as well as the impact of parental involvement in ECE settings. Finally, evidence on the use of e-portfolios in the ECE context in New Zealand was reviewed.

In the next chapter I describe the methodical approach used in the research study, the rationale for using this approach as well as the research design. The research context, participants, timeline of the study, procedures for implementation, data sources, methods for data collection, methods for data analysis and ethical considerations are also discussed.
Chapter Three: Methodology

Chapter Overview

This chapter describes the methodology used to investigate the research question:

*What are the lessons learned from using cognitive work analysis (CWA) to implement and evaluate a pedagogical documentation technology (PDT) in Ontario’s Kindergarten Program?*  

As this study applied an adaptation of CWA (i.e., the Human-tech framework) to a design research protocol, I first provide descriptions of the methodological components involved in this approach: namely, CWA, the Human-tech framework and design research. Following these descriptions, I provide a rationale for using this particular research design to study a PDT in Ontario’s Kindergarten Program. Finally, I outline the research design, which includes the research context, participants, the procedures and timeline of the study, procedures for implementation, data sources, methods for data collection, methods for data analysis and ethical considerations.

Methodological Components

The methodology of this research study owes a great deal to the work of Nirula (2008) and MacKinnon (2009) who applied an adaptation of CWA (i.e., the Human-tech framework) to a design research protocol in order to examine the “Human-tech relationship” between a specific technology and a particular educational setting (Vicente, 200, p.33). MacKinnon (2009) used this methodology to understand the impact of an online research support forum on teacher education, while Nirula (2008) employed this approach to introduce hand-held technology to learning-disabled students in two elementary schools. In both cases, the researchers found this methodology useful not
only for understanding the complexity of their respective Human-tech settings but also for designing context-informed interventions to support these settings.

Cognitive work analysis.

As was mentioned in the previous chapter, CWA was developed for and by cognitive engineers in order to better understand the complex, sociotechnical “cognitive” work environments for which they were designing (Vicente, 1999). More specifically, Jens Rasmussen and his colleagues devised CWA while working at Risø National Laboratory in Denmark analyzing the origins of large-scale accidents at nuclear power plants. Through these analyses, Rasmussen concluded that most accidents occurred as the result of a combination of unexpected conditions (Roth & Bisantz, 2013). As such, Rasmussen developed CWA as a means of supporting ‘worker adaptability’ or the worker’s ability to perform his/her work in the midst of unanticipated situations (Roth & Bisantz, 2013).

One of the primary ways that CWA is able to support worker adaptability in this way is that the framework is ecological in nature (Fidel & Pejtersen, 2005). Therefore, CWA does not simply focus on understanding the central goals and tasks of the workers. It is also concerned with identifying factors within the work environment, or “work domain” as it is called in CWA, which affect worker productivity (Vicente, 1999). More specifically, CWA involves a detailed examination of the various constraints or limitations of the work domain that shape worker behaviour (Vicente, 1999) As such, CWA insists upon developing a thorough understanding of what is and is not possible so as to uncover the range of possibilities that are available to workers at any given moment. The end result of this in-depth analysis is a more flexible Human-tech system, which
allows for adaptability in the face of the unexpected and, in turn, a more resilient work environment (Roth & Bisantz, 2013).

CWA accomplishes the aforementioned analysis by identifying constraints in five areas of the work environment prior to the introduction of a new technology. These areas include: the work domain, control tasks, worker strategies, social-organization and worker competencies (Vicente, 1999). The work domain analysis examines the physical context in which the workers operate, the goals of the work environment as well as the means for achieving these goals (Roth & Bisantz, 2013). The control task analysis considers what needs to be done in the work domain. This includes understanding the various situations that may arise as well as identifying the work functions of the work domain (Roth & Bisantz, 2013). The worker strategies analysis examines the decisions workers need to make as well as the strategies they use to execute their tasks. The social-organizational analysis identifies how work is allocated, shared and/or coordinated within the work domain. Finally, the worker competencies analysis considers the perceptual and cognitive attributes, skills and/or challenges of individual workers (Roth & Bisantz, 2013).

The Human-tech framework.

As was mentioned in the previous chapter, Kim Vicente (2003) developed the Human-tech framework in response to observations he made about technology design as a human factors engineer. According to Vicente (2003), most technology is “out-of-sync with human society” because technology designers fail to consider the “Human-tech relationship” between their devices and the users of their devices (p.33). Therefore, Vicente argues (2003) that designers must adopt a Human-tech approach, which not only
focuses on the technical details of their designs but also examines the human context in which their designs are employed. To this end, the Human-tech framework not only involves the constraint-based analyses outlined above but also includes an examination of further sociological factors. Vicente (2003) organizes these factors into what he calls the “Human-tech ladder” (p.52).

The Human-tech ladder, as was previously mentioned, closely corresponds to the multi-systemic model outlined by Bronfenbrenner in ecological systems theory. As such, the Humantech ladder involves an in-depth examination of the constraints associated with the physical, psychological, team, organizational and political levels of a given work environment (Vicente, 2003). More specifically, the physical level examines the physical characteristics of the work environment; the psychological level identifies the thoughts, feelings and/or beliefs workers have about their work; the team level looks at the activities among and relationships between workers, including how workers communicate with each other about their work; the organizational level considers the internal structure of the work environment, including how decisions are made; and finally, the political level examines the wider cultural, legal and/or political context in which the workers are situated (Vicente, 2003)

**Design research.**

Design research, pioneered by Ann Brown in the 1990s, was developed as a means to conduct formative research to test and refine interventions in educational settings (Collins, Joseph & Bielaczyc, 2004). Prior to the development of design research, educational researchers lacked a methodology for adequately addressing “learning phenomena in the real world, rather than in a laboratory setting” (Collin et al.,
As such, design research “filled a niche in an array of experimental methods” to not only advance educational research methodologies but also improve educational practices (Collins et. al., 2004, p.21).

Collins et al. (2004, p.20) defined design research by contrasting it to laboratory-based educational research in seven significant ways. As such, Collins posited that design research: 1) Was “messy” rather than “well-defined” or “standardized,” and took place in settings that “characterized real life learning”, 2) Often had multiple dependent variables rather than a single dependent variable, 3) Did not attempt to control variables, but rather sought to understand the characteristics of the research situation, 4) Did not adhere to a fixed procedure, but rather followed flexible protocols, which were often revised depending upon their success, 5) Took place in complex, social settings involving constant social interaction, rather than in social isolation, 6) Did not test hypotheses, but rather developed a “qualitative and quantitative profile, which characterized the design in process” and 7) Involved the feedback and expertise of the research participants in the design process (p.20).

In addition to the aforementioned features, design research is characterized by a cyclical, iterative process, which involves progressive refinement of the research design (Collins et al., 2004). Therefore, most models of design research begin with a problem that needs to be solved (MacKinnon, 2009). To this end, design research is “inherently interventionist” as design researchers endeavor to “make something happen” (i.e., solve the problem) through a repeating cycle of implementation, analysis and modification (Bereiter, 2002, p.326).
Finally, design research is “characterized by emergent goals, [which] arise and evolve” over the course of the design cycle (Bereiter, 2002, p.326). In this way, design research “has a visionary quality” that is “driven by the potentialities perceived” by those involved in the research design process (Bereiter, 2002, p.326). As was noted above, research participants are frequently involved in the design process and, as such play an integral role in fulfilling the potential of the research design.

**The Rationale for the Research Design**

I decided to adopt a research approach similar to that of MacKinnon (2009) and Nirula (2008) to study PDT in Ontario’s Kindergarten Program for several reasons: 1) The study took place in a non-laboratory, “real life learning” setting (i.e.- kindergarten classrooms), and as such required a methodology that could accommodate the “messiness” involved in examining this context (Collins et al., 2004, p.20). 2) Currently, there are no known systematic studies done on the use of PDT in Ontario’s Kindergarten Program. Therefore, I was primarily concerned with “developing a qualitative and quantitative profile” of this phenomenon, rather than testing a particular hypothesis. 3) Similarly, because so little research has been done on the impact of PDT in ECE settings, I wanted to be able to include the feedback and expertise of the research participants in the research design. 4) The study involved the introduction of an information and communication technology into a multifaceted, cognitive work environment and, as such, required an analytic tool that could capture the complexity involved in such an effort. Finally 5) I was not only focused on examining the effects of PDT use in Ontario’s Kindergarten Program but also concerned with developing the best practices for this use. Therefore, the study was interventionist in nature as it sought to employ the design
research cycle to solve a societal problem (i.e., a lack of connection between the home and school learning environments).

**The Research Context**

The research study took place in 11 kindergarten classrooms at four different schools in a large, urban school district in Ontario. Parallel to this “real world” setting, I set up 11 online kindergarten classrooms through Storypark, which allowed kindergarten educators and parents to post learning stories about their students’/children’s learning. Parents only had access to learning stories about their own children, while educators only had access to learning stories about students at their own schools.

**Participants**

A total of 220 parents participated in the research study. Parents’ participation included using Storypark to view, comment on and/or post learning stories about their children’s learning. Of the 220 parents, 16 parents volunteered to be “point parents.” Each of the 11 participating classrooms had one to three point parent(s) who volunteered to participate in two semi-structured, individual interviews (i.e., CWA interviews and post interviews) and one online survey.

A total of 19 kindergarten educators also participated in the research study. Of the 19 kindergarten educators, 10 educators were kindergarten teachers (completed two years of teacher’s college post university) and 8 educators were ECEs (completed a college level ECE program post high school). As such, three out of the 11 participating classrooms were half classes wherein kindergarten teachers did not have teaching partners. Moreover, two of the kindergarten teachers went on maternity leave halfway through the research study. Therefore, two additional kindergarten teachers joined the
research study at that point. Kindergarten educators’ participation included using Storypark to post learning stories about their students’ learning and to view and/or to comment on parents’ learning stories. In addition, educators participated in an initial training, a classroom observation, two semi-structured, individual interviews (i.e., CWA interviews and post-interviews) and two online surveys.

Furthermore, a total of 3 principals participated in this study. The principals’ participation included using Storypark to view educators’ and parents’ learning stories as well as taking part in a semi-structured, individual CWA interview. Principals at Sites A and B completed full CWA interviews. The third participating principal was the principal at both Sites C and D and did not complete a full CWA interview due to scheduling difficulties. (See Appendix A for principal CWA questions).

Finally, 33 kindergarten students (ages 4 and 5 years-old) participated in post-intervention debriefing post-interviews. As such, three kindergarten students per classroom were interviewed. This interview consisted of viewing three learning stories about each child’s learning and then asking the students questions pertaining to these stories. Students were also asked questions about their educators’ and parents’ use of Storypark. (See Table 1 for summary of research participants).

Table 1

<table>
<thead>
<tr>
<th>SITE #</th>
<th>Teachers</th>
<th>ECEs</th>
<th>Point Parents</th>
<th>Principals</th>
<th>Students</th>
<th>TOTAL Interviewed</th>
<th>Participating Families</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
<td>5</td>
<td>9</td>
<td>1</td>
<td>15</td>
<td>35</td>
<td>113</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>6</td>
<td>13</td>
<td>38</td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>12</td>
<td>36</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>12</td>
<td>33</td>
</tr>
<tr>
<td>TOTAL</td>
<td><strong>11</strong></td>
<td><strong>8</strong></td>
<td><strong>16</strong></td>
<td><strong>3</strong> **   **</td>
<td><strong>33</strong></td>
<td><strong>71</strong></td>
<td><strong>220</strong></td>
</tr>
</tbody>
</table>

*Two kindergarten teachers went on maternity leave halfway through the study and were replaced by two different kindergarten teachers. **Sites C and D had the same principal.
Eligibility criteria.

Schools were eligible to participate in the research study if they were a part of the same large, urban school district in Ontario. Additionally, schools had to have the minimum requirements necessary to implement a PDT in their kindergarten programs. These requirements included access to technological devices such as digital cameras, smart phones and/or tablet computers as well as access to the Internet.

Kindergarten educators were eligible to participate in the research study if they were interested in using Storypark in their classrooms. If kindergarten classrooms consisted of a kindergarten teacher and an early childhood educator both educators had to be willing to participate in the study. Additionally, kindergarten educators had to be willing to participate in an initial training session, a classroom observation, at least two online surveys and at least two interviews.

Parents were eligible to participate in the research study if they had a kindergarten child in a classroom wherein the educators were participating in the study. Parents could become “point parents” if they were willing to use Storypark to view, comment and/or post learning stories about their child on a regular basis. Additionally, point parents had to be willing to participate in at least one online survey and at least two interviews.

Principals were eligible to participate in the research study if their school had the minimum requirements necessary to implement a PDT in their kindergarten program. They also had to have at least two kindergarten classrooms that were interested in participating in the study and be willing to participate in one interview.
Finally, students were eligible to participate in the research study if their educators were participating in the study and their parents consented to their participation in a one-on-one interview.

**Recruitment.**

I recruited research participants from Site A through a colleague who teaches in the large, urban school district in Ontario wherein the study took place. This colleague gave me the contact information of several educators who had participated in research projects in this large, urban school district in the past. Among these educators, one educator invited me to attend the monthly kindergarten team meeting at her school. After attending this meeting, five kindergarten teachers and five ECEs consented to participate in the study. After receiving consent from the educators, I contacted the principal at this site to obtain her consent.

I recruited research participants from Site B by approaching kindergarten educators at my son’s school. These educators invited me to attend their monthly kindergarten meeting. After attending this meeting, two kindergarten teachers and one ECE consented to participate in the study. After receiving consent from the educators, I contacted the principal at this site to obtain her consent.

Participants from Sites C and D were recruited through educators from Sites A and B who posted information about the research study on an online kindergarten teacher’s forum. After reading information about the study, a kindergarten teacher from Site C invited me to attend a joint kindergarten meeting at his school and an adjoining school (Site D). After attending this meeting, two kindergarten teachers and one ECE from each school consented to participate in the study. After receiving consent from the
educators, I contacted the principal at these sites (who was the principal at both schools) to obtain her consent.

I recruited parents to participate in the research study by sending information and consent forms to parents through the participating kindergarten educators. Parents (220) who permitted their children’s educators to use Storypark to document their children’s learning were sent an invitation to join Storypark via email. Parents who indicated that they would be willing to serve as a point parent in their child’s classroom (via the consent form) were contacted by phone and email to obtain their consent.

**School Characteristics.**

The Learning Opportunities Index (LOI) ranks schools based on external factors, which impact student success. These variables include income level, education level and marital status. The school that has the most external challenges is ranked first and is described as the highest on the LOI. Out of 471 schools, all four of the participating sites ranked in the high 300’s to low 400’s range on the LOI. Therefore, the families that participated in the research study were all of a similarly high socio-economic background.

**Research Procedures and Timeline**

As was previously mentioned, the original intention of the research design was to apply an adaptation of CWA (i.e., the Human-tech framework) to a design research protocol in order to understand and support the implementation and use of a PDT (i.e. Storypark) in Ontario’s Kindergarten Program. However, as design research does not follow “a fixed procedure, but rather relies on flexible protocols, which are revised
depending on their successes,” I made three significant changes to the initial research
design throughout the course of the study (Collins, 1999, p.20).

First, I decided to expand the size of the research study. Initially, I was going to
include only two kindergarten classrooms at two schools for a total of four kindergarten
classrooms. However, as several more kindergarten educators came forward wanting to
participate in the study, I decided to include 11 kindergarten classrooms at four different
schools.

Second, I decided to conduct CWA interviews both during and after Storypark
had been introduced into the kindergarten classrooms. Originally, I intended to interview
research participants prior to the introduction of Storypark so as to use this data to guide
the design research process. However, because the size of the research study increased
from eight kindergarten educators to 19, I did not have time to conduct all the CWA
interviews prior to the implementation of the technology. Therefore, the CWA
interviews were used more to inform subsequent rounds of data collection than to support
the implementation of specific design research interventions.

Finally, I decided to conduct post-interviews with kindergarten students. Initially,
I was going to interview only kindergarten educators, parents and principals. However,
unanswered questions from the post-interviews with kindergarten educators and parents
suggested that it would be beneficial to interview kindergarten students themselves. As
such, I decided to include the perspectives of kindergarten students as well. (See Table 2
for a summary of the research procedures and timeline).
### Summary of the Procedures and Timeline of the Research Study

<table>
<thead>
<tr>
<th>Time Period</th>
<th>What</th>
<th>Where</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept - Oct 2016</td>
<td>• Recruited research participants</td>
<td>Site A, B</td>
</tr>
<tr>
<td></td>
<td>• Sent out consent forms</td>
<td>Site A, B</td>
</tr>
<tr>
<td></td>
<td>• Conducted classroom observations</td>
<td>Site A, B</td>
</tr>
<tr>
<td></td>
<td>• Started CWA interviews with educators, parents and principal</td>
<td>Site A, B</td>
</tr>
<tr>
<td></td>
<td>• <strong>Amended research application to include more classrooms and sites</strong></td>
<td>University of Toronto, school board</td>
</tr>
<tr>
<td>Oct - Nov 2016</td>
<td>• Trained educators on PDT use</td>
<td>Site A, B</td>
</tr>
<tr>
<td></td>
<td>• Educators and parents started using PDT</td>
<td>Site A, B</td>
</tr>
<tr>
<td></td>
<td>• Continued CWA interviews</td>
<td>Site A, B</td>
</tr>
<tr>
<td></td>
<td>• Continued classroom observations</td>
<td>Site A, B</td>
</tr>
<tr>
<td></td>
<td>• Recruited research participants</td>
<td>Site C, D</td>
</tr>
<tr>
<td></td>
<td>• Sent out consent forms</td>
<td>Site C, D</td>
</tr>
<tr>
<td>Nov - December 2016</td>
<td>• Trained educators on PDT use</td>
<td>Site C, D</td>
</tr>
<tr>
<td></td>
<td>• Educators and parents started using PDT</td>
<td>Site B, C</td>
</tr>
<tr>
<td></td>
<td>• Continued CWA interviews</td>
<td>Site A, B, C, D</td>
</tr>
<tr>
<td></td>
<td>• Continued classroom observations</td>
<td>Site A, B, C, D</td>
</tr>
<tr>
<td>Time Period</td>
<td>Details</td>
<td>Sites</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
</tbody>
</table>
| Jan – Feb 2017      | - Educators and parents started using PDT  
- CWA interviews with educators, parents are principals are completed  
- Classroom observations are completed  
- CWA answer synthesis created  
- Webinar on PDT use at TDSB created and offered (based on CWA answer synthesis)  
- Educator survey 1 created and sent out (based on CWA answer synthesis)  
- Parent survey created and sent out (based on CWA synthesis) | Site C, D  
Site A, B, C, D  
Site A, B, C, D  
Site A, B, C, D  
Site A  
Site A  
Site A |
| Feb – March 2017    | - Educators and parents continue to use PDT  
- CWA answer syntheses created | Site A, B, C, B  
Sites B, C, D |
| March – April 2017  | - Educators and parents continue to use PDT  
- Educator survey 1 sent out (based on CWA answer syntheses)  
- Parent survey sent out (based on CWA answer syntheses)  
- Webinar on PDT use at TDSB offered but not implemented (due to “training overload”) | Sites A, B, C, D  
Sites B, C, D  
Sites B, C, D  
Sites B, C, D |
<table>
<thead>
<tr>
<th>Time Period</th>
<th>Activities</th>
<th>Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>April – May 2017</td>
<td>• Educators and parents continue to use PDT&lt;br&gt; • Post interview questions created (based on survey data)&lt;br&gt; • Started post interviews with educators and parents&lt;br&gt; • <strong>Amended research application to include student interviews (based on post-interview answers)</strong>&lt;br&gt; • Created and sent out educator survey 2 (based on post interview answers)</td>
<td>Sites A, B, C, D&lt;br&gt; Site A, B, C, D&lt;br&gt; University of Toronto, school board&lt;br&gt; Site A, B, C, D</td>
</tr>
<tr>
<td>May – June 2017</td>
<td>• Interviewed kindergarten students&lt;br&gt; • Continued post interviews with educators and parents</td>
<td>Site A, B, C, D</td>
</tr>
<tr>
<td>June 2017</td>
<td>• Completed student interviews&lt;br&gt; • Completed post interviews with educators and parents</td>
<td>Site A, B, C, D</td>
</tr>
</tbody>
</table>

**Procedures for Implementation**

A representative from Storypark provided an in-person, introductory training on how to use the basic functions of the PDT at each site. At least one kindergarten educator from each classroom attended the training. In the training, educators were shown how to post learning stories as well as how to tag learning stories with the Ontario *Kindergarten Program’s* curriculum expectations. Educators also had an opportunity to ask questions
and play around with the technology. While educators were provided with support in learning how to use the specific functions of Storypark, they were not given instructions on how to implement the technology within their own classrooms. This was purposefully left open to them.

Parents were also offered an introductory training on how to use Storypark at each site. However, in speaking to their students’ parents, educators did not believe this training was necessary. Therefore, parents learned how to use Storypark on their own.

After educators were trained in how to use Storypark, they were instructed to contact me as soon as they felt comfortable inviting their students’ parents to their online classrooms. Once the educators were comfortable with using the technology and all their students’ parents’ consent forms had been collected, I sent parents invitations to join Storypark via email.

A couple months after Storypark had been implemented at each site, another representative from Storypark offered a follow up webinar on how to use Storypark in the context of Ontario’s Kindergarten Program. However, only kindergarten educators from Site A attended the webinar. Educators at Sites B, C and D declined their webinars due to “training overload.” Accordingly, their webinars were offered later in the school year when they were also in the process of learning the new curriculum.

Data Sources

I collected several sources of data in the research study, which included: 1) A document analysis of materials that were relevant to Ontario’s Kindergarten Program, 2) Hour-long classroom observations in each of the 11 participating kindergarten classrooms, 3) CWA interviews with 19 kindergarten educators, 16 parents and 3
Data collection.

I gathered materials for the document analysis by reviewing Ontario’s 2016 Kindergarten Program curriculum document. Through this review I became familiar with several other relevant documents, which are listed in the reference section of this paper. Classroom observations were conducted using a template from Creswell (2008, p.225). As such, I took both descriptive and reflective field notes wherein I recorded the events that took place in the classroom as well as insights, ideas and themes. Data were recorded by hand as I took several pages of detailed field notes during each classroom observation. Data from the CWA interviews were collected using handwritten notes as well as an audio recording device. Audio recordings were then uploaded onto my computer and transcribed using Trint transcription software and a transcription service. Data from educator surveys 1 and 2 and data from the parent survey were collected using Survey Monkey survey software. Data from the post-interviews were collected using the same procedure that I used to collect data from the CWA interviews. Finally, quantitative and qualitative learning story data were collected via Storypark.

Data analysis.

Learning Stories.

Learning stories (i.e., pictures, text, audio and/or video recordings that educators and parents posted about their students’/children’s learning) were reviewed both qualitatively and quantitatively. I analyzed learning stories qualitatively by examining
the content of 50 of the most recently posted educator learning stories in each classroom (550) and all of the learning stories posted by parents (48). Since no known studies have been done to examine the content of learning stories, I developed my own categories of learning story themes for both educator learning stories and parent learning stories. Additionally, I drew upon Higgins’ (2015) categories of teacher-parent communication to identify the quality of communication of each learning story category (i.e., surface vs. substantive). Finally, I examined and coded parent comments about educator learning stories as well as educator comments about parent learning stories. To code these comments I, again, drew upon research conducted by Higgins (2015) who identified six main types of parent-educator comments: affirming, giving further information, appreciation, conversational, links to potential follow up and asking a question.

I analyzed learning stories quantitatively by examining statistical data, which were generated by Storypark. These data included: the number of learning stories posted by educators, the number of times parents viewed educator learning stories, the number of times parents commented on educator learning stories, the number of times parents responded to educator comments, the number of learning stories posted by parents, the number of times educators commented on parent learning stories, the number of times parents responded to educator comments and the number of times educators tagged their learning stories with learning tags. Qualitative data about learning tags (i.e., brief descriptions of The Kindergarten Program’s expectations) were not included because learning tags were set up differently at each site and, therefore, could not be compared across sites.
**Surveys.**

I created questions for the first educator survey based on the CWA answer syntheses. Since these responses were similar across sites, I sent out the same survey to educators at all four sites. Data from these surveys were first analyzed separately to see whether educators’ responses differed at each site. Once it was determined that educators’ responses were similar, the data were compiled and analyzed collectively.

Similarly, questions for the parent survey were based on the CWA answer synthesis. Responses to the parent survey were also similar across sites. As such, I sent out the same survey to parents at all four sites. Data from the four parent surveys were then analyzed separately to see whether parents’ responses differed at each site. Once it was determined that parents’ responses were similar, the data were compiled and analyzed collectively.

I created questions for the second educator survey based on the responses educators gave in the first educator survey. Again, because the answers to the first educator survey did not differ across sites, I sent out the same survey to educators at all four sites. This survey focused on educators’ use of Storypark for writing report cards. After analyzing the data from the second educator survey, I determined that it was not directly relevant to the primary purpose of the research study. Therefore, data from the second educator survey were not included in the results section of the study.

**Post-Interviews.**

I created questions for the post-interviews with educators and parents based on the responses educators and parents gave in the first educator survey and the parent survey, respectively. Audio recordings of the post-interviews with educators and parents were
transcribed and uploaded onto my computer. I then used NVivo qualitative analysis software to create nodes, or common themes, which pertained to the impact of Storypark on the home-school connection.

In analyzing the post-interview transcripts of educators and parents, I identified unanswered questions pertaining to the impact of Storypark upon kindergarten students. As such, I created questions for the post-interviews with students based on the responses educators and parents gave in their post-interviews. Audio recordings of the post-interviews with students were transcribed and uploaded onto my computer. Finally, I used NVivo qualitative analysis software to create nodes, or common themes, which pertained to how Storypark impacted kindergarten students.

**CWA.**

Three primary sources were used to create questions for the CWA interviews with principals, kindergarten educators and parents. These sources included: 1) The document analysis, 2) The 11 kindergarten classroom observations and 3) The research studies of Nirula (2008) and MacKinnon (2009). After the CWA interview questions were drafted, I conducted the interviews with principals, kindergarten educators and parents simultaneous to and after the introduction of Storypark into the work domain.

Due to the length and number of CWA interviews with principals, kindergarten educators and parents, I was not able to transcribe each CWA interview at the time that it was done. Instead, I created answer summaries of each interview using detailed, contemporaneous notes. These summaries were then synthesized into four educator answer syntheses (one per site), four parent answer syntheses (one per site) and one principal answer synthesis so as not to repeat answers. The educator and parent answer
syntheses were then used to create four Human-tech ladders (one per site). I decided not to include the principal answer synthesis in the four Human-tech ladders because the principal from Sites C and D was not able to complete a full CWA interview. Therefore, the principal at Sites C and D provided fewer interview responses than the principals at Sites A and B.

The four Human-tech ladders were created by categorizing educators’ and parents’ CWA interview responses into Vicente’s (2003) five Human-tech categories (i.e., physical, psychological, team, organizational and political) as was done in Nirula (2008) and MacKinnon (2009). However, unlike Nirula (2008) and Mackinnon (2009), who only included constraints (i.e., factors that limited workers’ abilities to do their work) in their Human-tech ladders, I also included affordances (i.e., factors that supported workers’ abilities to do their work). I coded CWA interview responses as constraints if they restricted educators’ and/or parents’ abilities to do their work (i.e., support their students’/children’s learning) and coded educators’ and parents’ CWA interview responses as affordances if they facilitated educators’ and/or parents’ abilities to do their work (i.e., support their students’/children’s learning) (See Appendix B for coding key).

After categorizing educators’ and parents’ CWA interview responses into Vicente’s (2003) five Human-tech categories as well as classifying them as constraints or affordances, I assigned negative values to constraints and positive values to affordances. This allocation allowed me to conduct constraint vs. affordance analyses in each Human-tech category across sites. (See next chapter for a further description of constraints vs. affordances analyses).
Upon the conclusion of the research study (i.e., June 2017), the CWA interviews with educators and parents were transcribed and uploaded onto my computer. I then used NVivo qualitative analysis software to create nodes or common themes, which pertained the five categories of Vicente’s (2003) Human-tech ladder (i.e., physical, psychological, team, organization, and political). These nodes were then used to categorize the CWA interview transcripts into the various Human-tech categories. Once categorized, I compared the data from the transcripts to the four Human-tech ladders, which were created using answer syntheses from the contemporaneous CWA interview notes. At that point, I added and/or omitted information to and/or from the Human-tech ladders to ensure accuracy.

After the Human-tech ladders were checked for accuracy, an external rater was employed to check for inter-rater reliability in the coding procedure (See Appendix C for external rater instructions). The external rater was trained in the coding procedure and then given several practice tests. Once the external rater was able to code the practice material to a criterion of 90% agreement with the author, she was given items from the actual Human-tech ladders to code. In coding these items, the external rater achieved a reliability rating of 90%. Discrepancies between the external rater and myself were resolved through discussion.

**Ethical Considerations**

Two separate ethics committee review boards approved the research design and protocol of this study. The Research Ethics Review Board at the University of Toronto and the External Research Review Committee at the school board wherein the study took place both approved my original thesis proposal as well as two amended versions of the
research study. In compliance with the ethical standards outlined by the ethics committee review boards, the identities of all the research participants who were involved in this study have been protected. The protocol number for this research study is #33054.

**Chapter Summary**

This chapter reviewed the methodology that was used to answer the question: *What are the lessons learned from using cognitive work analysis (CWA) to implement and evaluate the use of a pedagogical documentation technology (PDT) in Ontario’s Kindergarten Program?* First, I provided descriptions of the methodological components that were used in the research design including CWA, the Human-tech framework and design research. Following these descriptions, I provided a rationale for using this approach to study the aforementioned research question. Finally, I outlined the research design, which included the research context, participants, the procedures and timeline of the study, procedures for implementation, data sources, methods for data collection, methods for data analysis and ethical considerations.

In the next chapter I report the qualitative and quantitative results of the four primary sources of data including learning stories, surveys, post-interviews and CWA interview.
Chapter Four: Results

Chapter Overview

This chapter reports the results of the four primary sources of data including: qualitative and quantitative data from the learning stories, qualitative and quantitative findings from the online surveys from educators and parents, qualitative results from the post-interviews with educators, parents and students and qualitative and quantitative findings from the cognitive work analysis (CWA) interviews with educators and parents.

Learning Stories

Qualitative data from the learning stories were used to examine how educators and parents used a PDT (i.e., Storypark) to document and share their students’/children’s learning as well as to understand how educators and parents communicated about their students’/children’s learning. Quantitative data from the learning stories were used to determine the frequency with which educators used Storypark to post and tag learning stories as well as the frequency with which educators and parents communicated (via Storypark). The qualitative findings are reported first, followed by the quantitative results.

Learning stories (qualitative).

A qualitative analysis of the learning stories was conducted using NVivo qualitative analysis software. Since it was not feasible to include qualitative data from all the learning stories that educators posted (3,207), I selected 50 of the most recently posted learning stories from each classroom at each site to analyze (550). Additionally, I conducted a qualitative analysis of the parent learning stories from all four sites (48). In both analyses, I developed my own learning story content categories. I also drew upon
Higgins’ (2015) categories of parent-teacher communication to code the quality of communication of the learning stories (i.e., surface vs. substantive) as well as the comments about the learning stories. Since responses to parent and educator comments were infrequent, they were not included in the qualitative analyses. The overall qualitative results of the learning stories and comments are reported first, followed by the qualitative results of the learning stories and comments at each site.

**Educator learning stories (overall).**

In conducting a qualitative analysis of 550 educator learning stories, I identified four main categories including: 1) Self-explanatory (14%), 2) Descriptive (79%), 3) Directive (2%) and 4) In-depth (5%).

*Self-explanatory.*

“Self-explanatory” learning stories were stories in which educators posted a picture or video without providing any additional description or explanation. As such, “self-explanatory” was the most surface category of learning story. It was also the second most common category posted, as 14% of 550 learning stories were “self-explanatory.” Three different types of “self-explanatory” learning stories were identified including “untitled,” “titled,” and “child’s words.” Of these three types, “child’s words” was the most common type, while “untitled” was the least common.

“Untitled self-explanatory” learning stories were stories in which educators posted a picture or video of a child without a title. “Titled self-explanatory” learning stories were stories in which educators posted a picture or video with a one or two word title. For example, one educator posted a picture of two children wearing white lab coats and safety goggles and titled it, ‘Scientists.’ Finally, “child’s words self-explanatory”
learning stories were stories in which educators posted a quote from the child along with a picture or video of him/her. For example, in the story titled, ‘Robot’ one educator posted a picture of a student sitting next to a creation he built out of dominos and then wrote the child’s words, which were, “I used lots of dominos to build a robot. My robot has a mouth, nose, eyes, ears and hands.”

*Descriptive.*

“Descriptive” learning stories were stories in which educators provided a brief description of the learning and/or learning activity that a student was engaged in along with a picture or video of the student. As such, the quality of communication of “descriptive” learning stories ranged from surface to substantive. Overall, this was the most common category posted, as 79% of 550 learning stories were “descriptive.” Three types of “descriptive” learning stories were identified including “individual,” “group,” and “whole class.” Of these three types, “individual descriptive” was the most common type, while “whole class” was the least common.

“Individual descriptive” learning stories were stories about the learning process and/or product of an individual student. For example, in a story titled, ‘Build and Draw’ one educator posted a video of a child building a flower out of loose parts and then wrote, ‘Adele worked at the loose parts centre today to build a flower! She then looked at each part of the flower and drew what she saw. Adele also described all the different parts of a flower. Great work Adele!’

“Group descriptive” learning stories were stories about the learning process and/or product of a group of students. For example, in a story titled, ‘Testing Ramps,’ one educator posted two pictures of a group of students working together to build a ramp.
She then posted the words, ‘Luke, Rick, Walter and Ryan built a ramp with a metre stick. They tested to see if they could get the car down the ramp and into the tube. They succeeded several times!’

“Whole class descriptive” stories were stories about the learning process and/or product of the whole class. For example in a story titled, ‘Creating Our Store,’ an educator posted a series of pictures of students and then wrote, ‘Our students have been busy this week opening our class store. They took turns being managers and cashiers and managing the money. They named our store Best Buy and made a sign for it.’

**Directive.**

“Directive” learning stories were stories in which educators appealed to parents directly. As such, the quality of communication of “directive” learning stories ranged from surface to substantive. Overall, this was the least common category posted, as only 2% of 550 learning stories were classified as directive. Two types of “directive” learning stories were identified including “announcement” and “extension.” Both types of “directive” learning story were equally uncommon.

“Announcement directive” stories were stories in which educators made an announcement to parents. For example, in a story titled, ‘Todd Parr Inspired Self-Portraits’ one educator posted a picture of students’ work and then wrote,

> Please keep an eye out for artwork by your child inspired by Todd Parr. Along with the artwork is a fundraiser ordering form. Now you can order your child's artwork in a variety of formats such as cards, calendars etc. Bonus— [the money] goes towards the kindergarten and primary divisions at our school!
“Extension directive” stories were stories in which educators attempted to extend children’s classroom learning to the home environment. For example, in a story titled, ‘Tomato Plants Go Home’ one educator posted several pictures of his students’ tomato plants and then wrote,

Half of these tomato plant seeds went into outer space for six weeks. The Canadian Space Agency wanted us to plant them and see how many would sprout. The trick is they didn't tell us which package 'G' or 'H' contained the seeds from space. H – 23 out of 23 sprouted. G - 22 out of 23 sprouted. PLEASE PLANT THESE AND CONTINUE TO OBSERVE AND RECORD THE OBSERVATIONS IN THE PLANT JOURNAL!

In-depth.

“In-depth” learning stories were stories in which educators provided a more in-depth analysis of individual, group or whole class learning. As such, the quality of communication of “in-depth” learning stories was the most substantive of all learning story categories. Overall, this category was the second least common category posted, as 5% of 550 learning stories were “in-depth.” Two types of “in-depth” learning stories were identified including “student-focused” and “activity-focused.” Both types of in-depth learning stories were equally uncommon.

“Student-focused in-depth” learning stories were stories in which educators provided a more in-depth analysis of a particular student’s learning and/or behaviour. For example, in a story titled, ‘Kevin and Our City’ one educator posted a picture of two boys building together and then wrote,

Here’s Kevin playing with another student at our city we built. He plays very well with his classmates and,
unlike many other students, doesn’t only play with boys or with SKs. You can see how much it means to the other student, a JK, to be playing with Kevin as he is also very imaginative and patient and is a very good role model for the JKS and his fellow SKs.

Finally, “activity-focused in-depth” learning stories were stories in which educators provided a more in-depth analysis of a particular learning activity. For example, in a story titled, ‘Reading,’ one educator wrote,

Tammy was excited to read with her teacher today! She showed many early reading strategies. For example, before reading, she made predictions using the picture on the front of the book. With prompting, she was able to think about a possible problem in the story: ‘Maybe the boy will be scared to feed the horse, and then he won’t be scared anymore.’ When reading, Tammy used the sentence pattern to help her and was able to navigate a change in the sentence pattern by using the reading strategy ‘chunky monkey’ to break down an unknown word.

(See Table 3 and Figure 4 below for a summary and breakdown of educator learning story categories).

Table 3

<table>
<thead>
<tr>
<th>Category:</th>
<th>Self-explanatory</th>
<th>Descriptive</th>
<th>Directive</th>
<th>In-depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td>Untitled</td>
<td>Titled</td>
<td>Individual Group Whole Class</td>
<td>Announcement Extension</td>
</tr>
<tr>
<td>Quality of Communication:</td>
<td>Surface</td>
<td>Surface to substantive</td>
<td>Surface to substantive</td>
<td>Substantive</td>
</tr>
</tbody>
</table>
Figure 4. Breakdown of Learning Story Categories (Educator)

**Parent comments (overall).**

In analyzing the comments parents made about educator learning stories, I identified five main categories including: 1) Affirmation (52%), 2) Appreciation (13%), 3) Conversational (11%), 4) Connection (22%) and 5) Question/Suggestion (2%).

**Affirmation.**

Parents made “affirmation” comments to simply acknowledge an educator’s work, a learning activity and/or the child’s work. As such, “affirmation” comments were more surface than substantive in their quality of communication. For example, in response to a story about the ‘Th’ diagraph, one parent wrote, ‘This is great!!! It takes a lot of attention on their part to consider the th, ch and sh sounds!!!’ “Affirmation” comments were also comments parents made directly to the child. For example, in response to a story about a student writing the alphabet, the student’s parent wrote, ‘Good job Brent. Mommy and Daddy are very proud of you!’ Overall, “affirmation” was the most common category of parent comments.
Appreciation.

Parents made “appreciation” comments to express their appreciation of educators and/or their work. Therefore, “appreciation” comments were more surface than substantive in their quality of communication. For example, in response to a story about a student working on matching upper class letters to lower case letters, the student’s parent wrote, ‘Thanks for all your hard work Mrs. P and Mrs. C.’ Parents also made “appreciation” comments to thank educators for posting stories about their children’s learning. For example, in response to a story about a student learning about levers, the student’s parent wrote, ‘Thank you for sharing. She was saying something about a teeter-totter yesterday and we couldn't figure out. Now I get it.’ Overall, “appreciation” was the third most common category of parent comments.

Parents made “conversational” comments to add humour to the educator-parent interaction. As such, “conversational” comments were more surface than substantive in their quality of communication. For example in a story about the ‘Sh’ diagraph, one parent wrote, ‘I don’t think John really knows what shhh means...lol!! :).’ Overall, “conversational” was the second least common category of parent comments.

Parents made “connection” comments to connect their children’s classroom learning to their learning at home. Therefore, “connection” comments were more substantive than surface in their quality of communication. For example, in response to a story about a student playing a math game at school, a student’s parent wrote, ‘We have the Osmo system at home and Jake picked up very quickly on an adding game. He had to in order to save he fishes! His counting and number recognition is improving every day!’ Comments were also coded as “connection” comments if the child himself/herself made
comments in response to his/her educators’ learning story (via the parent). Overall, “connection” was the second most common category of parent comments.

Finally, parents made “question/suggestion” comments to better understand their children and/or their learning and/or to help educators better understand their children and/or their learning. As such, “question/suggestion” comments were more substantive than surface in their quality of communication. For example, in response to a story about a student learning how to write his name, the student’s parent wrote, ‘We are still reading books to Jake, without being directive, to start the process of decoding letters and words. I have a few pre-reading books, is this a good time to start with that rather than just reading AT him?’ Overall, “question/suggestion” was the least common category of parent comments. (See Table 4 and Figure 5 for a summary and breakdown of parent comment categories).

Table 4

Summary of Parent Comments

<table>
<thead>
<tr>
<th>Category:</th>
<th>Parent Comments:</th>
<th>Quality of Communication:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Affirmation</td>
<td>Surface</td>
</tr>
<tr>
<td></td>
<td>Appreciation</td>
<td>Surface</td>
</tr>
<tr>
<td></td>
<td>Conversational</td>
<td>Surface</td>
</tr>
<tr>
<td></td>
<td>Connection</td>
<td>Substantive</td>
</tr>
<tr>
<td></td>
<td>Question/Suggestion</td>
<td>Substantive</td>
</tr>
</tbody>
</table>
In conducting a qualitative analysis of all the learning stories parents posted (i.e., 48), I identified three categories including: 1) Descriptive (92%), 2) Directive (4%) and 3) Child-Initiated (4%).

**Descriptive.**

“Descriptive” learning stories were stories in which parents provided a description of their child and/or his/her learning along with a picture of him/her. As such, “descriptive” learning stories ranged in their quality of communication from surface to substantive. This was the most common category of parent learning story, as 92% were “descriptive.” Two types of “descriptive” learning stories were identified, including “experience-focused” and “learning-focused.” “Experience-focused descriptive” was more common than “learning-focused descriptive.”

“Experience-focused descriptive” stories were stories about special events and/or experiences that children participated in outside of school. For example in a story called, ‘Ava’s Fourth Birthday’ a parent posted a picture of her child blowing out candles on a birthday cake and then wrote, ‘Ava was very excited to celebrate her fourth
birthday. Ava helped make the rainbow cake with mommy. Each layer was a different colour. Her favourite colours are purple, pink and yellow.’

“Learning-focused descriptive” stories were stories about the learning that children did outside of school. Often this learning connected to learning children had done at school. For example in a story titled, ‘Simple Machines,’ a parent posted a picture of his child playing with Duplo blocks and then wrote,

Jake clearly enjoyed today's scientist visit. 
Spontaneously at dinner, he told me how simple machines make our lives easier. He named the wheel and inclined plane. Then demonstrated understanding by taking off the wheels of his Duplo plane to show me how it doesn't move as easily without the wheels. Attention, absorption, and comprehension! So exciting!

Directive.

“Directive” learning stories were stories in which parents appealed directly to educators to ask them a question about their child and/or their learning. As such, directive learning stories were more substantive than surface in their quality of communication. For example in a story titled, ‘Emotional Language’ a parent wrote,

Jake has been having a few crying fits in the past week, and struggling to explain the 'why' of what's happening. In some cases, he cried for 20 minutes straight and had to leave a restaurant on one occasion. His emotional language right now is fairly limited. He reports feeling 'sad' or 'hungry'. Wondering what the curriculum currently supports around developing emotional language?

“Directive” learning stories were uncommon as 4% of parent stories were directive.

Child-Initiated.
“Child-initiated” learning stories were stories that parents wrote on behalf of their children because their child wanted to share an experience or his/her learning with his/her educators. As such, “child-initiated” stories ranged in their quality of communication from surface to substantive. For example in a story titled, ‘Adding big numbers,’ a parent wrote, ‘Stefan was curious about the addition of big numbers. He kept on coming up with his own equations and asked for solutions. He wanted to share this with his teachers.’ “Child-initiated” learning stories were also uncommon as 4% of parent stories were child-initiated. (See Table 5 and Figure 6 for a summary and breakdown of parents learning story categories).

Table 5

*Summary of Parent Learning Stories (48)*

<table>
<thead>
<tr>
<th>Category:</th>
<th>Descriptive</th>
<th>Directive</th>
<th>Child-Initiated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td>Experience-focused</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Learning-focused</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality of Communication:</td>
<td>Surface to substantive</td>
<td>Substantive</td>
<td>Surface to substantive</td>
</tr>
</tbody>
</table>

*Figure 6. Breakdown of Learning Story Categories (Parent)*
**Educator comments (overall).**

In analyzing the comments educators made about parent learning stories, I identified four main categories including: 1) Affirmation (47%), 2) Answer (6%), 3) Informational (25%) and 4) Child-directed (22%).

**Affirmation.**

Educators made “affirmation” comments to acknowledge a child and/or his/her experience or learning. As such, “affirmation” comments were more surface than substantive in their quality of communication. For example, in response to a story about a child practicing his writing at home, an educator wrote, ‘So awesome!’ “Affirmation” was the most common category of educator comments.

**Answer.**

Educators made “answer” comments in response to questions parents posted in their stories. As such, “answer” comments were more substantive than surface in their quality of communication. For example, in response to the story titled, ‘Emotional Language,’ which was mentioned in the previous section, the educator wrote, ‘Emotional self-regulation is a term we are hearing of and learning more about. I suggest Stuart Shanker is the place/person to go to for some insight on Jake's developmental progress through self-regulation. He has excellent and accessible information on his website.’ “Answer” was the least common category of educator comments.

**Informational.**

Educators made “informational” comments to provide further information about a child, his/her learning and/or a learning activity. As such, “informational” comments were more substantive than surface in their quality of communication. For example, in
response to story about a child making letters out of chopsticks at a restaurant, one educator wrote, ‘An idea for a next step is to use the letter shapes he does know to read environmental print (labels, food wrappers, packaging, signs, flyers). When you see an "x" or another letter he has made with you, point it out, or have him try and find it (like an I Spy game).’ ‘Informational’ was the second most common category of educator comments.

*Child-directed.*

Lastly, educators made “child-directed” comments to address the child directly. As such, “child-directed” comments ranged from surface to substantive in their quality of communication. For example, in response to the story about a child writing math equations, which was mentioned in the previous section, an educator wrote, ‘You have been working hard Stefan. They are really big numbers! Which one do you think is the biggest number on your page?’ ‘Child-directed” was the second least common category of educator comments (See Table 6 and Figure 7 for summary and breakdown of educator comment categories).

Table 6

*Summary of Educator Comments*

<table>
<thead>
<tr>
<th>Category:</th>
<th>Educators’ Comments:</th>
<th>Quality of Communication:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Affirmation</td>
<td>Surface</td>
</tr>
<tr>
<td></td>
<td>Answer</td>
<td>Substantive</td>
</tr>
<tr>
<td></td>
<td>Informational</td>
<td>Surface to substantive</td>
</tr>
<tr>
<td></td>
<td>Child-directed</td>
<td>Surface to substantive</td>
</tr>
</tbody>
</table>

95
Educator learning stories (by site).

Site A.

Of all four categories of educator learning stories, educators at Site A posted the most “descriptive” learning stories. “Individual” was the most common type of “descriptive” learning story, while “whole class” was the least common. “Self-explanatory” was the second most common category of learning story with “child’s words” being the most common type and “untitled” being the least common. “In-depth” was the third most common category of learning story. Finally, of the 250 learning stories that were analyzed at Site A, no learning stories were coded as “directive.” (See Figure 8 for breakdown of educator learning story categories at Site A).
Of all four categories of educator learning stories, educators at Site B posted the most “descriptive” learning stories. “Individual” was the most common type of “descriptive” learning story, while “whole class” was the least common. “Self-explanatory” was the second most common category of learning story with “titled” being the most common type and “untitled” being the least common. Finally, of the 100 learning stories that were analyzed at Site B, no stories were coded as “directive” or “in-depth.” (See Figure 9 for a breakdown of learning story categories at Site B).
Site C.

Of all four categories of educator learning stories, educators at Site C posted the most “descriptive” learning stories. “Individual” was the most common type of descriptive learning story, while “whole class” was the least common. “Self-explanatory” was the second most common category of learning story with “titled” being the most common and child’s words being the least common. “In-depth” was the third most common category of educator learning story. Finally, of the 100 learning stories that were analyzed at Site C, no learning stories were coded as “directive.” (See Figure 10 for breakdown of learning story categories at Site C).

![Educator learning stories SITE C](image)

**Figure 10. Breakdown of Educator Learning Stories at Site C**

Site D.

Of all four categories of educator learning stories, educators at Site D posted the most “descriptive” learning stories. “Whole class” was the most common type of descriptive learning story, while “individual” was the least common. “Directive” was the second most common category of learning story, while “self-explanatory” was the third most common category. Finally, “in-depth” was the least common category of learning
story. (See Figure 11 for breakdown of learning story categories at Site D). (See Table 7 for summary of learning story categories at all four sites).

![Educator learning stories SITE D](image)

*Figure 11. Breakdown of Educator Learning Stories at Site D*

Table 7

*Summary of Educator Learning Stories at all Four Sites*

<table>
<thead>
<tr>
<th>Site/category</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-explanatory</td>
<td>18%</td>
<td>28%</td>
<td>15%</td>
<td>2%</td>
</tr>
<tr>
<td>Descriptive</td>
<td>75%</td>
<td>72%</td>
<td>80%</td>
<td>84%</td>
</tr>
<tr>
<td>In-depth</td>
<td>7%</td>
<td>0%</td>
<td>5%</td>
<td>1%</td>
</tr>
<tr>
<td>Directive</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>13%</td>
</tr>
</tbody>
</table>

*Parent comments (by site).*

*Site A.*

Of all five categories of parent comments, parents at Site A made the most “affirmation” comments. “Connection” was the second most common category of parent comments posted. “Appreciation” and “conversational” were the third and fourth most common categories posted, respectively. Finally, parents posted the least “question” comments. (See Figure 12 for breakdown of parent comments at Site A).
Figure 12. Breakdown of Parent Comments at Site A

Site B.

Of all five categories of parent comments, parents at Site B made the most “affirmation” comments. “Appreciation” was the second most common category of parent comments posted. “Connection” and “question” comments tied for the third most common category posted. Finally, parents posted the least “conversational” comments. (See Figure 13 for a breakdown of the categories of parent comments at Site B).

Figure 13. Breakdown of Parent Comments at Site B
Site C.

Of all five categories of parent comments, parents at Site C made the most “affirmation” comments. “Connection” was the second most common category of parent comments posted. “Appreciation” and “conversational” were the third and fourth most common categories, respectively. Finally, no comments were coded as “question” comments. (See Figure 14 for breakdown of categories of parent comments at Site C).

Figure 14. Breakdown of Parent Comments at Site C

Site D.

Of all five categories of parent comments, parents at Site D made the most “affirmation” comments. “Conversational” was the second most common category of parent comments posted. “Appreciation” and “connection” were the third and fourth most common categories posted, respectively. Finally, parents posted the least “question” comments. (See Figure 15 for a breakdown of the categories of parent comments at Site D). (See Table 8 for a summary of parent comment categories at all four sites).
Table 8

Summary of Parent Comment Categories at all Four Sites

<table>
<thead>
<tr>
<th>Site/category</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affirmation</td>
<td>55%</td>
<td>61%</td>
<td>45%</td>
<td>49%</td>
</tr>
<tr>
<td>Connection</td>
<td>24%</td>
<td>8%</td>
<td>36%</td>
<td>11%</td>
</tr>
<tr>
<td>Conversation</td>
<td>7%</td>
<td>4%</td>
<td>3%</td>
<td>23%</td>
</tr>
<tr>
<td>Appreciation</td>
<td>13%</td>
<td>19%</td>
<td>16%</td>
<td>14%</td>
</tr>
<tr>
<td>Question</td>
<td>1%</td>
<td>8%</td>
<td>0%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Parent learning stories (by site).

Site A was the only site in which parents actively posted learning stories (i.e., 40 out of 48 parent learning stories were posted at Site A). Therefore, the majority of educator comments were also posted at Site A. (See previous section for breakdown of parent learning story and educator comment categories).

Summary (learning stories qualitative).

Overall.

Four main categories of educator learning stories were identified including self-explanatory, descriptive, directive and in-depth. These categories ranged in their quality of communication from surface to substantive. “Self-explanatory” was the most surface.
category of educator learning story, while in-depth was the most substantive. Educators posted the most “descriptive” learning stories (79% of 550 learning stories) and the least “directive” learning stories (2% of 550 learning stories).

Five main categories of parent comments were identified including affirmation, appreciation, conversational, connection and question/suggestion. These categories ranged in their quality of communication from surface to substantive. “Affirmation,” “appreciation” and “conversational” comments were more surface than substantive in their quality of communication, while “connection” and “question/suggestion” comments were more substantive than surface. Parents posted the most “affirmation” comments and the least “question/suggestion” comments. However, “connection” was the second most common category of parent comments posted.

Three main categories of parent learning stories were identified including descriptive, directive and child-initiated. “Descriptive” stories ranged from surface to substantive in their quality of communication, while “directive” and “child-initiated” were more substantive than surface. Parents posted the most “descriptive” learning stories, as 92% of 48 were “descriptive.”

Four main categories of educator comments were identified including affirmation, answer, informational and child-directed. These categories ranged in their quality of communication from surface to substantive. “Affirmation” was the most surface category of educator comment, while “answer” was the most substantive. Educators posted the most “affirmation” comments as 47% of the comments analyzed fell into this category.
**By Site.**

Sites A and C followed a similar breakdown of educator learning story categories with “descriptive,” “self-explanatory” and “in-depth” learning stories making up the first, second and third most common categories posted, respectively. Moreover, Sites A and C posted the most “individual descriptive” learning stories and the least “whole class descriptive” learning stories. Additionally, these sites did not post “directive” learning stories.

Site B also posted the most “descriptive” learning stories with “individual” being the most common type of “descriptive” learning story and “whole class” being the least common. However, Site B did not post “in-depth” or “directive” learning stories.

Site D also posted the most “descriptive” learning stories. However, unlike the other three sites, Site D posted the most “whole class descriptive” learning stories and the least individual. Moreover, “directive” was the second most common category of learning story posted at Site D. “Self-explanatory” and “in-depth” learning stories made up 2% and 1% of Site D’s learning stories (out of 100), respectively.

“Affirmation” was the most common category of parent comments posted at all four sites, while “question” was the least common. “Connection” was the second most common category of parent comments at Sites A and C. “Appreciation” was the second most common category of parent comments at Sites B, while “conversational” was the second most common category of parent comments at Site D.

Finally, Site A was the only site that posted a substantial amount of parent learning stories (40 out of 48). As such, Site A was also the only site in which educators posted a substantial amount of comments about parent learning stories.
Learning stories (quantitative).

Quantitative data from educator and parent learning stories were used to determine the frequency with which educators used Storypark to post and tag learning stories and to identify the frequency with which educators and parents communicated (via Storypark). These data included: the number of learning stories educators posted, the number of times educators tagged learning stories, the number of times parents viewed educator learning stories, the number of times parents commented on educator learning stories, the number of times educators responded to parent comments, the number of learning stories parents posted, the number of times educators commented on parent learning stories and the number of times parents responded to educator comments. I first report the quantitative data overall and then report the quantitative data by site.

Use (overall).

Overall, educators used Storypark to post 3,207 learning stories over an average of 135 school days. To determine the frequency with which educators posted learning stories, I divided the total number of learning stories by the average number of school days that Storypark was used by the total number of educators. As such, educators posted an average of 24 learning stories per school day and an average of 1.25 learning stories per educator per school day.

Overall, educators tagged 3,207 learning stories with 4,413 learning tags. To determine the frequency with which educators tagged learning stories, I divided the total number of educator learning stories by the total number of learning tags used. Therefore, educators tagged their learning stories an average of 1.4 times for each learning story that was posted. (See Table 9 for a summary of educators’ use of Storypark overall).
Table 9

Summary of Educators’ Use of Storypark (Overall)

<table>
<thead>
<tr>
<th>All Sites</th>
<th>Total # of educator stories</th>
<th>Average # of school days used</th>
<th>Average # of stories posted per school day</th>
<th>Total # of educators</th>
<th>Average # of stories posted per educator per school day</th>
<th>Average # of tags used per story</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total:</td>
<td>3,207</td>
<td>135</td>
<td>24</td>
<td>19</td>
<td>1.25</td>
<td>1.4</td>
</tr>
</tbody>
</table>

**Educator-parent communication (overall).**

Overall, parents viewed educator learning stories 17,254 times and commented on them 1,444 times. Educators responded to parent comments on their learning stories 101 times. As such, parents viewed educator learning stories an average of 5.4 times for each story that was posted. Parents commented on educator learning stories an average of .45 times for each story that was posted. Finally, educators responded to parent comments an average of .07 times for each comment that was posted.

Overall, parents posted at total of 48 learning stories. Educators commented on parent learning stories a total of 68 times. Parents responded to educator comments on their learning stories 13 times. Therefore, educators commented on parent learning stories an average of 1.4 times for each story that was posted. Parents responded to educator comments an average of .19 times for each comment that was posted. Data on educators’ views of parent learning stories was not available and, therefore, not included. (See Tables 10 and 11 for summaries of the overall results of educator-parent communication).
Table 10

Summary of Educator-Parent Communication Overall (Totals)

<table>
<thead>
<tr>
<th>All Sites</th>
<th>Total # educator stories</th>
<th>Total # parent views</th>
<th>Total # parent comments</th>
<th>Total # educator responses</th>
<th>Total # parent comments</th>
<th>Total # parent responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total:</td>
<td>3,207</td>
<td>17,254</td>
<td>1,444</td>
<td>101</td>
<td>48</td>
<td>68</td>
</tr>
</tbody>
</table>

Table 11

Summary of Educator-Parent Communication Overall (Averages)

<table>
<thead>
<tr>
<th>All Sites</th>
<th>Average # parent views per educator story</th>
<th>Average # parent comments per educator story</th>
<th>Average # educator responses per parent comments</th>
<th>Average # educator comments per parent story</th>
<th>Average # parent responses per educator comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total:</td>
<td>5.4</td>
<td>.45</td>
<td>.07</td>
<td>1.4</td>
<td>.19</td>
</tr>
</tbody>
</table>

Use (by site).

Educators at Site A posted a total of 2,279 learning stories over the course of 159 school days. Educators at Site B posted a total of 274 learning stories over the course of 137 school days. Educators at Site C posted a total of 134 learning stories over the course of 130 school days. Finally, educators at Site D posted a total of 420 learning stories over the course of 113 school days.

To determine the frequency with which educators used Storypark to post learning stories at each site, I divided the total number of learning stories at each site, by the total number of school days that Storypark was used at each site by the number of educators at each site. As such, educators as Site A posted an average of 14.3 learning stories per school day and an average of 1.4 learning stories per educator per school day. Educators at Site B posted an average of 2 learning stories per school day and an average of .67 of a learning story per educator per school day. Educators at Site C posted an average of 1 learning story per school day and an average of .3 of a learning story per educator per
school day. Finally, educators at Site D posted an average of 4.6 learning stories per day and an average of 1.5 learning stories per educator per school day.

Educators at Site A used a total of 3,680 learning tags. Educators at Site B used a total of 1 learning tag. Educators at Site C used a total of 249 learning tags. Finally, educators at Site D used a total of 483 learning tags.

To determine the average number of learning tags educators used per learning story at each site, I divided the total number of learning tags by the total number of learning stories educators posted. Therefore, educators at Site A posted an average number of 1.6 tags per learning story. Educators at Site C posted an average number of 1.9 tags per learning story. Educators at Site D posted an average number of 1.2 tags per learning story. Finally, educators at Site B used one learning tag. (See Table 12 for a summary of educators’ use of Storypark by site).

Table 12

<table>
<thead>
<tr>
<th>SITE</th>
<th>Total # of educator stories</th>
<th>Average # of school days used</th>
<th>Average # of stories posted per school day</th>
<th>Total # of educators</th>
<th>Average # of stories posted per educator per school day</th>
<th>Average # of tags used per story</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2279</td>
<td>159</td>
<td>14.3</td>
<td>10</td>
<td>1.4</td>
<td>1.6</td>
</tr>
<tr>
<td>B</td>
<td>274</td>
<td>137</td>
<td>2</td>
<td>3</td>
<td>.67</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>134</td>
<td>130</td>
<td>1</td>
<td>3</td>
<td>.3</td>
<td>1.9</td>
</tr>
<tr>
<td>D</td>
<td>420</td>
<td>113</td>
<td>4.6</td>
<td>3</td>
<td>1.5</td>
<td>1.2</td>
</tr>
</tbody>
</table>

**Educator-parent communication (by site).**

At Site A, parents viewed educator learning stories 9,964 times and commented on them 766 times. Educators responded to parent comments about their learning stories 74 times. As such, parents at Site A viewed educator learning stories an average of 4.3 times for each story that was posted and commented on them an average of .3 times for
each story that was posted. Finally educators at Site A responded to parent comments an average of .1 times for each comment that was posted.

At Site B, parents viewed educator learning stories 1,750 times and commented on them 63 times. Educators responded to parent comments about their learning stories 0 times. Therefore, parents at Site B viewed educator learning stories an average of 6.4 times for each story that was posted and commented on them an average of .23 times for each story that was posted. Finally educators at Site B did not respond to parent comments.

At Site C, parents viewed educator learning stories 804 times and commented on them 46 times. Educators responded to parent comments about their learning stories 0 times. As such, parents at Site C viewed educator learning stories 4.4 times for each story that was posted and commented on them an average of .3 times for each story that was posted. Finally, educators at Site C did not respond to parent comments.

Lastly, parents at Site D viewed educators learning stories 4,736 times and commented on them 269 times. Educators responded to parent comments about their learning stories 27 times. Therefore, parents at Site D viewed educator learning stories an average of 11.3 times for each story that was posted and commented on them an average of .64 times for each story that was posted. Finally, educators at Site D responded to parent comments an average of .1 times for each comment that was posted. (See Tables 13 and 14 for summaries of educator-parent communication by site).
Table 13

**Summary of Educator-Parent Communication by Site (Totals)**

<table>
<thead>
<tr>
<th>SITE</th>
<th>Total # educator stories</th>
<th>Total # parent views of educator stories</th>
<th>Total # parent comments about educator stories</th>
<th>Total # educator responses to parent comments</th>
<th>Total # educator comments about parent stories</th>
<th>Total # parent responses to educator comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2279</td>
<td>9964</td>
<td>766</td>
<td>74</td>
<td>40</td>
<td>67</td>
</tr>
<tr>
<td>B</td>
<td>274</td>
<td>1,750</td>
<td>63</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>134</td>
<td>804</td>
<td>46</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>D</td>
<td>420</td>
<td>4,736</td>
<td>269</td>
<td>27</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>3,207</td>
<td>17,254</td>
<td>1,444</td>
<td>101</td>
<td>48</td>
<td>68</td>
</tr>
</tbody>
</table>

Table 14

**Summary of Educator-Parent Communication by Site (Averages)**

<table>
<thead>
<tr>
<th>SITE</th>
<th>Total # educator stories</th>
<th>Average # parent views per educator Stories</th>
<th>Average # parent comments per educator Stories</th>
<th>Average # educator responses per parent comments</th>
<th>Average # educator comments about parent stories</th>
<th>Average # parent responses to educator comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2279</td>
<td>4.4</td>
<td>.3</td>
<td>.1</td>
<td>1.7</td>
<td>.2</td>
</tr>
<tr>
<td>B</td>
<td>274</td>
<td>6.4</td>
<td>.23</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>134</td>
<td>6</td>
<td>.34</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>D</td>
<td>420</td>
<td>11.3</td>
<td>.64</td>
<td>.1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Parent learning stories.**

Parents at Site A posted 40 learning stories. Educators at Site A made 67 comments about parent learning stories or an average of 1.7 comments for each story that was posted. Parents responded to educator comments 13 times or an average of .2 times for each comment that was posted.

Parents at Site B posted five learning stories. Educators at Site B did not comment on parent learning stories.

Parents at Site C posted 2 learning stories. Educators at Site C did not comment on parent learning stories.
Finally, parents at Site D posted 1 learning story. Educators at Site D made one comment on this story. Parents did not respond to this comment.

**Summary (learning stories quantitative).**

**Use.**

Overall, 19 educators used Storypark to post 3,207 learning stories over an average of 135 school days. As such, educators posted an average of 24 learning stories per school day and an average of 1.25 learning stories per educator per school day. Educators at Site D posted the most learning stories as they posted an average of 1.5 learning stories per educator per school day. Educators at Site C posted the least learning stories as they posted an average of .3 of a learning story per educator per school day.

Overall, educators used 4,413 learning tags. Educators posted an average of 1.4 learning tags for each learning story that was posted. Educators at Site C used the most learning tags as they used an average of 1.9 tags for each story that was posted. Educators at Site B used the least learning tags as they only used one.

**Educator-parent communication.**

Overall, parents viewed learning stories 12 times more than they commented on them as they viewed educator learning stories an average of 5.4 times per story and commented on them an average of .45 times per story. Educators responded to parent comments an average of .07 times per comment. Educators commented on parent learning stories an average of 1.4 times per story. Finally, parents responded to educator comments an average of .2 times per comment.

Parents viewed learning stories the most at Site D as parents viewed educator learning stories an average of 11.3 times for each story that was posted. Parents viewed
learning stories the least at Site A as parents viewed educator learning stories an average of 4.4 times for each story that was posted. Parents also commented on educator learning stories the most at Site D as parents commented an average of .64 times for each learning story that was posted. Parents commented on learning stories the least at Site B as parents commented an average of .23 times for each learning story that was posted.

Of all four sites, Sites A and D were the only sites in which educators responded to parent comments about their learning stories. At these sites, educators responded to parent comments an average of .1 times for each comment that was posted. Furthermore, Site A was the only site in which parents posted a significant amount of learning stories (i.e., 40). Therefore, Site A was also the only site in which educators commented on parent learning stories, except for Site D, which had one educator comment.

Surveys

Surveys were used to further examine how educators and parents used a PDT (i.e., Storypark) in Ontario’s Kindergarten Program as well as to understand how this use impacted the home-school connection. Survey questions were developed from the responses educators and parents gave in their CWA interviews. Only overall survey findings (as opposed to survey results by site) are reported in this section due to a lack of data from the smaller sites (i.e., Sites B, C and D). Findings from the educator survey are reported first, followed by the results of the parent survey.

Educator Survey.

The educator survey was sent out to 19 kindergarten educators four to six months after Storypark was implemented at the sites. (See Appendix D for educator survey). The survey contained questions related to educators’ use of Storypark as well as
questions related to the impact of Storypark on: educators’ teaching practices, educator’s understanding/use of Ontario’s Kindergarten Curriculum, educators’ relationships to their students’ parents and educators’ relationships to their students. In addition, I asked, “What else would you like to say about your use of Storypark?” Survey questions that did not yield relevant data with respect the impact of Storypark on the home-school connection were eliminated from my analysis and are, therefore, not included in the results section.

**Use (educator survey).**

The educator survey asked three questions related to educators’ use of Storypark including: 1) “How often do you usually use Storypark?” 2) “For what purpose(s) do you use Storypark?” and 3) “What else would you like to use Storypark for?” Educators’ responses to these questions are detailed below.

**Question 1 – How often do you usually use Storypark?**

The most common response to this question was “a few times per week” as nine out of 19 educators gave this answer. Four educators said they used Storypark “a few times per day.” Two educators said they used Storypark “one time per day.” One educator said he/she used Storypark “one time per week” and one educator said he/she used Storypark “less than one time per week.” No educators said they did not use Storypark. Finally two educators answered “other” to this question and then provided the following comments: 1) “I may go on it once [a week] but add many stories in that time.” 2) “In spurts. Sometimes several times per day, sometimes several days go by without using it.”
Question 2 – *For what purpose(s) do you use Storypark?*

The most common response to this question was to “share individual student learning with parents” as 15 out of 19 educators answered this way. Fourteen educators said they used Storypark to “document individual student learning” and 14 educators said they used Storypark to “tag students learning with the kindergarten curriculum’s expectations.” Thirteen educators said they used Storypark to “share classroom learning with parents.” Ten educators said they used Storypark to “document classroom learning.” Six educators said they used Storypark to “reflect upon their teaching practices.” Five educators said they used Storypark “to write report cards.” Five educators said they used Storypark to “plan and/or collaborate with their teaching partners.” Four educators said they used Storypark to “plan teaching activities.” Finally, three educators said they used Storypark to “share student learning with students.”

Question 3 - *What else would you like to use Storypark for?*

The most common response to this question was “to write report cards” as nine out of 19 educators answered this way. Five educators said they would like to use Storypark to “document classroom learning.” Five educators said they would like to use Storypark to “share student learning with students.” Five educators said they would like to use Storypark to “plan teaching activities.” Four educators said they would like to use Storypark to “reflect upon their teaching practices.” Four educators said they would like to use Storypark to “plan and/or collaborate with their teaching partners.” Three educators said they would like to use Storypark to “document individual student’s learning.” Two educators said that they would like to use Storypark to “share classroom learning with parents.” Finally, two educators said they would like to use Storypark to
“tag student learning with the kindergarten curriculum’s expectations.” One educator made an additional comment in response to this question, which was as follows: “I don't use Storypark.”

**Impact (educator survey).**

The educator survey asked educators four questions with respect to the impact of Storypark on the home-school connection including: 1) “How is Storypark impacting your teaching practice?” 2) “How is Storypark impacting your understanding/use of *The Kindergarten Program* curriculum?” 3) ”How is Storypark impacting your relationships to your students’ parents?” and 4) ”How is Storypark impacting your relationships to your students?” Additionally, I asked a fifth question, which was: 5) “What else would you like to say about your use of Storypark?” Educators’ qualitative responses are detailed below, followed by a table, which summarizes the quantitative results.

**Question 1 –How is Storypark impacting your teaching practice?**

Educators made nine comments in response to this question, which were as follows: 1) “I’m more aware of what I’m covering.” 2) “It makes me more accountable to document student learning equally.” 3) “Clearly see their growth.” 4) “I am learning how to balance being behind technology with just interacting with students. I do think it is a benefit in terms of documentation.” 5) “I enjoy having documentation of student activities and sharing them with parents.” 6) “Right now it's a great parent communication tool, but as it progresses I'm hoping it will make writing reports easier and that it will organize my practice a bit.” 7) “I am learning the curriculum through using Storypark.” 8) “I find I am able to look at children's progress and reflect on their
growth.”  9) “Being able to link to the curriculum has helped me explain to parents the learning that's happening.”

Question 2—How is Storypark impacting your understanding/use of The Kindergarten Curriculum?

Educators made eight comments in response to this question, which were as follows:  1) “Really has made me learn the expectations AND find the expectation that best reflects the learning.”  2) “Has made me aware of all the expectations a lot quicker than the last document.”  3) “Helping me learn the new terminology and frames of the curriculum.”  4) “It's in my face.”  5) “I haven't used it in that way”.  6) “As I tag the curriculum expectations for each story I am growing more and more familiar with the curriculum.”  7) “The ability to tag the learning with the curriculum has allowed me to observe the vastness of learning across my lessons.”  8) “Helped me learn it much quicker.”  9) “Have become more familiar with the four frames and expectations.”

Question 3—How is Storypark impacting your relationships to your students’ parents?

Educators made 10 comments in response to this question, which were as follows:  1) “Parents can see what play-based learning is in action AND how what their children do connects back to curriculum.”  2) “Most parents enjoy seeing the stories come home. I have had a couple parents wondering why they aren't coming home more often or why I am not responding to their stories/comments (which was never an expectation of mine).”  3) “Parents are very positive about knowing what their child has been doing.”  4) “Communication back and forth with those who are interested.”  5) “Positive impact of their children's learning during the day.”  6) “Parents enjoy being informed as to activities
in the classroom.” 7) “The parents love it and it makes them feel included in their child's learning. That makes for a more communicative relationship with parents and that's good.” 8) “They are seeing what their child is learning in the classroom.” 9) “Parents are more engaged and children's learning is evident.” 10) “Most enjoy receiving updates.”

Question 3—How is Storypark impacting your relationships to your students?

Educators made 11 comments in response to this question which were as follows:

1) “Students know that when I take a photo they are demonstrating learning, AND that their parents will see.” 2) “Students love creating stories.” 3) “I feel that I am interacting with them more and trying to document a variety of learning activities.” 4) “Longer conversations about their learning.” 5) “I generally don't share the stories with the kids... this is something I need to get better at.” 6) “They always want me to take pictures and send it to their parents.” 7) “I can show my appreciation of their activities.” 8) “The kids are constantly coming to me and asking me to take a picture of their work so they can show their parents and I think it really helps all of us celebrate their work.” 9) “The students like to be documented.” 10) “Children are asking to have their work photographed and shared with their families. They are proud to show off their work.” 11) “Students ask more to have photos posted and look forward to explaining their activities and learning.”

Question 4—What else would you like to say about your use of Storypark?

In response to this question educators made the following four comments: 1) “It is a great way of having ongoing communication with the parent and students as well.” 2) “As I get used to using it more it will definitely be a very helpful tool for report writing and interviews especially. 3) “Storypark is an excellent tool to document and present
students’ learning!” 4) “Generally, I feel that the best part of Storypark so far has been the way that it has made parents feel included in their child's learning and that has made parents more relaxed and made for more interesting discussions at report time. Also the fact that they are viewing what is going on in the class, [which] is making for less surprises at report time and I am hoping that Storypark will help prepare parents for the language and intent of the new curriculum.” (See Table 15 below for quantitative results of the educator survey).

Table 15

*Quantitative Results of Educator Survey*

<table>
<thead>
<tr>
<th>QUESTIONS:</th>
<th>(+)</th>
<th>Somewhat (+)</th>
<th>Neither (+) nor (-)</th>
<th>Somewhat (-)</th>
<th>(-)</th>
<th>Skipped or N/A</th>
<th>% of educators who said SP had a (+) or somewhat (+) impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP’s impact on teaching practice</td>
<td>10</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>18 / 19</td>
</tr>
<tr>
<td></td>
<td>~53%</td>
<td>~42%</td>
<td>0%</td>
<td>0%</td>
<td>~15%</td>
<td>0%</td>
<td>~95%</td>
</tr>
<tr>
<td>SP’s impact understanding/use Ontario’s kindergarten curriculum</td>
<td>11</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>15/19</td>
</tr>
<tr>
<td></td>
<td>~60%</td>
<td>~20%</td>
<td>~20%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>~80%</td>
</tr>
<tr>
<td>SP’s impact on relationships to students</td>
<td>11</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>15/19</td>
</tr>
<tr>
<td></td>
<td>~60%</td>
<td>~20%</td>
<td>~20%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>~80%</td>
</tr>
<tr>
<td>SP’s impact on relationships to students’ parents</td>
<td>11</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2 skipped ~10%</td>
<td>16/17</td>
</tr>
<tr>
<td></td>
<td>~60%</td>
<td>~25%</td>
<td>~5%</td>
<td>0%</td>
<td>0%</td>
<td>~10%</td>
<td>~85%</td>
</tr>
</tbody>
</table>
Summary (educator survey).

Use.

Findings from the educator survey showed that the majority of educators used Storypark a few times per week or more. However, one educator said that he/she did not use Storypark.

Results also revealed that educators primarily used Storypark to document and share individual student learning with parents and to tag student learning with The Kindergarten Program’s expectations. Second to documenting and sharing individual student learning with parents, findings showed that educators used Storypark to document and share classroom learning with parents. After that, educators used Storypark to reflect on their teaching practices, write report cards, communicate and/or collaborate with their teaching partner and plan teaching activities. A small minority of educators (i.e., 3 out of 19) used Storypark to share student learning with students.

Lastly, findings showed that approximately half of educators wanted to start using Storypark to write report cards. Furthermore, approximately a quarter of educators wanted to start using Storypark to document classroom learning, share student learning with students and plan teaching activities.

Impact.

Results from the educator survey showed that Storypark had either a “positive” or “somewhat positive” impact on approximately 95% of educators’ teaching practices. More specifically, findings revealed that Storypark helped educators to: become more aware of what they were teaching, become more accountable in documenting their students equitably, see their student’s growth more clearly, reflect upon their students’ progress, learn Ontario’s new kindergarten curriculum and communicate the kindergarten
curriculum to their students’ parents. However, findings also showed that Storypark had a negative impact on one educator’s teaching practice.

Additionally, results revealed that Storypark had either a “positive” or “somewhat positive” impact on approximately 80% of educators’ understanding of Ontario’s kindergarten curriculum. More specifically, results showed that Storypark helped educators to: become more familiar with The Kindergarten Program’s expectations and “four frames,” learn the curriculum document faster and observe their teaching practices. However, one educator commented that he/she did not use Storypark to connect his/her learning stories to the curriculum document.

Findings also showed that Storypark had either a “positive” or “somewhat positive” impact on approximately 85% of educators’ relationships to their students’ parents. More specifically, results showed that Storypark: increased parents’ awareness of what their child was learning about in the classroom, increased parents’ understanding of play-based learning, helped parents to feel more included in their child’s learning, helped parents to feel more engaged in their child’s learning and created a more communicative relationship between educators and parents. However, results also revealed that educators and parents had different expectations with respect to the amount of stories and comments educators should post.

Findings also showed that Storypark had either a “positive” or “somewhat positive” impact on approximately 80% of educators’ relationships to their students. More specifically, results showed that Storypark: helped students to demonstrate their learning, helped students to talk about their learning with their parents, increased educators’ interactions with their students, increased the length of conversations
educators had with their students about their learning, helped educators to celebrate and show appreciation for their students’ work and increased pride in students with respect to their work.

Finally, in response to the question, “What else would you like to say about your use of Storypark?” results showed that Storypark was a helpful tool for: documenting and presenting student learning, having ongoing communication with parents, making parents feel more included in their children’s learning and deceasing parents’ anxiety with respect to their children’s learning.

**Parent Survey.**

The parent survey was sent out to 16 parents four to six months after Storypark was implemented at the sites. (See Appendix E for Parent Survey). The parent survey contained questions related to parents’ use of Storypark as well as questions related to the impact of Storypark on: parents’ understanding of their child’s learning in the classroom, parents’ level of involvement in their child’s learning at home, parents’ level of communication with their child’s educators, the child and parents’ relationship to their child’s educators. In addition, I asked parents how satisfied they were with their child’s educators’ use of Storypark. Survey questions that did not yield useful data with respect the impact of Storypark on the home-school connection were eliminated from my analysis and are, therefore, not included in the results section.

**Use (parent survey).**

I asked six questions pertaining to parents’ use of Storypark including: 1) “How often do you usually use Storypark?” 2) “Who in your household usually uses Storypark?” 3) “For what purposes do you currently use Storypark?” 4) “What else
would you like to use Storypark for?” 5) “How often do you comment on the stories your child’s educators post?” and 6) “How often do you post a story about your child’s learning?” Parents’ responses to these questions are detailed below:

Question 1—*How often do you usually use Storypark?*

The most common response to this question was “less than one time per week” as six out of 16 parents provided this answer. Five parents said they used Storypark “a few times per week.” Four parents said they used Storypark “one time per week.” Lastly, one parent answered “other” to this question and then provided the following comment: “When I get notified of a post.”

Question 2—*Who in your household usually uses Storypark?*

The most common response to this question was “me and my partner only” as seven out of 16 parents answered this way. Four parents answered, “Only me.” Two parents answered, “Me, my partner and my child.” One parent answered, “Me and my child only.” One parent answered, “Me, my partner, my child and other family members.” Finally, one parent answered “other” to this question and then provided the following comment: “All three parents in our co-parenting group.”

Question 3—*For what purposes do you currently use Storypark?*

The most common response to this question was “To see what my child is learning about in the classroom” as 13 out of 16 parents gave this answer. Eight parents responded, “To comment on stories my child’s educators post.” Seven parents responded, “To extend or reinforce my child’s classroom learning at home.” Six parents responded, “To see how my child’s day is going.” Six parents responded, “To get a better sense of Ontario’s kindergarten curriculum.” Five parents responded, “To monitor
the progress my child is making in terms of his/her learning.” Two parents responded, “To post stories about my child’s learning at home.” One parent responded, “To monitor my child’s behaviour in the classroom.” One parent responded, “To share my child’s learning with family and friends.” Finally, no parents said they did not use Storypark. One parent made an additional comment in response to this question, which was as follows: “To communicate developmental observations with the teaching staff.”

Question 4—*What else would you like to use Storypark for?*

The most common response to this question was, “To extend and/or reinforce my child’s classroom learning at home” as nine out of 16 parents answered this way. Seven parents answered, “To share my child’s learning with family and friends.” Seven parents answered, “To plan/collaborate with my child’s educators.” Five parents answered, “To get a better understanding of Ontario’s kindergarten curriculum.” Five parents answered, “To post stories about the child’s learning at home.” Four parents answered, “To see what my child is learning in the classroom.” Four parents answered, “To monitor the progress my child is making in terms of his/her learning.” Three parents answered, “To see how my child’s day is going.” Three parents answered to comment on stories that my child’s educators post.” Two parents answered, “To monitor my child’s behaviour in the classroom.” Finally, two parents answered, “I don’t want to use Storypark for anything else.”

Question 5—*How often do you comment on the stories your child’s educators post?*

The most common response to this question was “sometimes” as five out of 16 parents answered this way. Four parents answered, “not very often.” Three parents
answered, “often.” Two parents answered, “all the time.” Finally, two parents answered, “Never.”

In addition, parents posted five comments in response to this question, which were as follows: 1) “With the one exception, comments were never communicated to my child.” 2) “I had planned to do this, but haven't yet.” 3) “I try to comment on all of the posts that have my daughter only in them. It is kind of a pain when the whole class is tagged and parents comment because your phone ‘blows up’ :).” 4) “Unclear who reads posts and if comments are expected or welcomed.” 5) “I haven't felt like there was much that needed to be said.”

Question 6—“How often do you post a story about your child’s learning?”

The most common response to this question was “never” as 9 out of 16 parents gave this response. Four parents answered, “Not very often.” Finally, three parents answered, “Sometimes.”

In addition, parents posted six comments in response to this question, which were as follows: 1) “I would like to do this more, I just haven't had the time to set it up.” 2) “I can do this? Oops!” 3) “Didn’t know we were supposed to.” 4) “Stories were not acknowledged/commented on by the teacher, therefore, there was no perceived value in posting them.” 5) “Given the small audience (for me it was just the teachers, as I was unable to get grandparents to sign up), I really only felt compelled to share unusual experiences from learning at home, which happened more rarely.” 6) “Not sure who is reading or if it is appropriate.”
Impact (parent survey).

The parent survey asked parents six questions with respect to the impact of Storypark on the home-school connection including: 1) “How has your use/your educators’ use of Storypark impacted your understanding of your child’s learning in the classroom?” 2) ‘How has your use/your educators’ use of Storypark impacted your understanding of Ontario’s kindergarten curriculum?’ 3) “How has your use/your educators’ use of Storypark impacted your level of involvement in your child’s learning at home?” 4) “How has Storypark impacted your relationship to your child’s educators?” 5) “How has Storypark impacted your level of communication with your child’s educators?” 6) “How has Storypark impacted your child?” Parents’ qualitative responses to these questions are detailed below, followed by a table, which summarizes the quantitative results.

Question 1—How has your use/your educators’ use of Storypark impacted your understanding of your child’s learning in the classroom?

Parents made five comments in response to this question, which were as follows: 1) “I expected it to give me a glimpse into his day.” 2) “Without this, I would have almost no idea of what is going on in the classroom.” 3) “My daughter always says ‘nothing’ when we ask what she did that day. We try creative questions, but hard to get things out of her.” 4) “It's a window into classroom activities.” 5) “With more frequent postings my understanding would greatly increase.”

Question 2—How has your use/your child’s educators’ use of Storypark impacted your understanding of Ontario’s kindergarten curriculum /play-based learning?
Parents made five comments in response to this question, which were as follows:
1) “I don't know much about the curriculum, so nice to see what they are doing in class and get a better idea of the expectations (which are often tagged).”
2) “The learning tags helps to understand and link to the curriculum.”
3) “Curriculum was fairly well explained at parent night, in communications sent home and at parent-teacher conference. Seeing the curriculum in action has reinforced my understanding a little bit.”
4) “With more frequent postings my understanding would greatly increase.”
5) “It reinforced what I already understood of the curriculum.”

Question 3—How has your use/your child’s educators’ use of Storypark impacted your level of involvement in your child’s learning at home?

Parents made five comments in response to this question which were as follows:
1) “It's a conversation starter.”
2) “I can now refer to a pic I saw, and she will expand on what she was doing in class/with who etc.”
3) “Common things to talk about with our child.”
4) “We tend to focus at home on learning and activities different from school.”
5) “With more frequent postings my level of involvement would greatly increase.”

Question 4—How has Storypark impacted your relationship to your child’s educators?

Parents made two comments in response to this question, which were as follows:
1) “Hasn't impacted it at all.”
2) “We already have a positive relationship.”

Question 5—How has Storypark impacted your level of communication with your child’s educators?

Parents made four comments in response to this question, which were as follows:
1) “The teachers are accessible and open to all forms of communication.”
2) “When they
post, I get a notification. I guess this is a form of communicating with me indirectly.” 3) “I have the chance to chat with my child's teachers regularly at drop-off/pick-up.” 4) “With more frequent postings my level of communication would greatly increase.”

Question 6—How has Storypark impacted your child?

Parents made four comments in response to this question, which were as follows:
1) “I am not sure if she is aware I even use it.” 2) “I think the teacher has shown her my comment at least once.” 3) “Haven't really looked at it together. I should.” 4) “I don't really think that it changed anything for him.” (See Table 16 below for summary of the quantitative results of the impact of Storypark on parents)

Table 16

Summary of Impact of Storypark on Parents

<table>
<thead>
<tr>
<th>Questions</th>
<th>(+)</th>
<th>Somewhat (+)</th>
<th>Neither (+) nor (-)</th>
<th>Somewhat (-)</th>
<th>(-)</th>
<th>Skipped question or N/A</th>
<th>% of parents who said SP had a (+) or somewhat (+) impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP’s impact on parents’ understanding of their child’s classroom learning</td>
<td>2</td>
<td>12</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>14/16 (≈90%)</td>
</tr>
<tr>
<td>SP’s impact on parents’ understanding of Ontario’s Kindergarten Curriculum?</td>
<td>0</td>
<td>11</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>11/16 (≈70%)</td>
</tr>
<tr>
<td>SP’s impact on parents’ levels of involvement in child’s learning at home</td>
<td>0</td>
<td>9</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>9/16 (≈55%)</td>
</tr>
</tbody>
</table>
I asked parents one question with respect to their level of satisfaction with their child’s educators’ use of Storypark, which was, “How satisfied are you with your child’s educators’ use of Storypark?” The qualitative responses to this question are detailed below, followed by a table, which summarizes the quantitative results.

Parents made four comments in response to this question, which were as follows:

1) “It would be nice to have updates more often, but I understand they are busy. However, other teachers provide feedback almost daily to the parents (either through emails or twitter or blogs).”
2) “Good amount of posts - not too many or too few. They also use Twitter, so I like the combo.”
3) “I felt happy with the volume and content of posts from the teachers. I would have posted more content of my own if I had been able to get my son's grandparents to sign up.”
4) “I expected more frequency, more detail, more back and forth. Not very personal.”

(See Table 17 below for a summary of parents’ level of satisfaction with their child’s educators’ use of Storypark).
Table 17

Summary of Parents’ Level of Satisfaction

<table>
<thead>
<tr>
<th></th>
<th>Very Satisfied</th>
<th>Somewhat satisfied</th>
<th>Indifferent</th>
<th>Somewhat dissatisfied</th>
<th>Very dissatisfied</th>
<th>% parents who said they were very or somewhat satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>12/16 (75%)</td>
</tr>
</tbody>
</table>

**Summary (parent survey).**

**Use.**

Results from the parent survey revealed that the majority of parents used Storypark less than a few times per week, primarily to see what their child was learning about in the classroom.

Findings also revealed that the majority of parents commented on educator learning stories either sometimes, not very often or never. Parents said they did not comment on educator learning stories for the following reasons: they did not receive comments from educators about their child’s learning, they did not know who read their comments and they did not know whether or not parent comments were welcomed and/or expected by educators.

Results also showed that the majority of parents never posted their own learning stories. Parents said they did not post learning stories for the following reasons: they did not know they could post learning stories, they did not know whether or not it was expected and/or appropriate, their child’s educators did not comment on the learning stories that they did post, they did not know who read their learning stories, they could not get extended family to sign up for Storypark and they did not have time.
Findings also revealed that the majority of parents used Storypark by themselves or with their partner as only 25% used Storypark with their child. Moreover, only one parent used Storypark with his/her partner, child and other family members.

Finally, results showed that the majority of parents wanted to start using Storypark to extend and/or reinforce their child’s classroom learning at home. Moreover, approximately 45% of parents wanted to start using Storypark to share their child’s learning with family and friends and to plan and/or collaborate with their child’s educators.

**Impact.**

Findings from the parent survey showed that Storypark had either a “positive” or “somewhat positive” impact on approximately 90% of parents’ understanding of their child’s classroom learning. More specifically, results revealed that Storypark gave parents a “window” into their child’s day and that, without Storypark, parents would have “no idea” what their child was learning about in the classroom. However, one parent commented that more frequent postings would increase his/her understanding of his/her child’s classroom learning.

Results also showed that Storypark had a “somewhat positive” impact on approximately 70% of parents understanding of Ontario’s kindergarten curriculum. More specifically, findings showed that learning stories reinforced what parents already knew about the curriculum and that learning tags helped parents make connections to the curriculum as well as understand the curriculum’s expectations. However, one parent commented that more frequent postings would increase his/her understanding of the kindergarten curriculum.
Results also revealed that Storypark had a “somewhat positive” impact on approximately 55% of parents’ level of involvement in their child’s learning at home. More specifically, findings showed that Storypark provided parents with a means to start a conversation with their child about his/her learning at school and helped their child to expand upon conversations he/she had about his/her learning. However, one parent commented that more frequent postings would increase his/her level involvement in his/her child’s learning at home.

Findings also showed that Storypark had a “positive” or “somewhat positive” impact on approximately 70% of parents’ relationships to their child’s educators. However, results also revealed that some parents already had positive relationships to their child’s educators prior to the introduction of Storypark.

Results also revealed that Storypark had either a “positive” or “somewhat positive” impact on approximately 70% of parents’ level of communication with their child’s educators. However, findings also showed that some parents already had regular opportunities to talk to their child’s educators at drop off and pick up. Moreover, one parent commented that more frequent postings would increase his/her level of communication with his/her child’s educators.

Finally, findings showed that 75% of parents said Storypark had a “positive” or “somewhat positive” impact upon their child. However, results also revealed that some parents did not know whether their child was aware of Storypark. Moreover, other findings showed that some parents did not use Storypark with their child.
**Satisfaction.**

Results from the parent survey showed that the majority of parents were satisfied with their child’s educators’ use of Storypark as 75% said they were either “very satisfied” or “somewhat satisfied.” However, parents’ responses were both positive and negative with respect to how often educators posted learning stories. Furthermore, at least one parent felt that his/her child’s educators’ learning stories were “not very personal.”

**Post-Interviews**

Post-interviews were used to further understand the impact of a PDT (i.e., Storypark) on the home-school connection. Questions for the post-interviews with kindergarten educators and parents were based on the responses educators and parents gave in the educator and parent survey. Questions for the post-interviews with students were based on the responses educators and parents gave in their post-interviews. Since post-interview findings were similar across sites, they are only reported overall and not by site. As such, the following sections describe the overall qualitative findings of the post-interviews with kindergarten educators, parents and students.

**Educators (post-interviews).**

Nineteen semi-structured post-interviews were conducted with kindergarten educators a few weeks prior to the end of the 2017 school year. (See Appendix F for educator post-interview questions). After transcribing the interviews, I used NVivo qualitative analysis software to analyze central themes with respect the impact of Storypark on the home-school connection. Through this analysis, I identified four main
themes including: 1) Communication, 2) Understanding, 3) Trust/anxiety and 4) Parent involvement.

**Communication.**

In conducting post-interviews with educators about the impact of Storypark on the home-school connection, educators said that Storypark increased educator-parent communication. As one educator described it, “I think there’s a lot more ongoing communication [between educators and parents] just because you are always posting.” Another educator said Storypark particularly increased communication with parents of students who were in before and aftercare as she said, “Sometimes I drop the kids off at [aftercare] and I don’t even see the parents, so at least this way…[parents] see what their children are doing through the day. You can have that conversation with them.”

Another educator made a similar comment when he was asked how Storypark impacted him and his teaching practice as he said, “I was really relying on seeing parents and talking to them personally before and after school. But there’s a lot of kids that are in daycare that I really don’t see their parents much, so I think especially them, but generally, everybody loved having that kind of ongoing communication.”

Only one educator said Storypark decreased her level of communication with her students’ parents. She attributed this decrease to the fact that she found another PDT (that she had been using prior to Storypark) easier to use, and as such used Storypark less. However, educators from the same site (who had also been using the same other PDT) said that Storypark neither increased nor decreased their levels of communication with parents.
In addition to increasing educator-parent communication, educators said Storypark improved their communication with their students’ parents. Educators who had been using more traditional strategies to communicate, such as paper notices and face-to-face communication, said Storypark improved their communication because it was more “immediate” and “ongoing.” Moreover, educators who had been primarily using email said that Storypark was “better” because it was more “spontaneous.”

Educators who had been using social media to communicate with their students’ parents also said Storypark improved their communication because they said it was more “private.” As one educator described it, “With Twitter you can’t put [students’] faces on it…[And parents] might not want to communicate on Twitter because there’s so many people on it, but with Storypark they’re only communicating with us.”

Finally, educators who had been using other PDT to communicate with their students’ parents said Storypark improved educator-parent communication because it allowed for more “two-way communication.” As such, one educator said, “I found with Storypark the difference was that [parents could] comment more, whereas in [the other PDT] they didn’t have to leave a comment….So I find Storypark gets [parents] more engaged.”

**Understanding.**

In addition to increased and improved educator-parent communication, educators said Storypark increased parents’ understanding of their child’s classroom learning. As one educator described it, Storypark provides a “window into the child’s day.” Using similar language, another educator said Storypark made her classroom “more transparent as far as what [her students] were doing.”
With increased transparency, educators said that parents “had less confusion or questions about what was happening or what the curriculum looked like.” For example, one educator said that after he began using Storypark he had “less parents than usual requesting [parent-teacher] interviews because they already seemed to have ongoing insight into what was happening in class.”

Educators also said that Storypark provided parents with a better understanding of play-based learning. When one educator was asked about the impact of Storypark on her level of communication with her students’ parents, she said,

I think that parents have a real comfort knowing what they’re children are doing. I mean, it’s been the age-old quandary of, “What does my child do at school all day?” Especially in kindergarten where they just play. So I think [Storypark] has taken away a lot of that…When we put posts up and we tag, [parents] can see exactly what the explanations are for that activity and how it is an educational program. It’s not…it’s a play-based program, but they’re learning through play.

**Trust/anxiety.**

With an increased understanding of classroom and play-based learning, educators said parents’ levels of trust in them also increased. For example, when one educator was asked how Storypark impacted her relationships to her students’ parents, she shared an anecdote about a parent who had been putting pressure on her to communicate more about her daughter’s learning. The educator said that as soon as she started using Storypark, the parent “backed right off and was very thankful.” The educator went on to say that Storypark “really helped the relationship” because there was “more trust, that there was actually learning happening in kindergarten.”
Similarly, another educator noticed that after she introduced Storypark into her classroom, her students’ parents were “more willing to share the stories that happened at home.” The educator went on to say that she especially noticed an increase in sharing from parents who did not have regular opportunities to interact with her at drop off or pick up.

In addition to increased levels of trust, Storypark decreased parents’ levels of anxiety. As one educator described it, “I find that the more open you are, the more [parents] tend to relax. That’s what Storypark [does].” Another educator, who took over for a teacher on maternity leave midway through the year, made a similar comment as she said Storypark “helped parents adjust to the new teacher coming in. It eased [parents’] minds that they could see that their kids were happy during the day.”

Finally, when another educator was asked what she liked most about Storypark she said, “Sharing what is normally private to the child within the school environment with the family [as parents] really long for a glimpse of what their child does when they’re not around and it’s really settling for them, especially with a first experience at school, to see their child in action.”

*Parent involvement.*

In addition to increased levels of trust and decreased levels of anxiety, educators said Storypark increased parents’ levels of involvement in the Kindergarten Program. When one educator was asked about the impact that Storypark had upon her students’ parents she said, Storypark “gets parents more involved [because] children are more involved. When children see that their work is appreciated, that their parents can see their work…they’re eager to do more and they’re proud of what they’re doing.”
Similarly, another educator said Storypark “brought parents into the [Kindergarten] Program because it helped families’ conversations over the dinner table. When kids go home and say that they did nothing…Storypark sparks a conversation.”

In addition to increased levels of involvement in the Kindergarten Program, educators said that Storypark increased the connections parents made between their child’s classroom learning and the learning they did at home. When one educator was asked how Storypark impacted parents’ levels of involvement in their children’s learning she said, “Parents are making connections more, connecting what the children do at school to what they do at home.”

Despite these connections, another educator said she did not know whether parents were able to “extend” their children’s learning at home as she said parents were doing “stuff that [the educator] was already doing.” Another educator made a similar comment when she was asked how Storypark impacted her level of communication with her students’ parents as she said, “I don’t think parents, as of yet, really understand what Storypark can do for them in terms of taking ownership [of their children’s learning] and continuing on with it.”

Still, another educator said that reading the comments parents posted about her learning stories allowed her to see what her students had learned in the classroom as she said, “It’s great to see that [students] remembered or that they enjoyed an activity and they’re still trying it out at home or they’re practicing it again…It’s nice to see the continuity.”
Parents (post-interviews).

Sixteen semi-structured post-interviews were conducted with parents a few weeks prior to the end of the 2017 school year. (See Appendix G for parent post-interview questions). NVivo qualitative analysis software was used to analyze transcripts of these interviews. The following main themes were identified with respect the impact of Storypark on the home-school connection: 1) Understanding, 2) Parent-child conversations, 3) One-way vs. two-way communication, 4) Parent involvement and 5) Limitations/improvements.

Understanding.

Like the results of the educator post-interviews, findings from the parent post-interviews showed that Storypark increased parents’ understanding of their children’s classroom learning. When parents were asked what they liked most about Storypark, nearly all replied, “being able to see what [was] happening in the classroom.” As one parent described it, “As a parent you’re kind of craving any information you can get…so it’s nice to get notifications every once in a while and see [your child] in a picture because we don’t know what’s happening in their day, so it’s a little window into [their] world.”

Another parent described Storypark as having a “snap shot” of what her child was learning about. The parent went on to say that she found “the teacher’s caption” explaining what her child was doing in each picture to be particularly helpful. Similarly, another parent said she liked Storypark because it allowed her to be “a fly on the wall” in the classroom, “connect to [her child] when he was not around” and get “insight into his day.”
In addition to increasing parents’ understanding of their children’s classroom learning, several parents said Storypark increased their understanding of play-based learning/ Ontario’s kindergarten curriculum. As one parent described it, “I saw [my daughter] doing a lot of play, but because of the [learning] tags at the bottom, I could tell the purpose behind it…So I would definitely say Storypark improved my understanding [of the curriculum], because I didn’t know much about it before.” Similarly, another parent said, “Storypark started to make me familiar with some of the language [of the curriculum] and key tags…The tags were very helpful. [They] brought awareness to the picture about the learning.” Finally, another parent said,

You know, the notion of play-based learning is abstract for me as a parent. I don’t know what that means. So in my mind, they’re just playing. Just basically running around all day playing. So it’s helpful for me to see the structured elements of play.

**Parent-child conversations.**

In addition to increasing parents’ understanding of classroom and play-based learning, many parents said Storypark helped them to engage in “better” conversations with their children about their learning. When one parent was asked if Storypark was a useful tool for her as a parent, she said, “Yes for sure. It was helpful for me to…I could say to Wendy, ‘Oh, I saw you do this today’ and it would start a better conversation than ‘What did you do today?’ and getting, ‘Nothing.’” Another parent had a similar comment when she was asked how Storypark impacted her level of participation in her child’s learning as she said,

It gave us a springboard, allowed us to have a better conversation about what was happening
at school. Because I think it’s hard for a little one to say, ‘Oh this is what I did.’ If I ask, ‘What did you do at school?’ It may be harder for him, where as now I can say, ‘Oh I saw the story about the letter…Tell me more about that.’ So like, it gave me a better question to ask my child about how his day was or what he did at school.

In addition to improving the conversations parents had with their children about their learning, several parents said their children enjoyed having them know more about their school day. As one parent described it, “Having a mom who understands what [her child] is doing during a given day, knowing that his parent is involved and engaged is helpful to him.” Similarly, when another parent was asked how Storypark impacted her child, she said, “My daughter likes us to know what’s happening. She likes to have our involvement. She’s still young enough that she really likes that.”

However, while some parents were able to see the positive impact that Storypark had on their child, other parents were unsure of its effects. For example, when one parent was asked how Storypark impacted his child he said, “I don’t think Storypark impacted him directly because he didn’t really have a lot of direct interaction with…it [was] more of just a conversation starter.”

*One-way vs. two-way communication.*

In addition to improving conversations that parents had with their children about their learning, Storypark also improved communication between parents and their children’s educators. When one parent was asked how Storypark impacted his level of communication with his child’s educator, he said, “Well, it increased how much we received and how quickly we received it, so that was an improvement.” Another parent,
in response to the same question simply said, “Storypark was better. It gave us a visual, rather than just reading an email.”

However, when another parent was asked the same question, she said that while she enjoyed receiving learning stories from her child’s educator, he never responded to the comments she or her son made, and as such she said, “Communication was very one-way.” Similarly, another parent said,

> At the beginning I’d ask some questions of the teachers, like, in terms of education style, in terms of reading and sight words versus phonics and so forth but…the response wasn’t really what I was expecting so I figured Storypark wasn’t an avenue where they were interacting with parents on a level where they’re looking for input or even that sort of interaction. I think it’s more of a display. This is what your child is doing… It was one-way communication.

Furthermore, when another parent was asked what she liked least about Storypark she said, “It’s not clear whether anyone’s interested if I did post something…We’ve never been invited to share a story from home intentionally.”

**Parent involvement.**

Despite the aforementioned limitations in communication, many parents said Storypark increased their levels of involvement in their children’s learning at home. When one parent was asked how Storypark impacted her involvement in her daughter’s learning, she said, “Storypark helped because I got to see what they [were] working on at school [and then] help encourage that a little bit further at home.” Another parent, in response to the same question, had a similar response as she said, “You can see an activity they’re doing [at school] and try and reinforce it at home.” As such, the parent
said that reading her daughter’s educator’s learning stories helped her to “identify areas
that needed to be worked on at home.”

However, other parents said that Storypark had a limited impact on their levels of
involvement in their children’s learning at home. This was for two primary reasons.
First, parents said they were already “pretty hands-on and involved.” Second, parents
said educators’ learning stories were too infrequent to have a significant impact on them.
As one parent described it, “Because Storypark was so infrequent, I didn’t really rely on
it as a regular material that I would use to expand on.”

**Limitations/Improvements.**

When parents were asked whether or not Storypark was a useful tool for them
and/or their child’s educators, the majority said, “Yes.” However, many parents also
recognized the limitations of using Storypark within the context of Ontario’s kindergarten
program. For example, when one parent was asked whether Storypark was a useful tool
for his child’s educators, he said, “I feel like the platform was built for very
individualized stories and with the conditions in my son’s class, where there is one
teacher and one ECE and over thirty-one or thirty-two students, their ability to use it in a
very individualized way is lacking.” The parent went on to say, “Where the app could be
most powerful would be in one-on-one engagement [but] the classroom doesn’t allow for
that.”

Furthermore, when another parent was asked whether Storypark was a useful tool
for him as a parent, he said, “Not yet.” The parent went on to give the following critique
of one of his son’s educators’ learning stories:
I’m looking right now at a photograph [of my son] looking at a placemat with a lot of different numbers written on it and I can see that a teacher’s reaching into a jar of dice, [but] it doesn’t tell me… the photo…they didn’t tell us what was going on. They just said, ‘Fun with Math.’ So I have to interpret what he’s actually doing….Right now the photos are accompanied by a minimal amount of descriptive information and not enough information on what’s going on or what’s happening.

In addition to seeking more substantive learning stories, many parents said that educators could improve their use of Storypark by posting more learning stories on a more consistent basis. For example, when one parent was asked what would make Storypark better, she said, “Nothing about Storypark itself. I would just say the frequency of posts. And they were sort of sporadic. So when we got them it was awesome, but we didn’t know when they were coming.”

Finally, in response to the same question, another parent said having “a little more instruction on how to use Storypark” would be helpful as she said,

A lot of parents that I spoke to were scared to use Storypark because they didn’t want to overwork the teacher, they didn’t know what they should be putting on there…I didn’t end up using it at all and it would have been nice to, but then you don’t know what kind of stuff to put on there, how often. Are you creating more work for the teacher, taking them away from their regular teaching? Because it’s such a new thing and so I know those are concerns among parents. You don’t want to be the parent that is over-burdening your child’s teacher.

**Students (post-interviews).**

Thirty-three semi-structured post-interviews were conducted with four and five-year-old kindergarten students (i.e., three students per classroom) a month prior to the
end of the 2017 school year. (See Appendix H for student post-interview questions). NVivo qualitative analysis software was used to analyze the transcripts of these interviews. In doing so, I identified four main themes with respect to the impact of Storypark on students including: 1) Awareness, 2) Remembering, 3) Parent-child conversations and 4) Pride.

**Awareness.**

When students were asked, “What is Storypark?”, nearly half of the participants (i.e., 15) provided a correct answer. For example, when one student was asked what Storypark was, he said, “It’s something that the teachers put pictures on so our parents can see it.” Another child simply described Storypark this way: “It’s what tells your parents what you did at school.” When students were asked how they knew about Storypark, most said either their parents or their teachers had shown it to them. For example, when one child was asked how he knew about Storypark, he said, “Our teacher taught us.” Another child, in response to the same question said, “Because my mommy shows me everyday.”

However, not all students were familiar with Storypark. In response to the question, “What is Storypark?”, several students said they did not know or else provided an incorrect answer such as, “That means there is a story at a park and you can read it and you can play at the park.”

Still, more than half of the students at Site A, five out of six students at Site D, two out of six students at Site B and one out of six students at Site C not only were aware that Storypark was being used in their classrooms but also were able to explain the
purpose of Storypark. (See Table 18 below for summary of students’ awareness of Storypark).

Table 18

*Summary of Students’ Awareness of Storypark*

<table>
<thead>
<tr>
<th>Site</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was aware that SP was being used / knew what SP was used for</td>
<td>8 yes 7 no</td>
<td>2 yes 4 no</td>
<td>1 yes 5 no</td>
<td>5 yes 1 no</td>
</tr>
</tbody>
</table>

**Remembering.**

In asking students how Storypark helped them, many said that it helped them to remember what they learned about at school. Furthermore, when I looked at the learning stories with students, most were able to recall specific details about learning activities and/or experiences that were not explicitly mentioned and/or depicted in their educators’ learning stories. For example, when I asked one child to tell me about a descriptive learning story titled, ‘Creating a Bee Picture Using Loose Parts,’ the child said, “I’m making a beehive and those are the eggs and that’s all the honey, like the nectar.” The child went on to say that his teacher had read the class a story about bees called, ‘The Bee.’”

In addition to being able to recall specific details about particular learning activities and/or experiences, several students explicitly told me that Storypark helped them to remember their learning. For example, when one child was asked how Storypark helped him, he said, “It makes you remember what you did.” Similarly, when another student was asked if she liked when her teacher used Storypark to take pictures of her
learning, she said, “Yes. Because when I’m bigger my mom and dad can find those stuff and I could see them so that’s how we’ll remember what I did.”

**Parent-child conversations.**

In addition to helping students remember their learning, several students said Storypark helped their parents to “know what [they] did at school.” For example, when one student was asked how Storypark helped her parents, she said, “It shows my parents what I’ve been doing at school so I don’t have to tell them so much about my day.” The child went on to say, “I usually tell [my parents] everyday what I’m doing and I get tired of doing that.” Another child, in response to the same question said, “Because it helps my dad look at what I made and what I did with my friends.” Other children said Storypark helped their parents because it made them “happy.” As one student described it, “It helps my mom and dad to be happy and it makes me learn stuff.”

However, not all children were aware that their educators were using Storypark to share pictures of their learning with their parents. When some children were asked if their parents had ever shown them Storypark, they said they had not. Moreover, a few children did not like having their parents see pictures of their learning at school. When one child was asked why she did not like having her parents know what she did at school she said, “Because I don’t want them to say, ‘Yeah, yeah, yeah!’” Still, the vast majority of students said that they not only liked having their educators take pictures of them at school but also liked having their parents see those pictures.

**Pride.**

Finally, several students said Storypark made them feel proud as it helped them to share their work with their educators and parents. When one child was asked why he
liked Storypark, he simply said, “Proud.” When another child was asked the same question, he said, “Because it makes me feel good.”

Other children expressed their pride more implicitly. For example, when one child was asked why he liked Storypark he said, “[My parents] get to see the pictures that I did at school and all the buildings that I did at school too.” Similarly, when another child was asked the same question, he said, “It shows me something that I built that looks really awesome.”

**Summary (post-interviews)**

**Educators.**

Post-interviews with educators revealed that Storypark both increased and improved communication between educators and parents, irrespective of the communication strategy that educators used prior to the introduction of Storypark into their classrooms. However, one educator said that Storypark decreased her level of communication with her students’ parents as she found another PDT (that she had used prior to Storypark) easier to use. Still, other educators from the same site (who had also used another PDT prior to Storypark) said that they preferred Storypark because it allowed for more “two-way communication” with parents.

Findings also showed that Storypark increased parents’ understanding of their children’s classroom learning as it made their classrooms more “transparent.” With this increased transparency, educators said parents were “less confused” about what their children were learning about in the classroom. Furthermore, educators said Storypark helped parents to better understand the kindergarten curriculum or the purpose behind
play-based learning, as educators were able to tag pictures of their students’ learning with the curriculum’s expectations.

Results also revealed that Storypark increased parents’ levels of trust in their children’s educators as they had a better understanding of what their children were learning about in the classroom. With this increase in trust, educators said that Storypark decreased parents’ levels of anxiety as they had more confidence that their children were “happy during the day” and “learning in kindergarten.”

Finally, findings showed that Storypark increased parents’ levels of involvement in the Kindergarten Program, as they were able to see what was happening in the classroom and have conversations with their children about the learning they did at school. Moreover, educators said that Storypark increased the connection between home and school, as parents were able to “make connections” between the learning their children did at school and the learning they did at home.

However, despite these connections, educators said that parents were not necessarily able to “extend” their children’s learning as they primarily replicated the learning their children did in school at home, rather than expand upon it. Still, educators said that Storypark allowed them to see the “continuity” from what their students learned at school to what they practiced at home.

Parents.

Results from the parent post-interviews showed that Storypark increased parents’ understanding of their children’s classroom learning as Storypark allowed them to be a “fly on the wall” in the classroom, provided them with a “window” into their children’s “world” and gave them “insight” into their children’s day. Additionally, many parents
said Storypark increased their understanding of Ontario’s kindergarten curriculum and/or the purpose behind play-based learning, as learning tags made parents “more familiar with the language” of the curriculum and “brought awareness” to the learning that was depicted in educator learning stories.

Findings also revealed that Storypark improved parent-child conversations as educator learning stories provided parents with a “springboard” to have a “better conversation” with their children about their learning. Moreover, several parents said their children found it “helpful” and “liked” having their parents know more about the learning they did at school. However, some parent doubted that Storypark had any “direct” effect on their children, as they did not have “a lot of direct interaction” with the platform.

Results also revealed that Storypark improved communication between parents and educators as parents received more information about their children’s classroom learning more immediately. Moreover, several parents enjoyed the “visual” information that Storypark provided. However, some parents said their children’s educators used Storypark more for one-way communication, than for two-way communication.

Findings also showed that Storypark increased parents’ level of involvement in their children’s learning as parents said reading their children’s educators’ learning stories allowed them to “reinforce” the learning activities they did at school at the home. However, some parents said Storypark did not impact their level of involvement in their children’s learning because they were already involved. Moreover, other parents said Storypark did not impact their level of involvement because their children’s educators’ learning stories were too infrequent, inconsistent and/or vague to expand upon.
Finally, while the majority of parents found Storypark useful, they also recognized the limitations of using Storypark within the context of Ontario’s Kindergarten Program. As such, parents said educators could improve their use of Storypark if they used the tool more for one-on-one engagement, posted more learning stories, posted learning stories more consistently, provided more substantive information in their learning stories and provided more instruction with respect to how parents should use Storypark.

**Students.**

Results from the post-interviews with students showed that nearly half of the students who were interviewed not only were aware that Storypark was being used by their educators and/or their parents but also were cognizant of what Storypark was being used for. However, several students did not know what Storypark was nor did they know that Storypark was being used in their classrooms and/or at home. Students from Site D had the most awareness, as five out of six students were aware of Storypark. Students from Site C had the least awareness, as one out of six students were aware of Storypark.

Findings also revealed that Storypark helped students to remember their learning as most were able to recall specific details about learning activities they had done in the past when they were shown their educators’ learning stories about these activities. Results also showed that Storypark helped students to have conversations with their parents about what they did at school. Finally, the majority of students said they liked having their educators share pictures of their learning because it made their parents feel “happy” and made them feel “proud.”
CWA Interviews

I conducted cognitive work analysis interviews with 19 educators, 16 parents and three principals simultaneous to and/or after the introduction of Storypark into the work domain (i.e., 11 kindergarten classrooms at four schools in a large, urban school district in Ontario). (See Appendix I for educator CWA interview and Appendix J for parent CWA interview). These interviews were used to determine the extent to which the work domain supported the use of PDT and, in turn, the home-school connection. This was done by identifying the various Human-tech factors that either constrained or afforded educators’ and parents’ abilities to do their work (i.e., support their students/children’s learning) in the work domain (Vicente, 2003). The qualitative results of the CWA interviews are reported first, followed by the quantitative findings. I did not include data from the CWA interviews with principals for the reason specified in the previous chapter.

CWA interviews (qualitative).

NVivo qualitative analysis software was used to conduct a qualitative analysis of educator and parent responses to the CWA interview questions. Each response was first coded according to Human-tech category (i.e., physical, psychological, team, organizational and political) and then classified as either a constraint or an affordance. Factors were coded as constraints if they restricted PDT use and/or the home-school connection and were coded as affordances if they facilitated PDT use and/or the home-school connection. The following sections report the most relevant and/or frequently cited constraints and affordances with respect to the use of PDT and/or the home-school connection at each site. As such, the Human-tech ladders that are detailed below are abbreviated versions of the complete Human-tech ladders that were used in the
quantitative analysis. (See the next section for details related to the complete versions of the Human-tech ladders).

*Site A.*

The following table (Table 19) presents the most relevant constraints and affordances with respect to PDT use and/or the home-school connection found in each Human-tech category at Site A.

Table 19

*Summary of Human-tech Constraints and Affordances at Site A*

<table>
<thead>
<tr>
<th>Human-tech category:</th>
<th>Constraints: (-)</th>
<th>Affordances: (+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Educator responses: Educators had to share one document camera and one smart board with six kindergarten classrooms and four grade one classrooms. Educators had to share the “iPad” cart with the rest of the school. The Wi-Fi connection in the building was slow. Parent responses: Parents did not cite any relevant constraints with respect to the physical environment and/or available technology</td>
<td>Educator responses: Educators had access to one document camera, one smart board as well as an “iPad cart.” Each kindergarten classroom had one tablet computer. Parent responses: Parents had a variety of technologies that supported the use of PDT. Parents had access to the Internet.</td>
</tr>
<tr>
<td>Psychological</td>
<td>Educator responses: Some educators were very uncomfortable using technology or learning a new technology. Some educators expressed concerns with respect to the impact of technology on their students.</td>
<td>Educator responses: Some educators were very comfortable using technology and learning how to use a new technology.</td>
</tr>
<tr>
<td>Team</td>
<td>Parent responses:</td>
<td>Parent responses:</td>
</tr>
<tr>
<td>------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td></td>
<td>Some parents expressed concerns with respect to the impact of technology on their children.</td>
<td>Most parents were very comfortable using technology and learning how to use a new technology.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team</th>
<th>Educator responses:</th>
<th>Educator responses:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Some educators required a formal training to learn how to use a new technology.</td>
<td>Educators’ main teaching tasks were aligned with the central functions of PDT. Educators used a combination of traditional strategies to communicate with their students’ parents (i.e., face-to-face and paper-based) as well as tech-based strategies (email and social media). Some educators’ main strategies to learn a new technology were to “play around with it,” use “trial and error” and collaborate with other colleagues. Some educators used apps with their students.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team</th>
<th>Parent responses:</th>
<th>Parent responses:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parents did not receive ongoing communication from their children’s educators about the daily learning activities of the classroom, the technology that was available to their children and/or their children’s academic/social progress. Parents relied on traditional strategies to learn what and how their children were doing in school (i.e., face-to-face,</td>
<td>Parents’ main strategy for supporting their children’s learning at school was to communicate with their children’s educators. Parents attempted to extend and/or reinforce learning from school at home. Parents used a variety of different apps for work and home.</td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>Educator responses:</td>
<td>Parent responses:</td>
<td>Educator and parent responses:</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Organizational</strong></td>
<td>The school had a small budget for technology.</td>
<td>Some parents’ work schedules did not allow them to have regular, face-to-face communication with their children’s educators at drop off and pick up.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Educator responses:</strong></td>
<td><strong>Parent responses:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Educator responses:</strong></td>
<td>The school administration was open to/supportive of educators’ use of technology. The school administration asked for input from educators before making decisions with respect to technology and the Kindergarten Program. The Kindergarten Chair acted as a liaison between the kindergarten team and the principal.</td>
<td>The parent council was active at the school. Some parents’ work schedules allowed them to have regular, face-to-face communication with their children’s educators at drop off and pick up.</td>
<td></td>
</tr>
<tr>
<td><strong>Political</strong></td>
<td>The school board’s policies with respect to student privacy restricted what information educators could share with their students’ parents. The school board lacked a clear policy with respect to educators’ use of their personal devices. The school board had to approve educators’ use of specific technologies before they could use them. The school board did not provide</td>
<td></td>
<td>Ontario’s Ministry of Education’s new report card was aligned with the new kindergarten curriculum as well as the use of PDT.</td>
</tr>
<tr>
<td></td>
<td><strong>Educator responses:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Parent responses:</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

parent-teacher interviews, report cards and asking their children).
adequate training on the new curriculum or report card. The school board did not provide ECEs with prep time. The Ontario Ministry of Education’s policy with respect to class size restricted educators’ abilities to document their students’ learning (i.e., too many students per class).

Parent responses:

The school board’s policy with respect to police clearances restricted parents’ ability to volunteer in their children’s classrooms.

Site B.

The following table (Table 20) presents the most relevant constraints and affordances with respect to PDT use and/or the home-school connection found in each Human-tech category at Site B.

Table 20

Summary of Human-tech Constraints and Affordances at Site B

<table>
<thead>
<tr>
<th>Human-tech category</th>
<th>Constraints: (-)</th>
<th>Affordances: (+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Educator responses:</td>
<td>Educator responses:</td>
</tr>
<tr>
<td></td>
<td>The Wi-Fi connection in the building was slow. It also had a limited number of drops to connect computers to the Internet.</td>
<td>Educators had access to one document camera. Educators had two tablet computers per classroom.</td>
</tr>
<tr>
<td></td>
<td>Parent responses:</td>
<td>Parent responses:</td>
</tr>
<tr>
<td></td>
<td>Parents did not cite any relevant constraints with</td>
<td>Parents had a variety of technologies that supported</td>
</tr>
<tr>
<td>Psychological</td>
<td>Educator responses:</td>
<td>Educator responses:</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Educators were not very comfortable using technology or learning how to use a new technology. Some educators became overwhelmed and/or frustrated when learning how to use a new technology.</td>
<td>Some educators were “not shy” to try to learn how to use a new technology. Educators valued the purpose behind PDT.</td>
<td></td>
</tr>
<tr>
<td>Parent responses:</td>
<td>Parent responses:</td>
<td></td>
</tr>
<tr>
<td>Parents did not cite any relevant constraints with respect to the thoughts, feelings and/or beliefs they had about themselves, technology and/or the ability to use technology.</td>
<td>Parents were very comfortable using technology and learning how to use a new technology.</td>
<td></td>
</tr>
<tr>
<td>Team</td>
<td>Educator responses:</td>
<td>Educator responses:</td>
</tr>
<tr>
<td>Educators primarily relied on traditional strategies to communicate with their students’ parents (i.e., face-to-face and paper notices). Some educators did not collaborate with each other to learn how to use a new technology. Educators required more formal training to learn how to use a new technology.</td>
<td>Educators’ main teaching tasks were aligned with the central functions of PDT. Some educators used email to communicate with their students’ parents.</td>
<td></td>
</tr>
</tbody>
</table>

the use of PDT. Parents had access to the Internet.
### Parent responses:

Parents did not receive ongoing communication from their children’s educators about the daily learning activities of the classroom, the technology that was available to their children and/or their children’s academic/social progress. Parents relied on traditional strategies to learn what and how their children were doing in school (i.e., face-to-face, parent-teacher interviews, report cards and asking their children).

### Parent responses:

Parents’ main strategy for supporting their children’s learning at school was to communicate with their children’s educators. Parents attempted to extend and/or reinforce learning from school at home. Parents used a variety of different apps for work and home.

### Organizational Educator responses:

The school administration took a “top down” approach to decision making as they made decisions without a lot of planning or input from educators. The school administration required certain notices of communication from educators to parents to be “vetted” before they were sent out. The school administration did not value or understand the purpose behind Ontario’s new kindergarten curriculum (i.e., play-based learning). The school had a small budget for technology. The school administration had to put technology on school-owned devices before

### Educator responses:

The school administration stepped in to support educators in the classroom when they needed it. The school administration encouraged educators to purchase the resources that they needed.
<table>
<thead>
<tr>
<th>Political</th>
<th>Educator responses:</th>
<th>Parent responses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The school board’s policies with respect to student privacy restricted what information educators could share with their students’ parents. The school board lacked a clear policy with respect to educators’ use of their personal devices. The school board had to approve educators’ use of specific technologies before they could use them. The school board did not provide adequate training on the new curriculum or report card. The school board did not provide ECEs with prep time. The Ontario Ministry of Education’s policy with respect to class size restricted educators’ abilities to document their students’ learning (i.e., too many students per classroom).</td>
<td>The school board’s policy</td>
<td>The Ontario Ministry of Education’s new report card was aligned with the new Kindergarten Curriculum as well as the use of PDT.</td>
</tr>
</tbody>
</table>

Parent responses:

The school sent out notifications through email and had a blog. The parent council was active at the school. Some parents’ work schedules allowed them to have regular, face-to-face communication with their children’s educators at drop-off and pick-up. |
with respect to police clearances restricted parents’ abilities to volunteer in their children’s classrooms.

**Site C.**

The following table (Table 21) presents the most relevant constraints and affordances with respect to PDT use and/or the home-school connection found in each Human-tech category at Site C.

Table 21

*Summary of Human-tech Constraints and Affordances at Site C*

<table>
<thead>
<tr>
<th>Human-tech category:</th>
<th>Constraints: (-)</th>
<th>Affordances: (+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Education responses:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Wi-Fi connection in the building was patchy. The size and layout of the classrooms did not work well for inquiry-based learning.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parent responses:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some kindergarten classrooms were too small for the amount of students assigned to the room.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Educator responses:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Each kindergarten classroom had one tablet computer. Most kindergarten classrooms had a Smart Board.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parent responses:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parents had a variety of technologies that supported the use of PDT. Parents had access to the Internet.</td>
<td></td>
</tr>
<tr>
<td>Psychological</td>
<td>Education responses:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some educators were not very comfortable using technology or learning how to use a new technology.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parent responses:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some educators were educators open to learning how to use a new technology. Some educators were very comfortable using technology and learning how to use a new technology.</td>
<td></td>
</tr>
</tbody>
</table>

159
Parents did not cite any relevant constraints with respect to the thoughts, feelings and/or beliefs they had about themselves, technology and/or their ability to use technology.

Parents were very comfortable with technology and with learning how to use a new technology.

<table>
<thead>
<tr>
<th>Team</th>
<th>Educator responses:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Some educators primarily relied on traditional strategies to communicate with their students’ parents (i.e., face-to-face and paper notices). Some educators required more formal training to learn how to use a new technology.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team</th>
<th>Educator responses:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Educators’ main teaching tasks were aligned with the central functions of PDT. Some educators used PDT to share their students’ learning with parents. Some educators’ strategies for learning how to use a new technology were to “play around,” use “trial and error” and collaborate with other colleagues. Some educators used apps with their students.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team</th>
<th>Parent responses:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Most parents did not receive ongoing communication from their children’s educators about the daily learning activities of the classroom, the technology that was available to their children and/or their children’s academic/social progress. Most parents relied on traditional strategies to learn what and how their children were doing in school (i.e., face-to-face, parent-teacher interviews, report cards and asking their children).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team</th>
<th>Parent responses:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parents’ main strategy for supporting their children’s learning at school was to communicate with their children’s educators. Parents attempted to extend and/or reinforce learning from school at home. Parents used a variety of different apps for work and home.</td>
</tr>
<tr>
<td>Organizational</td>
<td>Educator responses:</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------------</td>
</tr>
<tr>
<td></td>
<td>The school had a small budget for technology. The school administration had to put technology on school-owned devices before educators could use it.</td>
</tr>
<tr>
<td>Parent responses:</td>
<td>Most communication from the school was paper-based. Some parents’ work schedules did not allow them to have regular, face-to-face communication with their children’s educators at drop-off and pick-up.</td>
</tr>
<tr>
<td>Political</td>
<td>Educator responses:</td>
</tr>
<tr>
<td></td>
<td>The school board lacked a clear policy with respect to educators’ use of their personal devices. The school board had to approve educators’ use of specific technologies before they could use them. The school board did not provide adequate training on the new curriculum or report card. The school board did</td>
</tr>
<tr>
<td></td>
<td>Educator responses:</td>
</tr>
<tr>
<td></td>
<td>The school administration was open/supportive of educators using the technology they wanted to use. The school administration was “trusting” of the educators. Educators depended on the school administration for support. The school administration asked educators for input before making decisions. An informal leader on the kindergarten team acted as a liaison between the kindergarten team and the principal.</td>
</tr>
<tr>
<td></td>
<td>Parent responses:</td>
</tr>
<tr>
<td></td>
<td>The school had an active parent council. Some parents’ work schedules allowed them to have regular, face-to-face communication with their children’s educators at drop-off and pick-up.</td>
</tr>
<tr>
<td></td>
<td>Educator responses:</td>
</tr>
<tr>
<td></td>
<td>The Ontario Ministry of Education’s new report card was aligned with the new kindergarten curriculum as well as the use of PDT.</td>
</tr>
</tbody>
</table>
not provide ECEs with prep time. The Ontario Ministry of Education’s policy with respect to class size restricted educators’ abilities to document their students’ learning (i.e., too many students per classroom).

Parent responses:

The school board’s policy with respect to police clearances restricted parents’ abilities to volunteer in their children’s classrooms. Ontario M of E’s policy with respect to class size limited student learning (i.e., too many students per classroom).

Parent responses:

Parents did not cite any relevant affordances with respect to the regulations and policies at the provincial or school board that impacted them and/or their children.

Site D.

The following table (Table 22) presents the most relevant constraints and affordances with respect to PDT use and/or the home-school connection found in each Human-tech category at Site D.

Table 22

Summary of Human-tech Constraints and Affordances at Site D

<table>
<thead>
<tr>
<th>Human-tech category:</th>
<th>Constraints: (-)</th>
<th>Affordances: (+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Educator responses:</td>
<td>Educator responses:</td>
</tr>
<tr>
<td></td>
<td>The Wi-Fi connection in the building was slow. The building had a limited amount of drops to connect computers to the Internet. Educators had to share 10 tablet computers (for students) with the rest of the</td>
<td>Each kindergarten classroom had one tablet computer. All kindergarten classrooms had a Smart Board. Educators had access to a set of chrome books. Educators had regular access to 10 tablet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>School</th>
<th>Parent responses: Parents did not cite any relevant constraints with respect to the physical environment and/or available technology.</th>
<th>Parent responses: Parents had a variety of technologies that supported the use of PDT. Parents had access to the Internet.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological</td>
<td>Educator responses: Some educators were not very comfortable using technology or learning how to use a new technology.</td>
<td>Educator responses: Some educators were very comfortable using technology and learning how to use a new technology. Some educators were eager to learn how to use PDT to document student learning more effectively.</td>
</tr>
<tr>
<td>Team</td>
<td>Educator responses: Some educators required more formal training to learn how to use a new technology.</td>
<td>Educator responses: Educators’ main teaching tasks were aligned with the central functions of PDT. Educators combined traditional strategies to communicate with their students’ parents (i.e., face-to-face and paper notices) as well as tech-based methods (i.e., email and social media). Educators also used PDT to share their students’ learning with</td>
</tr>
<tr>
<td>Parent responses:</td>
<td>Parent responses:</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>Some parents did not receive ongoing communication from their children’s educators about the daily learning activities of the classroom, the technology that was available to their children and/or their children’s academic/social progress. Some parents relied on traditional strategies to learn what and how their children were doing in school (i.e., face-to-face, parent-teacher interviews, report cards and asking their children).</td>
<td>Parents’ main strategy for supporting their children’s learning at school was to communicate with their children’s educators. Parents attempted to extend and/or reinforce learning from school at home. Parents used a variety of different apps for work and home. Parents had a Facebook page for communicating with each other. Parents volunteered to serve as class reps in each classroom.</td>
<td></td>
</tr>
<tr>
<td><strong>Organizational</strong></td>
<td><strong>Educator responses:</strong></td>
<td></td>
</tr>
<tr>
<td>The school administration had to put technology on school-owned devices before educators could use it.</td>
<td>The school administration was open/supportive of educators using the technology they wanted to use and was “trusting” of the educators. Educators depended on the school administration for support. The school administration asked educators for input before making decisions. An informal leader on the kindergarten team acted as a</td>
<td></td>
</tr>
<tr>
<td>Political</td>
<td>Educator responses:</td>
<td>Parent responses:</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>The school board’s policy with respect to student privacy restricted what information educators could share with their students’ parents. The school board had to approve educators’ use of specific technologies before they could use them. The school board did not provide adequate training on the new curriculum or report card. The school board did not provide ECEs with prep time.</td>
<td>Parent responses:</td>
<td></td>
</tr>
<tr>
<td>Some parents viewed Ontario’s Ministry of Education’s new report card was aligned with the new kindergarten curriculum as well as the use of PDT.</td>
<td>Parent responses:</td>
<td></td>
</tr>
<tr>
<td>Ontario’s Ministry of Education’s new report card was aligned with the new kindergarten curriculum as well as the use of PDT.</td>
<td>Parents did not cite any relevant affordances with</td>
<td></td>
</tr>
<tr>
<td>Education’s play-based curriculum as a constraint to their children’s learning.</td>
<td>respect to the regulations and policies at the provincial or school board that impacted them and/or their children.</td>
<td></td>
</tr>
</tbody>
</table>

**Summary (CWA qualitative).**

The qualitative analysis of the most relevant and/or frequently cited Human-tech constraints and affordances pertaining to PDT use and/or the home-school connection showed several common themes, which are detailed below.

**Physical.**

At all sites, the physical environment and/or available technology both afforded and constrained the use of PDT and, in turn, the home-school connection. More specifically, all educators had access to at least one tablet computer in their classrooms. Furthermore, educators at Sites B and D had access to considerably more technology than one tablet computer.

However, the Wi-Fi connection was either slow or patchy at all sites. As such, educators’ use of PDT was restricted by the technological infrastructure of the school building at all sites.

Despite this constraint, PDT use was supported by parents’ access to a variety of different technologies as well as their access to the Internet.

**Psychological.**

At all sites, the thoughts, feelings and/or beliefs educators had about themselves, technology and/or their ability to use technology both afforded and constrained the use of PDT and, in turn, the home-school connection. More specifically, educators’ comfort
level with technology and/or with learning how to use a new technology both supported and restricted the use of PDT.

However, educators’ comfort level with technology and with learning how to use a new technology was only restrictive of PDT use at Site B. Moreover, the concern some educators and parents had with respect to the impact of technology on their students/children was restrictive of PDT use at Site A.

Despite these constraints, the comfort level that parents had with using technology and with learning how to use a new technology supported the use of PDT at all sites.

**Team.**

At all sites, the activities among and relationships between educators and parents afforded the use of PDT and, in turn, the home-school connection. First, educators’ main teaching tasks (i.e., observing, documenting, assessing and planning) were aligned with the use of PDT. Second, the strategies many educators used to document and share their students’ learning with their students’ parents (i.e., email, social media and other PDT) supported PDT use. Third, the strategies many educators used to learn a new technology (i.e., “playing around,” using “trial and error” and collaborating with other colleagues) afforded PDT use. Finally, educators’ use of apps with their students was supportive of PDT use.

However, the more traditional strategies that most educators used to communicate with their students’ parents at Site B and some educators used at Site C (i.e., face-to-face and paper notices) constrained PDT use. Moreover, several parents indicated that they did not receive information from their children’s educators about either the daily learning activities of the classroom, the technology that their children were using, or their
children’s social and/or emotional progress on an ongoing basis. Finally, the requirement of some educators to attend a formal training on the use of PDT restricted its use at all sites.

Despite these constraints, the main strategy parents used to support their children’s learning at school (i.e., communicating with their children’s educators) supported PDT use, even as most of the strategies parents used to find out how and what their children were doing (i.e., face-to-face communication, report cards, parent-teacher conferences and asking their children) constrained its use. Still, parents’ attempts to extend and/or reinforce their children’s classroom learning at home afforded the use of PDT.

**Organizational.**

At all sites, the school administration and/or school community both afforded and constrained the use of PDT and, in turn, the home-school connection. School administrations at Sites A, C and D primarily supported PDT use as they were open to their educator’s use of technology, solicited input from their educators before making decisions and had leadership positions to liaise with the principal.

However, most sites had a limited budget for technology (except for Site D). Moreover, some parents’ work schedules restricted their ability to communicate with their children’s educators at drop off and pick up at all sites. Furthermore, school administrators maintained control over whether and when educators could use PDT (except for Site A). Finally, the school administration at Site B took a “top down” approach to decision-making, required certain communications between educators and
parents to be vetted and did not value and/or understand the purpose behind play-based learning /Ontario’s kindergarten curriculum.

Despite these constraints, active parent councils supported the use of PDT at all sites, particularly at Site D where the parent council had a lot of decision-making power and there was a strong sense of school community. Moreover, a school blog (at Site B), parent Facebook groups (at Site D), parent reps (at Site D) and the ability of some parents to communicate with their children’s educators at drop off and pick up supported the home-school connection.

**Political.**

At all sites, the policies and regulations at the school board and provincial level constrained PDT use and, in turn, the home-school connection. First, the school board’s requirement to approve technology before educators could use it restricted PDT use. Second, the school board’s ambiguous policy with respect to personal device use constrained PDT use. Third, the school board’s policy with respect to student privacy restricted PDT use. Fourth, the school board’s failure to provide adequate training on Ontario’s new kindergarten curriculum and new report card constrained PDT use. Fifth, the school board’s policy related to prep time for ECEs restricted PDT use. Finally, the Ontario Ministry of Education’s policy with respect to class size limited PDT use. Despite these constraints, the new play-based kindergarten curriculum and report card supported the use of PDT at all sites.

**CWA interviews (quantitative).**

I used complete versions of the Human-tech ladders at each site to conduct quantitative analyses of educators’ and parents’ responses to the CWA interviews. (See
appendices K, L, M and N for complete versions of Human-tech ladders at each site). As such, the constraints and affordances that were found in each Human-tech category at each site were derived from the total number of factors that educators and parents said either constrained or afforded their ability to do their work (i.e., support their students’/children’s learning) in the work domain (Vicente, 2003). It is important to note that factors were only included in the Human-tech ladders if educators and/or parents explicitly mentioned them in the interviews. Therefore, the number of constraints and affordances in the political category differs across sites even through all sites were subject to the same provincial and school board regulations and policies.

After coding each interview response by Human-tech category and classifying it either as a constraint or affordance, constraints were given negative values and affordances were given positive values. This allowed me to conduct a constraint vs. affordance analysis of each Human-tech category at each site. For example, a total of 11 constraints and 11 affordances were found in the physical category of the Human-tech ladder at Site A. As such, I added -11 to 11 for a finding of 0. Results between 0 and 2 indicated slight differences between constraints and affordances, while results between 3 and 10 represented moderate differences. Finally, findings over 10 indicated significant differences between constraints and affordances. The following sections describe the constraints vs. affordances analyses found in each Human-tech category at each site.

**Site A (constraints vs. affordances analysis).**

The quantitative analysis of the CWA interviews at Site A showed a sum of zero in the physical category of the Human-tech ladder. The psychological and organizational categories yielded moderate surpluses, while the team category showed a significant
surplus. Finally, the CWA interviews yielded a significant deficit in the political
category. (See Table 23 below for a summary of the constraints vs. affordance analysis
at Site A).

Table 23

Summary of Constraints vs. Affordances at Site A

<table>
<thead>
<tr>
<th>Category</th>
<th># of Constraints</th>
<th># of Affordances</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>-11</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Psychological</td>
<td>-18</td>
<td>22</td>
<td>4</td>
</tr>
<tr>
<td>Team</td>
<td>-25</td>
<td>47</td>
<td>22</td>
</tr>
<tr>
<td>Organizational</td>
<td>-10</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>Political</td>
<td>-16</td>
<td>4</td>
<td>-12</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>-80</strong></td>
<td><strong>98</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

Site B (constraints vs. affordances).

The quantitative analysis of the CWA interviews at Site B showed a slight surplus
in the physical category of the Human-tech ladder and a slight deficit in the psychological
category. The organizational category yielded a moderate deficit, while the political
category showed a significant deficit. Finally, there was a significant surplus found in the
team category. (See Table 24 below for a summary of the constraints vs. affordances
analysis at Site B).

Table 24

Summary of Constraints vs. Affordances at Site B

<table>
<thead>
<tr>
<th>Category</th>
<th>Constraints</th>
<th>Affordances</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>-9</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Psychological</td>
<td>-15</td>
<td>13</td>
<td>-2</td>
</tr>
<tr>
<td>Team</td>
<td>-14</td>
<td>30</td>
<td>16</td>
</tr>
<tr>
<td>Organizational</td>
<td>-15</td>
<td>11</td>
<td>-4</td>
</tr>
<tr>
<td>Political</td>
<td>-15</td>
<td>1</td>
<td>-14</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>-68</strong></td>
<td><strong>66</strong></td>
<td><strong>-2</strong></td>
</tr>
</tbody>
</table>
**Site C (constraints vs. affordances).**

The quantitative analysis of the CWA interviews at Site C revealed a sum of zero in physical and organizational categories of the Human-tech ladder. The psychological category showed a slight deficit, while the political category yielded a moderate deficit. Lastly, a significant surplus was found in the team category. (See Table 25 below for a summary of the constraints vs. affordance analysis at Site C).

Table 25

Summary of Constraints vs. Affordances at Site C

<table>
<thead>
<tr>
<th>Type</th>
<th># of Constraints</th>
<th># of Affordances</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>-5</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Psychological</td>
<td>-10</td>
<td>9</td>
<td>-1</td>
</tr>
<tr>
<td>Team</td>
<td>-16</td>
<td>35</td>
<td>19</td>
</tr>
<tr>
<td>Organizational</td>
<td>-10</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Political</td>
<td>-7</td>
<td>1</td>
<td>-6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>-48</strong></td>
<td><strong>61</strong></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>

**Site D (constraints vs. affordances.)**

The quantitative analysis of the CWA interviews at Site D showed slight surpluses in both the physical and psychological categories of the Human-tech ladder. Moderate to significant surpluses were found in the organizational and team categories, respectively. Lastly, the political category revealed a moderate deficit. (See Table 26 below for a summary of the constraints vs. affordances analysis at Site D).

Table 26

Summary of Constraints vs. Affordances at Site D

<table>
<thead>
<tr>
<th>Category</th>
<th>Constraints</th>
<th>Affordances</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>-8</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Psychological</td>
<td>-6</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Team</td>
<td>-6</td>
<td>31</td>
<td>25</td>
</tr>
<tr>
<td>Organizational</td>
<td>-7</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Political</td>
<td>-5</td>
<td>3</td>
<td>-2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>-32</strong></td>
<td><strong>62</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>
Summary (CWA Quantitative).

The quantitative analysis of the CWA interviews with educators and parents showed several common themes with respect to the constraints and affordances that were found in each Human-tech category at each site. These themes are detailed below.

**Physical.**

All sites had either slightly more affordances than constraints or the same amount of affordances as constraints with respect to their physical environment and/or available technology. Sites B and D had the most physical affordances (+2).

**Psychological.**

Sites B and C had slightly more constraints than affordances with respect to the feelings, thoughts and/or beliefs educators and/or parents had about themselves, technology and/or their ability to use technology, while Site D had slightly more affordances. Site A had moderately more affordances.

**Team.**

All sites had significantly more affordances than constraints with respect to the activities among and relationships between educators and parents.

**Organizational.**

Sites A and D had moderately more affordances than constraints with respect to their school administration and/or school community, while Site B had moderately more constraints. Site C had the same amount of affordances and constraints.
**Political.**

All sites had more constraints than affordances with respect to regulations and policies at the provincial and school board levels. Sites A and B had significant deficits, while Sites C and D had moderate and slight deficits, respectively.

**All sites (constraints vs. affordances)**

In comparing constraints vs. affordances analyses across sites, Site D had the most affordances (+30), while Sites A and C had the second (+18) and third (+13) most affordances, respectively. Site B was the only site that had more constraints than affordances (-2). (See Table 27 below for a summary of constraints vs. affordances at all four sites).

Table 27

<table>
<thead>
<tr>
<th>Category / Site</th>
<th>Site A</th>
<th>Site B</th>
<th>Site C</th>
<th>Site D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Psychological</td>
<td>4</td>
<td>-2</td>
<td>-1</td>
<td>2</td>
</tr>
<tr>
<td>Team</td>
<td>22</td>
<td>16</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td>Organizational</td>
<td>4</td>
<td>-4</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Political</td>
<td>-12</td>
<td>-14</td>
<td>-6</td>
<td>-2</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>18</strong></td>
<td><strong>-2</strong></td>
<td><strong>13</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

**Chapter Summary**

This chapter presented the results of the four primary sources of data including learning stories (qualitative and quantitative), surveys (qualitative and quantitative), post-interviews (qualitative) and the CWA interviews (qualitative and quantitative).

In the next chapter, I discuss the aforementioned results as they pertain to the research question: *What are the lessons learned from using cognitive work analysis to implement and evaluate the use of a pedagogical documentation technology in Ontario’s Kindergarten Program.*
Chapter Five: Discussion

Chapter Overview

This chapter uses findings from the four data sources reported in the previous chapter (i.e., learning stories, surveys, post-interviews and CWA interviews) to answer the following question: *What are the lessons learned from using cognitive work analysis to implement and evaluate the use of a pedagogical documentation technology in Ontario’s Kindergarten Program?* In answering this question, I discuss two types of lessons, which include lessons related to pedagogical documentation technology (PDT) and lessons related to cognitive work analysis (CWA) lessons. PDT-related lessons pertain to the implementation and use of a specific pedagogical documentation technology (i.e., Storypark) in a particular context (i.e., 11 kindergarten classrooms in four schools in a large, urban school district in Ontario). CWA-related lessons pertain to the use of cognitive work analysis to evaluate the “Human-tech relationship” between a PDT (i.e. Storypark) and the work domain (Vicente, 2003, p.33). PDT-related lessons are discussed first, followed by the CWA-related lessons.

PDT-related lessons

*PDT supported communication between educators and parents.*

Qualitative data from the CWA interviews with parents revealed that a lack of ongoing communication from educators about the daily learning activities of the classroom was a significant constraint to the home-school connection. This finding was particularly problematic as “communicating with educators” was one of the primary strategies parents used to support their children’s learning. As one parent described it,
“It’s very difficult to support the learning in the classroom without knowing what activities are being done.”

However, quantitative learning story data showed that after Storypark was introduced into the work domain, educators posted an average of 24 learning stories per school day and an average of one and a quarter learning stories per educator per school day. Furthermore, these data showed that parents viewed and commented on educator learning stories an average of 5.4 times and .45 times for each story that was posted, respectively. As such, it is clear that Storypark supported communication between educators and parents.

Data from the parent survey affirmed this finding as approximately 70% of parents said that Storypark either “greatly increased” or “somewhat increased” their level of communication with their children’s educators. Moreover, findings from post-interviews with educators showed that Storypark increased communication between educators and parents as educators said, “There was a lot more ongoing communication” with students’ parents after Storypark was introduced into their classrooms. Furthermore, these data showed that there was a particular increase in communication between educators and parents of students who were in before and aftercare and, in turn, had limited opportunities to talk to their children’s educators at drop off and pick up. As one parent described it, “Storypark increased how much [information] we received and how quickly we received it, so that was an improvement.”

This finding reflects Beaumont-Bates’ (2017) research, which found that e-portfolios increased the speed and frequency with which information about children’s learning was communicated from educators to parents. Moreover, Beaumont-Bates
(2017) found that the use of e-portfolios alleviated the pressure to communicate at drop off and pick up times as parents and teachers had an alternative means to communicate.

Only one educator said that Storypark decreased her level of communication with her students’ parents. She attributed this decrease to the fact that she found another PDT that she had been using prior to Storypark easier to use and, therefore, used Storypark less. However, other educators who had been using the same PDT prior to Storypark said that Storypark neither decreased nor increased their level of communication with their students’ parents.

In addition to increasing educator-parent communication, findings showed that Storypark improved communication between educators and parents. Qualitative data from the CWA interviews with parents revealed that prior to the introduction of Storypark, many educators relied on paper notices and face-to-face interactions at drop off and pick up to communicate with parents about their students’ learning. According to parents, these strategies were ineffective because paper notices would often get lost and parents’ work schedules did not allow them to communicate with their children’s educators on a regular basis.

However, qualitative data from educator learning stories showed that after Storypark was introduced into their children’s classrooms, parents regularly received “descriptive” learning stories about their children’s learning. Moreover, parents commonly made “connection” comments about these stories, which linked their children’s learning at school to their learning at home. As such, it is evident that Storypark improved communication between educators and parents.
Data from the post-interviews affirmed this finding as educators said Storypark improved the quality of communication they had with their students’ parents, irrespective of the communication strategy they were using prior to Storypark (i.e., email, social media and other PDT). This finding reflects both the results of Goodman’s (2013) study, which showed that approximately two-thirds of parents and educators felt e-portfolios helped to strengthen teacher-parent communication “a great deal” or “quite a lot,” and Higgins’ (2015) research, which showed that 75% of parents and 100% of teachers felt that e-portfolios helped to strengthen communication between the home and the ECE setting “a great deal” or “quite a lot.”

**PDT supported the relationship between educators and parents.**

Qualitative data from the CWA interviews showed that prior to the introduction of Storypark, parents lacked regular opportunities to develop relationships to their children’s educators. As many parents had to be at work either before and/or after the school day started/ended, they rarely had a chance to talk to their children’s educators at drop off and pick up. As one parent described it, “The before and aftercare are sort of barriers in a way…just the fact that you're not seeing the teacher when you pick up and drop off, you're seeing a different set of teachers.”

However, data from the educator survey showed that Storypark improved educators’ relationships to parents as approximately 80% of educators said that Storypark had either a “positive” or “somewhat positive” impact on their relationships to their students’ parents. Moreover, data from the parent survey revealed that Storypark improved parents’ relationships to educators as approximately 70% of parents said that
Storypark had either a “positive” or “somewhat positive” impact on their relationships to their children’s educators.

Results from the post-interviews with educators supported this finding as one educator said Storypark “really helped the relationship” [because] there was more trust that there was actually learning happening kindergarten.” Educators also said that parents were more open and “willing to share” after introducing Storypark into their classrooms. As one educator described it,

I think since introducing Storypark parents are more willing to share the stories that happen at home. I don’t see many of the parents. I don’t hear from many of the parents except for on interview night. So, behaviourally, they’re able to share more and know that I see it, because I respond back to it. So I think that’s the biggest behavioural change—especially for those parents who I don’t see at the gate, who don’t drop their kids off, who go to daycare or take the bus.

Quantitative and qualitative data from parent comments about educator learning stories supported this finding as parents regularly made “affirmative” and “appreciative” comments in response to educator learning stories. As one educator described it, “I’d say Storypark strengthened the [educator-parent relationship] in a positive way because [parents] were commenting on the pictures…like, ‘We love this activity, thanks for all you guys do.’ So it just seemed like they almost had a newfound appreciation and respect for us. So that was nice.”

This finding reflects results from Goodman’s survey (2013), which showed approximately two-thirds of the teachers and parents felt e-portfolios helped to strengthen the relationships between parents and educators “a great deal” or “quite a lot.” It also mirrors Higgins’ (2015) research, which found 100% of teachers and parents felt e-
portfolios helped to strengthen the teacher-parent relationship “a great deal” or “quite a lot.” Finally, this finding is consistent with Beaumont-Bates’ (2017) study, which showed that e-portfolios “enhanced and supported” the development of “collaborative partnerships between teachers and parents” (p.353).

**PDT supported parents’ understanding of their children’s classroom learning.**

Data from the CWA interviews revealed that, prior to the introduction of Storypark, parents had a limited understanding of what their children learned about at school. For example, when one parent was asked about the barriers that prevented her from supporting her daughter’s learning, she said she had so little knowledge of what her daughter did at school that she felt like she was sending her into “a black hole.”

However, quantitative data from learning stories showed that after Storypark was introduced into the work domain, parents regularly viewed educator learning stories about their children’s classroom learning. Moreover, qualitative data from learning stories showed that educators often posted “descriptive” stories about the specific learning activities that students took part in during the day. As such, it is evident that Storypark supported parents’ understanding of their children’s classroom learning.

Findings from the parent survey affirmed this finding as approximately 80% of parents said they used Storypark to “see what their children were learning about in the classroom.” Moreover, approximately 90% of parents said that Storypark either “greatly increased” or “somewhat increased” their understanding of their children’s classroom learning. More specifically, parents said Storypark gave them a “window” into classroom activities and that, without Storypark, they would have “almost no idea of what was going on in the classroom.”
Similarly, findings from the post-interviews with parents showed that Storypark increased parents’ understanding of their children’s classroom learning as one parent described Storypark as providing “a little window into [her daughter’s] world,” and another parent said Storypark “allowed [her] to be a fly on the wall” in her daughter’s classroom. Moreover, findings from the post-interviews with educators showed that Storypark made educators’ classrooms “more transparent” and reduced parents’ requests for parent-teacher interviews as “parents already had ongoing insight into what was happening in the classroom.”

Finally, qualitative results from the educator survey showed that Storypark improved parents’ understanding of their children’s classroom learning as educators said parents were “very positive about knowing what their children have been doing” and “enjoyed being informed of the activities in the classroom.”

**PDT supported educators’/parents’ understanding of Ontario’s kindergarten curriculum.**

Qualitative data from the CWA interviews revealed that many educators were unfamiliar with Ontario’s new kindergarten curriculum, as they had received very little training on it from their school board. For example, when one educator was asked about the regulations and policies that impacted how she did her job, she said, “The curriculum document affects how I do my job. The support that I get from the document, from the board will affect how I do my job…because right now we’re waiting to hear [from the school board] about how to use it.”

However, quantitative data from educator learning stories showed that after educators started using Storypark, they consistently referred to the curriculum document as they used an average of 1.4 learning tags for every learning story that they posted.
Moreover, qualitative learning story data showed that educators regularly supported their students’ learning through the specific pedagogical approaches that are outlined in the new curriculum. As such, it is clear that Storypark supported educators’ understanding of Ontario’s kindergarten curriculum.

Data from the educator survey affirmed this finding as approximately 80% of educators said that Storypark had either a “positive” or “somewhat positive” impact on their understanding of Ontario’s kindergarten curriculum. More specifically, educators said Storypark helped them to become more familiar with The Kindergarten Program’s expectations as well as the “four frames.” This was particularly the case for educators who tagged their learning stories with the curriculum’s expectations. As one educator described it, “As I tag the curriculum expectations for each story I am growing more and more familiar with the curriculum.”

These data also showed that Storypark helped educators to explain the kindergarten curriculum to parents as one educator said, “Being able to link to the curriculum has helped me explain to parents the learning that’s happening.” Another educator made a similar comment as he/she said, “Parents can see play-based learning in action AND how what their children do connects back to curriculum.” Furthermore, data from the parent survey showed that Storypark helped parents to become more familiar with the kindergarten curriculum as approximately 70% of parents said that Storypark had a somewhat positive impact on their understanding of Ontario’s kindergarten curriculum. Moreover, parents said that educators’ use of learning tags was particularly helpful in being able to “understand and link to the curriculum.”
Finally, data from the post interviews with parents showed that Storypark supported parents’ understanding of Ontario’s kindergarten curriculum, as one parent said, “I saw [my daughter] doing a lot of play, but because of the [learning] tags at the bottom, I could tell the purpose behind it…So I would definitely say Storypark improved my understanding [of the curriculum], because I didn’t know much about it before.” Similarly, another parent said, “Storypark started to make me familiar with some of the language [of the curriculum]…The tags were very helpful. [They] brought awareness to the picture about the learning.”

**PDT supported parent-child conversations about children’s learning.**

The CWA interviews revealed that parents had a difficult time talking to their children about their day. This was a significant constraint to the home-school connection as “asking my child about [his/her] day” was one of the primarily strategies parents used to support their children’s learning. For example, when one parent was asked what strategies she and her husband used to find out what her daughter was learning at school she said, “Just chatting and talking [to her]…If there was more information about the content of school…we could carry it over. Right now we’re just trying to get information out of her. It’s really our number one goal. Every day we compare notes and come up with very little.”

However, data from the parent survey showed that Storypark improved conversations between parents and their children as Storypark not only helped parents to “start conversations” with their children about their learning but also allowed children to “expand” upon these conversations. As one parent described it, “I can now refer to a pic and [my daughter] will expand on what she is doing in class, with who, etc.”
Data from the post-interviews with parents affirmed this finding as parents said Storypark helped them to “ask better questions” and engage in “better conversations” with their children about their learning. As one parent said, “Storypark gave us a springboard, allowed us to have a better conversation about what was happening at school.” Similarly, educators said Storypark supported conversations between parents and their children as one educator said, Storypark “helps with families’ conversations over the dinner table. When kids get home and say that they did nothing…Storypark sparks a conversation.” Finally, kindergarten students themselves said Storypark supported the conversations they had with their parents about their learning. As one child described it, “Storypark shows my parents what I’ve been doing at school so I don’t have to tell them so much about my day.”

This finding reflects results from Higgins’ (2015) research, which showed that e-portfolios enhanced conversations between parents and their children about children’s learning. It also mirrors outcomes from Beaumont-Bates’ (2017) study, which showed that e-portfolios increased the conversations that parents had with their children about their day.

**PDT supported student learning.**

Qualitative data from the CWA interviews revealed that parents were uncertain about the impact that Storypark would have upon their children. While some parents believed it would have a positive impact, many doubted that their children “would even notice” their educators using Storypark. Moreover, other parents expressed concern that Storypark would have a negative impact on their children as one parent said it allowed him to “creep on his son at school.”
However, data from the educator survey showed that Storypark had a positive impact on students as approximately 80% of educators said that Storypark had a “positive” or “somewhat positive” impact on their relationships to their students. More specifically, educators said students not only were “aware” that their educators were using Storypark, but also “enjoyed being documented” as they frequently asked their educators to send pictures of their learning to their parents.

This data also showed that Storypark helped students to talk about their learning as educators said taking pictures of their students’ learning prompted “more interactions” as well as “longer conversations.” Moreover, educators said Storypark helped them to “celebrate” and “show appreciation” for their students’ learning and that students themselves were “proud” to “show off” of their work.

Data from the parent survey supported this finding as approximately 75% of parents said Storypark had either a “positive” or “somewhat positive” impact on their children. Similarly, post-interviews with parents showed that Storypark had a positive impact as one parent said, “My daughter likes us to know what’s happening [in her classroom]. She likes to have our involvement.”

Finally, data from the post-interviews with students affirmed this finding as the vast majority of students said Storypark made them “feel good” and “proud.” Moreover, students said Storypark helped their parents’ “know more about [their] day” and helped them to “remember” their learning. This finding reflects results from Goodman’s (2015) research, which showed that e-portfolios allowed “children to competently engage with and revisit their learning, make connections to prior experiences and extend their own learning and interests” (p.61).
PDT supported parents’ involvement in their children’s learning.

Data from the CWA interviews revealed that the home-school connection was constrained by several factors. Most significantly, a lack of ongoing communication from educators about the daily learning activities of the classroom made it difficult for parents to know how to support their children’s learning at home. This lack of communication was further restricted by parents’ busy work schedules and difficulties kindergarten children had talking to their parents about their day.

However, quantitative and qualitative data from learning stories and surveys and qualitative data from post-interviews revealed that Storypark not only supported educator-parent communication but also strengthened the educator-parent relationship. Moreover, results showed that Storypark facilitated parents’ understanding of their children’s classroom learning as well as educators’/parents’ understanding of the new kindergarten curriculum. Finally, findings revealed that Storypark supported student learning as well as the conversations that children had with their parents about their learning. As such, it is not surprising that Storypark also supported parents’ involvement in their children’s learning.

Quantitative data from learning stories affirmed this finding as educators posted a total of 3,207 learning stories and parents viewed and commented on these stories a total of 17,254 and 1,444 times respectively. Moreover, qualitative data from learning stories showed that parents regularly made “connection” comments in response to educator learning stories, as this was the second most common category of parent comments posted (i.e., 22% of comments on 550 educator learning stories).
Qualitative data from the educator survey also supported this finding as educators said Storypark made parents feel “more engaged” and “more included” in their children’s learning as it allowed them to “see the learning” that happened in the classroom and supported “back and forth” communication. Moreover, data from the post-interviews with educators showed that Storypark “[got] parents more involved” and “[brought] them into the [Kindergarten] Program.”

Data from the post-interviews with parents also showed that Storypark supported parents’ involvement in their children’s learning at home. As one parent described it, “Storypark helped because I got to see what [my child was] working on at school [and then] encourage that a little bit further at home.” Similarly, another parent said that reading her daughter’s educator’s stories helped her “to identify areas that needed to be worked on at home.”

Results from Goodman’s (2013) survey reflect this finding as approximately 75% of parents and over 90% of teachers felt e-portfolios helped to strengthen parents’ engagement with their children’s learning “a great deal” or “quite a lot.” It also mirrors findings from Goodman’s (2015) follow up study, which showed that e-portfolios helped educators, parents and students “make connections” between the ECE centre and the home. Finally, this finding is consistent with results from Beaumont-Bates (2017), which showed e-portfolios supported parents to become more involved in their children’s learning.

However, despite the aforementioned positive results, quantitative data from learning stories showed that parents only posted 48 learning stories about their children’s learning at home. Moreover, educators infrequently responded to parent comments about
their learning stories as they responded an average of .07 times for every parent comment that was posted. Furthermore, qualitative data from educator learning stories and parent comments showed that the quality of communication between educators and parents was often more surface than substantive as educators posted far more “descriptive” and “self-explanatory” learning stories than “directive” or “in-depth” learning stories and the majority of parent comments about educator learning stories were “affirmative” (i.e., 52% of parent comments posted on 550 educator learning stories).

These results are consistent with findings from Higgins’ (2015) study, which found that the quality of communication between teachers and parents ranged from surface to substantive and that some parents valued the e-portfolio as “a tool for keeping them informed, rather than as a two-way communication tool” (p.75).

Data from the parent survey showed that only (approximately) 55% of parents felt that Storypark had a “somewhat positive” impact on their level of involvement in their children’s learning at home. Moreover, no parents said that Storypark had a “positive” impact on their level of involvement in their children’s learning at home. As such, it is evident that while Storypark supported several key aspects of the home-school connection, the Human-tech relationship between PDT and the users of PDT (i.e., kindergarten educators and parents) could be improved to support a stronger home-school connection.

The Human-tech relationship could be improved to support a stronger home-school connection.

Data from the parent survey showed that the majority of parents were satisfied with their children’s educators’ use of Storypark as approximately 75% said they were either “very satisfied” or “somewhat satisfied.” Moreover, only one parent said he/she
was “somewhat dissatisfied” with his/her child’s educators’ use of Storypark. Furthermore, data from the post-interviews with parents showed that parents had a high level of satisfaction with Storypark itself. For example, when parents were asked what they liked least about Storypark, most cited constraints related to how their children’s educators’ used Storypark, rather than constraints related to the technology.

Despite this relatively high level of satisfaction, data from the learning stories, surveys and post-interviews showed that the use of PDT within the context of Ontario’s Kindergarten Program could be improved not only to increase parent satisfaction but also to strengthen the home-school connection.

First, *PDT use in Ontario’s Kindergarten Program could be improved by sharing more stories about students’ learning*. Quantitative data from the learning stories showed that while educators regularly posted stories about their students’ learning, (i.e., an average of 24 learning stories per school day and an average of 1.25 learning stories per educator per school day), they had an average of 27 students per classroom. Therefore, parents received far fewer learning stories than educators posted.

Data from the first educator survey and parent survey affirmed this finding as the majority of educators said they used Storypark “a few times per week or more,” while the majority of parents said they used Storypark “less than a few times per week.” These data also revealed that parents had different expectations with respect to how often educators should post learning stories as one educator said, “I have had a couple parents wondering why [learning stories] aren't coming home more often.” Furthermore, these data showed that, according to at least one parent, “more frequent postings” would improve educators’ use of Storypark. Finally, findings from the post-interviews with
parents showed that many parents were dissatisfied with the number of learning stories they received. For example, when one parent was asked what would make Storypark better she said, “Nothing about Storypark itself. I would just say the frequency of posts.”

Second, *PDT use in Ontario’s Kindergarten Program could be improved by posting more substantive learning stories*. Qualitative learning story data showed that the vast majority of educator learning stories were “self-explanatory” and “descriptive” stories, which provided surface details about student learning, rather than substantive information to further parents’ understanding of their children and/or their learning. While these stories increased parents’ understanding of their children’s classroom learning, (i.e., approximately 90% of parents said Storypark had a positive or somewhat positive impact on their understanding of their children’s classroom learning), they did less to transfer the learning from the classroom to the home.

Data from the post-interviews with parents supported this finding as several parents said they did not “rely” on educator learning stories to support their children’s learning at home because they were too infrequent and/or vague to “expand upon.” When one parent was asked whether Storypark was a useful tool for him as a parent, he said, “Not yet.” He went on to say that his child’s educators’ learning stories were “accompanied by a minimal amount of descriptive information and not enough information on what’s going on or what’s happening” to make them “useful.” Moreover, data from the post-interviews with educators showed that while Storypark helped support the “continuity” between their students’ classroom learning and the learning they did at home, parents did not necessarily expand upon or “extend” this learning.
This finding was particularly surprising as qualitative data from the CWA interviews showed that prior to the introduction of Storypark, parents attempted to extend and/or reinforce their children’s learning in the home environment. Moreover, data from the post-interviews showed that while approximately 80% of parents said they used Storypark to “see what their children were learning about in the classroom,” the majority of parents (i.e., approximately 60%) said they wanted to start using Storypark to “extend and/or reinforce [their] children’s learning at home.” As such, it seems likely that parents would have used Storypark to extend and/or reinforce their children’s learning in the home environment if educators’ had posted learning stories with more substantive information.

Third, PDT use in Ontario’s Kindergarten Program could be improved by increasing two-way communication between educators and parents. Consistent with Higgins’ (2015) findings, quantitative learning story data showed that educators mostly used Storypark for one-way communication with their children’s educators (i.e., to share a learning story), rather than for two-way communication (i.e., to respond to parents’ comments) as educators only responded to parents’ comments an average of 0.07 times for each comment that was posted. These data also showed that parents passively viewed educator’s learning stories 12 times more than they actively commented on them. Finally, these data showed that a small minority of parents used Storypark to share stories about their children’s learning at home as parents only posted 48 learning stories.

Data from the parent survey supported this finding, as the two most prevalent responses to the question, “How often do you comment on your child’s educators’ learning stories?” were “sometimes” and “not very often.” Moreover, the most common
response to the question, “How often do you post a story about your children’s learning?” was “never” as approximately 60% of parents answered this way. Furthermore, qualitative data from the learning stories showed that parents most commonly posted “affirmative” comments in response to their children’s educators’ learning stories, which simply served to acknowledge the learning that took place in the classroom, rather than to ask questions about it or to provide additional information.

Post-interview data also showed that educators used Storypark more for one-way communication as one parent said, “At the beginning I’d ask some questions of the teachers…but the response wasn’t really what I was expecting so I figured Storypark wasn’t an avenue where…they’re looking for input or that sort of interaction. [So] I think Storypark is more of a display. This is what your child is doing…It was one-way communication.” Another parent said she did not post learning stories about her child’s learning at home because “it was not clear” that her child’s educators would be “interested” in reading them. As such, the parent said she was “looking for more clarity around how Storypark should be used.” Similarly, another parent said “having a little instruction on how to use Storypark would be helpful” as she said, “A lot of parents were scared to use Storypark because they [did not] want to overwork the teacher and they [did not] know what they should be putting on Storypark.”

Data from the parent survey also showed that parents were unclear about how to use Storypark as one parent said she did not post comments because it was “unclear who read them and if comments [were] expected or welcomed.” Moreover, another parent said, “Stories were not acknowledged/commented on by the teacher, therefore, there was no perceived value in posting them.” As such, in addition to increasing two-way
communication between educators and parents, *PDT use in Ontario’s Kindergarten Program could be improved by communicating with parents about how to use PDT.*

Finally, *PDT use in Ontario’s Kindergarten Program could be improved by involving kindergarten students in the use of PDT.* Qualitative data from learning stories showed that students very rarely posted learning stories of their own (with their parents’ help). Moreover, this data showed that students very rarely made comments in response to their educators’ learning stories (with their parents’ help). As such, students very rarely used Storypark directly.

Data from the parent survey showed that students also very rarely used Storypark indirectly as only 25% of parents said they used Storypark with their children. Similarly, data from the educator survey showed that educators rarely used Storypark with their students as only three educators (out of 19) said they used Storypark “to share students’ learning with students.” Moreover, one educator said, “I generally don't share [learning] stories with the kids... this is something I need to get better at.”

However, despite this lack of exposure to Storypark, data from the educator survey showed that many students not only were aware that their educators were using Storypark to document and share their learning with their parents but also enjoyed having their work documented/shared, as they frequently asked their educators to send pictures of their learning to their parents.

Data from the post-interviews with students supported this finding as the vast majority of students said they liked having their educators document and share their learning with their parents because it made them “feel good” and “proud.” Furthermore, students said that Storypark helped their parents to “know more about [their] day” and
helped them to “remember” their learning. As such, it is critical that educators and parents involve their students/children in the use of PDT.

CWA-related lessons

CWA predicted which sites used PDT the most and least effectively.

The original intention of this design study was to use CWA to examine and inform the implementation and use of a PDT (i.e., Storypark) in Ontario’s Kindergarten Program. Therefore, I had hoped to conduct the CWA interviews prior to the introduction of Storypark into the work domain. However, the compressed timeline of the school year made it necessary for me to conduct the CWA interviews simultaneous to and, in some cases, after the introduction of Storypark. As such, data from the CWA were primarily used to inform subsequent rounds of data collection, rather than to instruct the implementation and/or design process.

However, in addition to using CWA to inform data collection, I was also able to use CWA to predict which sites would use PDT the most and least effectively. For example, through conducting a constraints versus affordances analysis of each Human-tech category at each site, I was able to predict that Site D would use PDT most effectively (as it had a net positive value of 30), while Site B would use PDT the least effectively (as it had a net negative value of -2).

Quantitative data from educator learning stories supported these predictions as Site D posted the most learning stories per educator per school day, had the most parent views per learning story, had the most parent comments per learning story and had the most educator responses to parent comments. Moreover, while Site C posted the least number of learning stories per educator per school day and Site A had the least amount of
parent views per learning story, Site B did not use learning tags, had the least amount of parent comments per learning story and had the least number of educator responses to parent comments.

Furthermore, qualitative data from learning stories showed that learning stories at Site D were more substantive in their quality of communication than learning stories at Site B as educators at Site D posted the most “directive” learning stories and educators at Site B posted the most “self-explanatory” learning stories. These data also showed that parent comments at Site D were more substantive than parent comments at Site B. For example, 61% of the comments analyzed at Site B were “affirmation” comments, while only 49% of the comments analyzed at Site D were “affirmation” comments. Finally, data from the post-interviews with students showed that five out of the six students interviewed at Site D could explain what Storypark was used for, while only two out of the six students interviewed at Site B could explain what Storypark was used for. A such, students at Site D were much more aware of their educators’/parents’ use of Storypark than students at Site B.

CWA identified which factors need to be modified to support a stronger Human-tech relationship between PDT and the users of PDT.

In addition to predicting which sites would use PDT the most and least effectively, data from the CWA interviews provided useful qualitative information with respect to the specific constraints and affordances that restricted and supported the use of PDT in Ontario’s Kindergarten Program.

In the physical category of the Human-tech ladder, findings showed that the physical environment and/or available technology were primarily supportive of educators’ use of PDT as all educators had access to at least one tablet computer. At the
same time, a weak and/or slow Internet connection restricted the speed and efficiency with which educators could document and share learning stories with their students’ parents. However, results also revealed that parents had a variety of technologies that supported the use of PDT as well as access to the Internet. Therefore, parents’ use of PDT was not constrained by physical factors.

In the psychological category of the Human-tech ladder, data showed that the thoughts, feelings and/or beliefs educators had about themselves, technology and/or their abilities to use technology were both supportive and restrictive of educators’ use of PDT. More specifically, comfort level was a significant psychological factor in determining the extent to which educators used PDT. For example, Site B was the only site that only had educators who were very uncomfortable with technology, while the other sites had some educators who were very comfortable with technology and some educators who were very uncomfortable with technology. Finally, the thoughts, feelings and/or beliefs that parents’ had about themselves, technology and/or their abilities to use technology afforded the use of PDT, as the vast majority of parents were comfortable with technology and with learning a new technology.

In the team category of the Human-tech ladder, data showed that the activities among and relationships between educators and parents were significantly more supportive of the use of PDT than they were restrictive as educators’ main teaching tasks (i.e., observing and assessing students’ learning, following their students’ interests and planning learning activities according to their students’ interests) were aligned with central functions of PDT. Moreover, PDT was designed to facilitate the main strategy parents used to support their students’ learning (i.e., communicating with their children’s
educators). However, some team factors such as the strategy some educators used to learn a new technology (i.e., attending a formal training) were restrictive of PDT use. Moreover, the strategies most educators used to communicate with their students’ parents (i.e., face-to-face communication and paper notices) at Sites B and C also constrained PDT use. Despite these constraints, the vast majority of team factors afforded the use of PDT.

In the organizational category of the Human-tech ladder, data showed that school administrations and/or school communities mediated the extent to which physical, psychological, team and political constraints restricted PDT use. This was evidenced by the fact that the least effective site (Site B) was the only site in which the school administration took a “top-down” approach to decision-making, “vetted” certain communications between educators and parents and did not understand and/or value play-based learning or The Kindergarten Program curriculum. Moreover, Site B was the only site in which the kindergarten team did not have a designated leader to liaise with the principal. On the contrary, the most effective site (Site D) was the only site in which the parent council had a lot of decision-making power and a strong sense of school community.

Finally, in the political category of the Human-tech ladder, data showed that provincial and school board policies were significantly more restrictive of PDT use than they were supportive. More specifically, the school board’s policies pertaining to student privacy and educators’ use of personal devices constrained PDT use. Moreover, the school board’s requirement to approve educators’ use of PDT before they could use it restricted its use. Finally, the school board’s “no prep time” policy for ECEs constrained
PDT use. On the provincial level, the Ontario Ministry of Education’s policy pertaining to class size constrained PDT use as large class sizes made it more difficult for educators to document and share their students’ learning. However, the Ministry of Education’s new, play-based kindergarten curriculum and report card supported the use of PDT.

**Chapter Summary**

This chapter discussed the four primary data sources as they related to the central research question: *What are the lessons learned from implementing and evaluating the use of a pedagogical documentation technology in Ontario’s Kindergarten Program?* In this discussion I identified two types of lessons: PDT-related lessons and CWA-related lessons. PDT-related lessons included: 1) PDT supported educator-parent communication, 2) PDT supported the educator-parent relationship, 3) PDT supported parents’ understanding of their children’s classroom learning, 4) PDT supported educators’/parents’ understanding of Ontario’s new kindergarten curriculum, 5) PDT supported parent-child conversations about children’s learning, 6) PDT supported student learning, 7) PDT supported parents’ involvement in their children’s learning and 8) the Human-tech relationship could be improved to support a stronger home-school connection within the context of Ontario’s Kindergarten Program. CWA-related lessons included: 1) CWA predicted which sites would use PDT the most and least effectively and 2) CWA identified which factors need to be modified in order to support a stronger Human-tech relationship between PDT and the users of PDT (i.e., kindergarten educators, parents and students in Ontario’s Kindergarten Program).
In the next chapter, I summarize the research findings and discuss: the implications of the research findings, the limitations of the research study, areas for future research and the significance of the study.
Conclusion

Chapter Overview

In the previous chapter, I discussed two types of “lessons learned” from using cognitive work analysis (CWA) to implement and evaluate a pedagogical documentation technology (PDT) in Ontario’s Kindergarten Program including PDT-related lessons and CWA-related lessons. This chapter presents a summary of the research findings, the implications of these findings, the limitations of the research study as well as areas for future research. Finally, the chapter discusses the significance of the research study.

Summary of Findings

The purposes of this research study were three-fold: 1) To understand the impact of a specific PDT (i.e., Storypark) on the home-school connection within the early learning context of Ontario’s Kindergarten Program, 2) To uncover promising practices for PDT use within this context and 3) To identify lessons learned from using cognitive work analysis to implement and evaluate the use of a pedagogical documentation technology in Ontario’s Kindergarten Program. To accomplish this end, I applied an adaption of cognitive work analysis, called the Human-tech framework, to a design research protocol to investigate one central research question: What are the lessons learned from using cognitive work analysis to implement and evaluate the use of a pedagogical documentation technology in Ontario’s Kindergarten Program?

Four primary sources of data were used to answer the aforementioned research question including learning stories, surveys, post-interviews and CWA interviews. In triangulating quantitative and qualitative results from multiple data sources, I found that PDT supported the home-school connection. This finding is consistent with results from

More specifically, findings from the research study showed that PDT supported the home-school connection by increasing and improving educator-parent communication; supporting the educator-parent relationship; facilitating parents’ understanding of their children’s classroom learning; supporting educator’s/parents’ understanding of Ontario’s new kindergarten curriculum and/or play-based learning; facilitating parent-child conversations about children’s learning; supporting student learning and, finally, increasing parents’ involvement in their children’s learning.

However, despite the aforementioned findings, results also showed that the Human-tech relationship between PDT and the users of PDT (i.e., kindergarten educators, parents and students) could be improved to support a stronger home-school connection within the work domain (i.e., Ontario’s Kindergarten Program) as PDT had only a somewhat positive impact on approximately 55% of parents’ levels of involvement in their children’s learning at home.

Findings from learning stories, surveys and post-interviews showed that several improvements could be made to enhance the use of PDT. These improvements included: posting more learning stories, posting more substantive learning stories, increasing two-way communication between educators and parents, providing parents with more information on how to use PDT and involving students in the use of PDT.

Data from the CWA interviews provided useful qualitative information with respect to the Human-tech factors that need to be modified in order to support a stronger home-school connection within the work domain. More specifically, findings showed
that the political category of the Human-tech ladder was significantly restrictive of PDT use. As such, modifying school board policies with respect to educators’ use of information and communication technologies would greatly enhance PDT use and, in turn, the home-school connection. Furthermore, modifying the Ontario Ministry of Education’s policy with respect to class size would improve PDT use and, thus, would promote a stronger home-school connection.

Finally, data from the CWA interviews showed that the organizational category of the Human-tech ladder was both supportive and restrictive of PDT use. More specifically, Sites A, C and D had school administrations that supported educators’ use of PDT, while Site B did not. Qualitative and quantitative data from the learning stories affirmed that Site D used PDT most effectively, while Site B used PDT least effectively. As such, it is evident that a supportive school administration is particularly important in promoting effective PDT use and, in turn, supporting a strong home-school connection.

**Implications**

**Ontario’s Kindergarten Program.**

The aforementioned findings have several implications for educators, parents and students in Ontario’s Kindergarten Program. First, it is evident that kindergarten educators should consider adopting PDT to support greater parental involvement in their students’ learning at school and at home. However, it is equally clear that educators, parents and students must use PDT purposefully in order for it to have an optimal effect. Therefore, kindergarten educators need to have much more training than they had for this study and should be educated with respect to promising practices for PDT use.
Data from the learning stories, surveys and post-interviews suggested that promising practices for PDT use include the following: 1) Tagging learning stories with The Kindergarten Program’s expectations, 2) Posting learning stories regularly and consistently, 3) Posting substantive learning stories, which provide specific information to further parents’ understanding of their child and/or his/her learning, 4) Encouraging “connection” comments from parents about learning stories, 5) Promoting two-way communication by responding to parents’ comments, 6) Providing parents with clear guidelines with respect to what they should post as well as what they should expect their child’s educators to post and, finally, directly involving students’ in the use of PDT.

The aforementioned findings also have implications for the organizational and political levels surrounding Ontario’s Kindergarten Program. First, school administrations need to understand the crucial role they play in supporting educators’ use of PDT and, in turn, the home-school connection. Second, the school board should ensure policies pertaining to educators’ use of information and communication technologies are aligned to eliminate constraints related to the use of PDT. Finally, the Ontario Ministry of Education should cap the size of kindergarten classrooms so that educators can carry out the primary principles of the new kindergarten curriculum (i.e., learning through play, pedagogical documentation and parental involvement) more effectively.

CWA.

The aforementioned findings also have implications for CWA as an analytical tool for understanding and designing for socio-technological work environments. Although I was not able to use CWA to inform the design and/or implementation of a
PDT into Ontario’s Kindergarten Program, results showed that CWA could be used to predict the extent to which workers would successfully adopt a given technology into the work domain (as was the case for Site D).

Secondly, findings revealed that CWA could be used to identify the specific Human-tech factors that both constrained and afforded the use of a PDT within Ontario’s Kindergarten Program. As such, results showed that CWA could be used to modify the work domain in order to support a stronger Human-tech relationship between a given technology and its users.

**Limitations**

While this research study produced promising and positive findings, it also has limitations. First and foremost, I was unable to carry out the original intention of the research design, which was to use CWA to inform the implementation of a PDT into Ontario’s Kindergarten Program. Due to the large number of educators participating in the study (19) as well as the compressed time line of the school year, I was only able to complete a single iteration of the design research cycle. While this iteration yielded useful data with respect to the impact that a PDT had upon the home-school connection as well as suggestions for improving PDT use, I was not able to test, analyze and/or modify these improvements through subsequent iterations of data collection and, in turn, complete the research design.

Another limitation of the research study is that it only includes the perspective of 16 parents. Moreover, five out of the 11 classrooms in the study had only one parent reporting on their child’s educators’ use of Storypark. The research study would have been stronger if it had included the perspectives of multiple parents per class. This would
have allowed me to analyze survey data at each site and make more robust comparisons of parents’ use of PDT across sites.

Similarly, the research study would have been improved by increased participation from principals. Since one of the principals was unable to complete a full CWA interview, I did not include any of the principal data in the Human-tech ladders. Therefore, constraints and affordances related to the organizational category of the Human-tech ladder were identified without the perspectives of the school administrations themselves. Moreover, no principals were able to take part in post-interviews. As such, it is unclear how the principals felt about the impact of PDT on the home-school connection. This missing perspective is particularly limiting given the fact that educators identified “a supportive administration” as critical to the success of PDT use.

Another limitation of the research study is that the number of participants differed across sites. More specifically, Site A had significantly more educator, parent and student participants than the other three sites. Moreover, educators at Site A used the PDT longer than the other three sites as it was the first site to implement the technology. Finally, all four sites had similarly high LOI ratings and, therefore, were all relatively well-resourced schools. While this allowed me to make comparisons across sites, I was not able to learn how the impact of PDT might differ at sites with lower LOI ratings.

A further limitation of the study is that the concept of the home-school connection was not operationalized. Therefore, I was not able to conduct pre-tests to measure the home-school connection at each site prior to the introduction of PDT nor was I able to administer post-tests to quantify the extent to which the home-school connection
increased as a result of introducing PDT into the work domain. Having this data would have strengthened my contention that PDT use supported the home-school connection.

Finally, the research study was a design research study, which was focused on “developing a qualitative and quantitative profile” of a particular phenomenon (i.e., PDT use in Ontario’s Kindergarten Program) rather than an experimental study that tested a specific hypothesis (Collins et al., 2004, p.20). Therefore, the study did not yield results that can be readily generalized to other technologies and early learning contexts.

**Areas for Future Research**

While this study was able to describe the impact that a PDT had upon the home-school connection in Ontario’s Kindergarten Program, as well as suggest promising practices for PDT use within this context, it fell short of testing these “promising practices.” As such, a logical next step is for researchers to complete further iterations of the design research cycle in order to refine the use of PDT within the work domain.

Another area for future research is to examine educator-parent communication via PDT. While this study, along with Higgins’ (2015) research, provided a starting point for understanding the types of communication that take place between parents and educators through PDT, it is not yet known which types of communication are most beneficial to educators, parents and young children. Therefore, it is critical to conduct an in-depth analysis of learning stories, comments and responses to determine which content is most supportive of the home-school connection.

A further area for future research is to examine the impact of PDT on young children’s learning when they are fully engaged in the use of PDT both directly and indirectly. As the kindergarten students were only peripherally involved in the use of
PDT in this research study, it is crucial to understand how students’ learning (and sense of agency) might be impacted when they are permitted to fully engage with PDT and, in turn, take more ownership over their learning.

Finally, an area for further research is to conduct a randomized control trial of PDT use within an ECE setting, as this would allow researchers to generalize the effects of PDT to other similar technologies and settings. If PDT use is shown to increase the home-school connection, it can then be tested in other types of learning environments, such as sites with low LOI scores, to see if it supports the home-school connection within these contexts as well.

**Significance**

As there were two types of lessons learned throughout the course of this research study, (i.e., PDT lessons and CWA lessons), the significance of this thesis is also two-fold. First, this study is significant to research pertaining to PDT/e-portfolio use within the context of ECE as it is the first known systematic research study to examine the use of PDT within an early learning setting in Canada. Furthermore, the results of this study were consistent with research conducted on e-portfolio use in ECE centres in New Zealand. Therefore, it adds to an emerging, international evidence base, which suggests that PDT can be used to support parent-educator communication, the parent-educator relationship, parent-child conversations about young children’s learning as well as young children’s learning itself.

Additionally, this study is the first of its kind to attempt to identify the promising practices for PDT use within the early learning context of Ontario’s Kindergarten Program. As such, kindergarten educators in Ontario can use this study to guide their use
of PDT within the Kindergarten Program. Moreover, Ontario district school boards and the Ontario Ministry of Education can refer to this research to revise policies related to educators’ use of information and communication technologies. In doing so, PDT use can be improved to support a stronger home-school connection.

Finally, this research adds to the growing number of studies that have used CWA to examine the use of a particular technology within an educational context. In doing so, the study showed that CWA could be used to predict the extent to which a PDT would be successfully incorporated into the work domain. Moreover, it revealed that CWA could be used to identify the specific Human-tech factors that need to be modified to support a stronger Human-tech relationship between a PDT and its users.
References


McCain, M. N. (2012). In Mustard J. F., McCuaig K., Margaret & Wallace McCain Family Foundation and Canadian Electronic Library (Firm) (Eds.), *Early years study 3: Making decisions, taking action.* Toronto, Ont: Margaret & Wallace McCain Family Foundation.


Nirula, L. *Designing constraint informed handheld-supported literacy innovations for struggling readers* Retrieved from https://www.learntechlib.org/p/127112


Appendix A

CWA Interview Questions for Principals

Adapted from Nirula (2009) – Protocol Reference #17598

WORK DOMAIN

1. Describe your role here in the school? Within the school board?
2. What are the two main goals you have for yourself here in your school?
3. What do you have to do to reach your goals?
4. What else can help you to reach your goals? (People or Resources)
5. How do you know when you’ve reached your goals?
6. If you were to write a “Mission Statement” relating to your goals, what would it say?

Environment:

1. What regulations/policies at the Ministry, Board or School levels affect how you do your job?
2. What specific policies influence the decisions you make around introducing a new technology in your school?
3. What physical aspects of the school (i.e.- the building, etc.) influence a) your ability to do your job b) the decisions you make around introducing a new technology in your school?

CONTROL TASKS

1. What needs to happen before you can introduce a new technology in your school?
2. What steps would you need to take in order to introduce a new technology in your school?
3. What expectations do you have of your teachers and ECEs before they can start using a new technology in your school? Students? Parents?

STRATEGIES

1. What are some of the possible strategies that teachers and ECEs can use to become proficient at using a new technology? Students? Parents?
2. Which of the above strategies do you think your teachers and ECEs use most often? Which of the above strategies do you think your students use most often? Parents?
3. Can you think of a time when you introduced a new initiative in your school and it did NOT go well? Why do you think it did NOT work?
4. Can you think of a time when you introduced a new initiative in your school and it did go well? How did you measure its success? To what do you attribute its success?

SOCIAL-ORGANIZATIONAL

1. Who do you depend on to help you with your responsibilities here in the school?
2. Describe the various teams you work in? How do you usually decide on what responsibilities each person has when working within these teams?
3. How is the Kindergarten Program organized in the school? What specifically is your role in relation to the Kindergarten Program?
4. Describe how decisions in the school are usually made?
5. How is technology in the school managed? Who is in charge of making sure technology is working properly? Who is in charge of making sure technology is accessible to use by teachers and ECEs? Students? Parents?
6. What role do you see your school playing within the TDSB? What role do you see your school playing within the community?

**WORKER COMPETENCIES**

1. What personal attributes or challenges do you have that make your job more difficult at times?
2. What personal attributes or skills do you have that make your job easier at times?
3. Describe your comfort level using technology.
4. In what ways do you use technology in your job? Daily life?
5. What personal challenges do you have that make using technology in your school more difficult for you?
6. What expectations do you have for this study? What impact do you think introducing a new technology will have upon Kindergarten teachers and ECEs? Students? Parents? The Kindergarten Program? The school?
Appendix B

CODING KEY

FIVE “HUMAN-TECH” CATEGORIES:

- **Physical**: Describes the physical limitations/opportunities of the “cognitive work” environment,” (i.e.-the school, classroom and home). Usually describes things.

- **Psychological**: Describes the personal traits of the “workers” (i.e.- the educators, parents and students) as well as how they personally cope with the demands of their “work,” (i.e.- teaching, parenting and learning). Usually describes personal attributes and/or how people feel/ think / believe about their work.

- **Team**: Describes the informal processes of how the “workers” communicate and make decisions about their “work” in the “cognitive work environment.” Usually describes workers’ goals, tasks, strategies related to their work, including communication and decision- making strategies.

- **Organizational**: Describes school-based, administrative policies/culture and policies/culture related to parents’ roles in the broader, school community and policies/culture related to parents’ formal jobs, (i.e.-their work hours, work schedule, etc.).

- **Political**: Describes ministry, school board or union policies that mandate specific requirements of the “cognitive work environment.” This category would include items related to the Toronto District School Board, Ministry of Education or Teacher’s Union policies.

CONSTRAINTS VS. AFFORDANCES:

**Constraint (-)**: These are factors that limit a person’s ability to do his/her work according to the worker’s point of view. They are also factors that prevent the technology (an app called Storypark) from being used or implemented into the work environment as effectively and efficiently as possible. (*Efficient worker strategies include: playing, jumping in, trial and error and asking/collaborating with more proficient colleagues. Strategies other than the ones listed above are coded as constraints).

**Affordance (+)**: These are items that facilitate a person’s ability to do his/her work according to the worker’s point of view. They are also factors that allow the technology (an app called Storypark) to be used or implemented into the work environment as effectively and efficiently as possible. (*Efficient worker strategies include: playing, jumping in, trial and error and asking/collaborating with more proficient colleagues. These strategies are coded as affordances).
INSTRUCTIONS FOR CODING:

1. Please use the coding instructions below to code the following items according to whether they belong in the physical, psychological, team, organization or political category. Color code each item by highlighting each sentence according to its category.

   • **Physical**: Describes the physical limitations/opportunities of the “work environment,” (i.e.-the school, classroom and home).
   • **Psychological**: Describes personal traits of educators, parents and students as well as how they personally cope with the demands of their “work,” (i.e.-teaching, parenting and learning). Usually describes how people feel/think about their work.
   • **Team**: Describes the informal processes of how educators, parents and students interact, communicate and make decisions about their “work” in the “work environment,” (i.e.-the school, classroom and home). Usually describes what people do to carryout their work.
   • **Organizational**: Describes school-based, administrative policies/culture and policies/culture related to parents’ roles in the broader, school community as well as policies/culture related to parents’ formal jobs, (i.e.-their work hours, work schedule, etc.).
   • **Political**: Describes Ministry of Education (M of E), or school board policies that mandate specific requirements of the “work environment,” (i.e.- the school, classroom and home).

Example:

1. Each classroom has an ipad.
2. Kindergarten educators don’t communicate well.
3. Ministry of Education’s play-based curriculum is more in line with how educators teach/young children learn.

2. Once you have determined which category the item belongs in, code the item according to whether or not it is a constraint or affordance. Constraints are items that limit the “work environment,” (i.e.-school, classroom, and home) or limit educators, parents, and students’ ability to do their “work,” (i.e.-teach, parent, and learn). Affordances are items that facilitate the “work environment” or facilitate educators, parents, and students’ ability to do their “work.” Assign a (-) value to constraints and a (+) value to affordances.

Example:

1. Each classroom has an ipad. (+)
2. Kindergarten educators don’t communicate well. (-)
3. Ministry of Education’s play-based curriculum is more in line with how educators’ teach / young children learn. (+)

3. Once you have color coded and assigned values to each item. Copy each item into the Human-Tech Ladder into the correct box.

Example: Human-Tech Ladder

<table>
<thead>
<tr>
<th>Category</th>
<th>Constraint (-)</th>
<th>Affordance (+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td></td>
<td>I. Each classroom has an ipad</td>
</tr>
<tr>
<td>Psychological</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team</td>
<td>1. Kindergarten educators don’t communicate well.</td>
<td></td>
</tr>
<tr>
<td>Organizational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political</td>
<td></td>
<td>I. Ministry of Education’s play-based curriculum is more in line with how educators teach and kids learn.</td>
</tr>
</tbody>
</table>

4) Lastly, tally the items up and fill in the Summary Table.

Example: Summary Table:

<table>
<thead>
<tr>
<th>Type</th>
<th># of Constraints</th>
<th># of Affordances</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Psychological</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Team</td>
<td>-1</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>Organizational</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Political</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total:</td>
<td>-1</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Appendix D

Educator Survey

1. How often do you *usually* use Storypark?
   - A few times per day
   - One time per day
   - A few times per week
   - One time per week
   - Less than one time per week
   - Other

2. In your classroom who *usually* uses Storypark?
   - Only me
   - Mostly me
   - Me and my teaching partner equally
   - Mostly my teaching partner
   - Only my teaching partner
   - Other

3. For what purpose(s) do you currently use Storypark?
   - To document individual student's learning
   - To document classroom learning
   - To share individual student's learning with parents
   - To share classroom learning with parents
   - To tag students' learning with curriculum expectations
   - To write reports
   - To share students' learning with students
   - To reflect on teaching practice
   - To plan teaching activities
   - To plan/collaborate with teaching partner
• I don't currently use Storypark
• other

4. What else would you like to start using Storypark for?
• To document individual student's learning
• To document classroom learning
• To share individual student's learning with parents
• To share classroom learning with parents
• To tag students' learning with curriculum expectations
• To write reports
• To share students' learning with students
• To reflect on teaching practice
• To plan teaching activities
• To plan/collaborate with teaching partner
• Other

5. How do you think Storypark is impacting your teaching practice?
• Positively
• Somewhat positively
• Neither positively nor negatively
• Somewhat negatively
• Negatively

Please explain your answer:

6. How do you think Storypark is impacting your relationship to your students?
• Positively
• Somewhat positively
• Neither positively nor negatively
• Somewhat negatively
• Negatively
Please explain your answer:

7. How do you think Storypark is impacting your relationship to your students’ parents?
   - Positively
   - Somewhat positively
   - Neither positively nor negatively
   - Somewhat negatively
   - Negatively

Please explain your answer:

8. How do you think Storypark is impacting your relationship to your teaching partner?
   - Positively
   - Somewhat positively
   - Neither positively nor negatively
   - Somewhat negatively
   - Negatively

Please explain your answer:

9. How do you think Storypark is impacting your understanding of the new curriculum?
   - Positively
   - Somewhat positively
   - Neither positively nor negatively
   - Somewhat negatively
   - Negatively

Please explain your answer:

10. What else would you like to say about your use of Storypark?
Appendix E
Parent Survey

1. How often do you usually use Storypark?
   • A few times per day
   • One time per day
   • A few times per week
   • One time per week
   • Less than one time per week
   • Other (please specify)

2. In your home who usually uses Storypark?
   • Only me
   • Me and my partner only
   • Me and my child only
   • Me, my partner and my child only
   • Me, my partner, my child and other family members
   • Other

3. For what purpose(s) do you currently use Storypark?
   • To see how my child's day is going
   • To see what my child is learning in the classroom
   • To monitor the progress my child is making in terms of his/her learning
   • To monitor my child's behaviour in the classroom
   • To get a better understanding of the Kindergarten curriculum
   • To share my child's learning with family or friends
   • To extend/reinforce the learning my child does at school at home
   • To post stories about my child's learning at home
   • To plan/collaborate/communicate with my child's teacher(s)
• To comment on stories my child's teacher(s) has/have posted
• I don't currently use Storypark
• Other

4. What else would you like to start using Storypark for?
• To see how my child's day is going
• To see what my child is learning in the classroom
• To monitor the progress my child is making in terms of his/her learning
• To monitor my child's behaviour
• To get a better understanding of the Kindergarten curriculum
• To share my child's learning with family or friends
• To extend the learning my child does at school at home
• To post stories about my child's learning at home
• To plan/collaborate/communicate with my child's teacher(s)
• To comment on stories my child's teacher(s) has/have posted
• I don't want to use Storypark for anything else
• Other

5. How has your use and/or your child's teacher(s)' use of Storypark impacted your understanding of what your child is learning in the classroom?

• Has greatly increased it
• Has somewhat increased it
• Has not impacted it
• Has somewhat decreased it
• Has greatly increased it

Please explain your answer:
6. How has your use and/or your child's teacher(s)' use of Storypark impacted your level of involvement in your child's learning at home?

- Has greatly increased it
- Has somewhat increased it
- Has not impacted it
- Has somewhat decreased it
- Has greatly increased it

Please explain your answer:

7. How has your use and/or your child's teacher(s)' use of Storypark impacted your relationship to your child's teacher(s)?

- Positively
- Somewhat positively
- Neither positively nor negatively
- Somewhat negatively
- Negatively

Please explain your answer:

8. How has your use and/or your child's teacher(s)' use of Storypark impacted your level of communication with your child's teacher(s)?

- Has greatly increased it
- Has somewhat increased it
- Has not impacted it
- Has somewhat decreased it
- Has greatly increased it

Please explain your answer:

9. How has your use and/or your child's teacher(s)' use of Storypark impacted your understanding of Ontario’s kindergarten curriculum?
• Has greatly increased it
• Has somewhat increased it
• Has not impacted it
• Has somewhat decreased it
• Has greatly increased it

Please explain your answer:

10. How often do you comment on the stories your child's teacher(s) post about your child's learning?

• All the time
• Very Often
• Sometimes
• Not very often
• Never

Please explain your answer:

11. How often do you post a story about your child's learning at home?

• All the time
• Very Often
• Sometimes
• Not very often
• Never

Please explain your answer:

12. How satisfied are you with your use and/or your child's teacher(s)' use of Storypark?

• Very Satisfied
• Somewhat satisfied

• Indifferent

• Somewhat dissatisfied

• Very dissatisfied

Please explain your answer:

13. What do you think would make your use and/or your child's teacher(s)' use of Storypark better?

• If my child's teacher(s) posted more/better individual stories about my child's learning

• If my child's teacher(s) posted more/better group stories about the learning of the entire class

• If my child's teacher(s) posted more/better images and/or videos

• If my child's teacher(s) posted more/better information about the daily activities of the classroom

• If my child's teacher(s) connected my child's learning with the Kindergarten curriculum more/better

• If I could communicate more/better with my child's teacher(s) about my child's learning in the classroom

• If I could communicate more/better with my child's teacher(s) about my child's learning at home
• If I could engage with the other parents in my child's classroom

• If my child was more involved in posting stories/commenting on stories about his/her own learning

• Nothing, I'm satisfied

• Other

Please explain your answer:

14. How do you think your use and/or your child's teacher(s)' use of Storypark has impacted your child?

• Positively
• Somewhat positively
• Neither positively nor negatively
• Somewhat negatively
• Negatively

Please explain your answer:

15. What do you think makes a good learning story? (i.e., post about your child’s learning).

16. What else would you like us to know about Storypark?
Appendix F

Interview Questions for Post-Intervention Interview with Educators
(adapted from Nirula, 2008)

1) Please describe the impact that introducing Storypark into your classroom has had upon a) yourself, (i.e.-teaching practices) b) your teaching partner or colleagues c) your students’ parents d) your students e) your school community?

2) At the early stages of this study, what were some of the concerns you had about introducing Storypark into your classroom? In what ways did you believe that Storypark would positively impact your classroom? Did any of these concerns or beliefs turn out to be true?

3) What did you like most about Storypark? What did you like least about Storypark?

4) How did introducing Storypark into your classroom impact your pedagogical documentation and assessment practices?

5) How did introducing Storypark into your classroom impact your understanding of the new Kindergarten curriculum?

6) How did introducing Storypark into your classroom impact your relationship to a) your teaching partner / colleagues b) your students’ parents c) your students?

7) How did introducing Storypark into your classroom impact your level of communication / engagement with your students’ parents / home environment?

8) What behavioural changes did you notice in a) yourself b) your teaching partner c) your students’ parents d) your students e) your school community as a result of introducing Storypark into your classroom?

9) How did you and/or your teaching partner incorporate Storypark into your daily, weekly, monthly teaching routines and practices?

10) How did introducing Storypark into your classroom impact your workload? Overall, did you feel it decreased/increased/had no impact on your workload?

11) Would you, as a Kindergarten educator, use Storypark next year? If so what improvements would you make?

12) If you were to use Storypark again, how would you introduce it to/use it with your students’ parents? How would you introduce it to/use it with your students?
Appendix G

Interview Questions for Post-Intervention Interview with Point Parents
(adapted from Nirula, 2008)

1) Tell me about how Storypark was used by your child’s Kindergarten educators.

2) Tell me about how you/other family members used Storypark.

3) What did you like most about Storypark? What did you like least about Storypark?

4) Do you feel that Storypark was a useful tool for your child’s Kindergarten educators? If yes, in what ways was it useful? If no, why wasn’t it useful?

5) Do you feel that Storypark was a useful tool for you as a parent? If yes, in what ways was it useful? If not, why wasn’t it useful?

6) How do you feel that Storypark impacted your child?

7) How did Storypark impact your understanding of your child’s learning and development?

8) How did Storypark impact your level of participation in your child’s learning at home? At school?

9) How did Storypark impact your level of engagement/communication with your child’s teachers? With your child’s school?

10) How did Storypark impact your understanding of the Ontario’s Kindergarten curriculum or play-based program?

11) Do you think your child’s Kindergarten educators should use Storypark next year? If so, what improvements should they make? If not, why not?

12) Would you, as a parent, use Storypark next year? If so, what improvement would you make? If not, why not?
Appendix H

Kindergarten Student Interview Questions

1) *What is Storypark?*

2) If child knows, ask, *How do you know about Storypark?* If child doesn’t know, explain what Storypark is.

3) *Would you like to read a few stories about some of the learning you have done in your classroom?*

4) If child says, NO to question #3, ask, *Why not?* Then end the interview.

5) If child says, YES to question #3, ask, *how do you think Storypark helps your learning?*

6) If child says, YES to question #3, ask, *how do you think Storypark helps your teachers?*

7) If child says, YES to question #3, ask, *how do you think Storypark helps your parents?*

8) *What do you think about Storypark?*
Appendix I

CWA Interview Questions for Kindergarten Educators

Adapted from Nirula (2009) – Protocol Reference #17598

WORK DOMAIN
1. Describe your role here in the school? Within the school board?
2. What are the two main goals you have for yourself here in your school?
3. What do you have to do to reach your goals?
4. What might get in the way of you reaching your goals?
5. What else can help you to reach your goals? (People or Resources)
6. How do you know when you’ve reached your goals?
7. If you were to write a “Mission Statement” relating to your goals, what would it say?

Environment:
1. What regulations/policies at the Ministry, Board or School levels affect how you do your job?
2. What specific policies influence you introducing a new technology into your classroom?
3. What physical aspects of the school (i.e.- the building, etc.) influence a) your ability to do your job b) your ability to introduce a new technology into your classroom?
4. Describe the available technology for Kindergarten educators? Students? Parents?

CONTROL TASKS
1. What do you need to do in order to utilize a new technology in your classroom?
2. What steps do need to take in order to introduce a new technology to students in your classroom? Parents?
3. What expectations do you have of yourself, team member, students and parents before they can start using a new technology in your classroom?

STRATEGIES
1. What are some of the possible strategies that teachers and ECEs can use to become proficient at using a new technology? Students? Parents?
2. Which of the above strategies do you use most often? Which of the above strategies do you think other educators use most often? Parents? Students?
3. Can you think of a time when you were a part of a new initiative in your school and it did NOT go well? Why do you think it did NOT work?
4. Can you think of a time when you were a part of a new initiative in your school and it did go well? How did you measure its’ success? To what do you attribute its success?
5. What strategies do you use to document your students’ learning? What strategies do you use to assess your students’ learning?
6. What strategies do you use to share your students’ learning with parents?

SOCIAL-ORGANIZATIONAL
1. Who do you depend on to help you with your responsibilities in your classroom?
2. Describe the various teams you work in? How do you usually decide on what responsibilities each person has when working within these teams?
3. How is the Kindergarten Program organized in the school? What specifically is your role in relation to the Kindergarten Program?
4. Describe how decisions in the school are usually made?
5. How is technology managed in your classroom? Who is in charge of making sure technology is working properly? Who is in charge of making sure technology is accessible to use by teachers and ECEs? Students? Parents?
6. What role do you see your classroom playing within the school? What role do you see your classroom playing within the community?

WORKER COMPETENCIES
1. What personal attributes or challenges do you have that make your job more difficult at times?
2. What personal attributes or skills do you have that make your job easier at times?
3. Describe your comfort level using technology.
4. In what ways do you use technology in your job? Daily life?
5. What personal challenges do you have that make using technology in your classroom more difficult for you?
6. What personal attributes or skills do you have that make using technology in your classroom easier for you?
7. What expectations do you have for this study? What impact do you think introducing a new technology will have upon you? Other Kindergarten teachers and ECEs? Students? Parents? The Kindergarten Program? The school?
Appendix J

CWA Interview Questions for Kindergarten Parents

Adapted from Nirula (2009) – Protocol Reference #17598

WORK DOMAIN
1. What two goals would you like your child to accomplish by the end of the school year?
2. What can you do to ensure that your child accomplishes those goals?
3. What do you think might get in the way of your child accomplishing those goals?
4. What or who else might help your child accomplish those goals? (People or Resources)
5. How would you know when your child has accomplished those goals?

Environment:
1. How do you think your child’s classroom environment affects his/her ability to learn?
2. What physical aspects of the school (i.e.- the building, etc.) do you think influence your child’s ability to learn?
3. What technology is available to your child in his/her classroom? What technology is available to his/her Kindergarten educators to communicate with parents? What technology is available to you to stay connected to your child’s learning in his/her classroom?

CONTROL TASKS
1. What do you need to do in order to stay connected to your child’s learning in his/her classroom?
2. What do you need do to support your child’s learning at school on a daily basis? Weekly? What do you need to support your child’s learning at home on a daily basis?
3. What do you need to do to incorporate a new technology into your daily life?

STRATEGIES
1. What are some of the possible strategies that Kindergarten teachers and ECEs use to communicate with parents about students’ learning? What are some of the possible strategies that parents use to communicate with their child’s Kindergarten teachers and ECE’s about their child’s learning? Which of the above strategies do you use/think are used most often?
2. What are some of the possible strategies that Kindergarten teachers and ECES use to communicate with parents about new initiatives happening at school? What are some of the possible strategies parents use to find out about new initiatives happening at school? Which of the above strategies do you use/think are used most often?
3. What are some of the possible strategies parents use to support their child’s classroom learning at home? Which of the above strategies do you use/think are used most often?
4. What are some of the possible strategies parents use to learn/incorporate a new technology into their daily lives? Which of the above strategies do you use/think are used most often?

SOCIAL-ORGANIZATIONAL
1. What role do you / other parents play in your child’s Kindergarten classroom? What role do you / other parents play in your child’s school?
2. What role do you play in supporting your child’s learning? What role does your partner play? What role does your child’s Kindergarten teacher and ECE play?
3. Who do you depend upon to help you support your child’s learning, development and behavior?

WORKER COMPETENCIES
1. What personal attributes or challenges do you have that make parenting your child more difficult at times?
2. What personal attributes or skills do you have that make parenting your child easier at times?
3. Describe your comfort level using technology.
4. In what ways do you use technology in your job? Daily life?
5. What personal challenges do you have that make using technology more difficult for you?
6. What personal attributes or skills do you have that make using technology easier for you?
7. What expectations do you have for this study? What impact do you think introducing a new technology will have upon you? Your child? Kindergarten teachers and ECEs? The Kindergarten Program? The school?
## Appendix K

Site A: Complete Human-tech Ladder (constraint vs. affordance analysis)

<table>
<thead>
<tr>
<th>Human-tech Category</th>
<th>Constraints</th>
<th>Affordances</th>
</tr>
</thead>
</table>
| **Physical**        | 1. Outdoor space needs improvement / lack of green space.  
2. Kindergarten wing is far away from the gym.  
3. There is no place to project in classrooms / educators have to create makeshift screens.  
4. Some classrooms are hot in summer / cold in winter.  
5. Norseman is growing school – lacks space.  
6. Technology is outdated/broken/always changing.  
7. Wi-Fi not strong /slow / intermittent.  
8. There are not enough I pads per room.  
9. Too many classrooms have to share technology - digital projector/smart board.  
10. Layout / colours are not conducive to program in some classrooms.  
11. There is a lack of windows /natural light in some classrooms. | 1. Classrooms have one I- pad.  
2. Teachers have a laptop.  
3. Educators have access to a document camera.  
4. Educators have access to a smart board.  
5. Educators have access to an “I pad cart” (for the whole school to use).  
6. Some classrooms are a nice size.  
7. Classrooms have nice learning materials.  
8. Classrooms are safe/clean/organized  
9. Kids have access to adventure playground for physical play.  
10. Kindergarten is in a separate space / is separated from the rest of the school.  
11. Most parents have access to smart phones, computers and the Internet. |
<p>| <strong>Psychological</strong>   | 1. Some educators are inexperienced / new | 1. Some educators are open-minded / |</p>
<table>
<thead>
<tr>
<th>1.</th>
<th>Some educators are unreflective.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Some educators have a good sense of humor.</td>
</tr>
<tr>
<td>3.</td>
<td>Some educators are positive / have a positive attitude.</td>
</tr>
<tr>
<td>4.</td>
<td>Some educators are creative.</td>
</tr>
<tr>
<td>5.</td>
<td>Some educators are experienced kindergarten educators.</td>
</tr>
<tr>
<td>6.</td>
<td>Some educators are “fast” / good at multi-tasking.</td>
</tr>
<tr>
<td>7.</td>
<td>Some educators are open to learning new tech / push themselves to learn new tech.</td>
</tr>
<tr>
<td>8.</td>
<td>Some educators feel very comfortable with tech / are “digital natives.”</td>
</tr>
<tr>
<td>9.</td>
<td>Some educators feel very comfortable with tech / are “digital natives.”</td>
</tr>
<tr>
<td>10.</td>
<td>Some educators have difficulty with multi-tasking / aren’t good at multi-tasking.</td>
</tr>
<tr>
<td>11.</td>
<td>Some educators worry about Internet safety / kids’ privacy.</td>
</tr>
<tr>
<td>12.</td>
<td>Some educators aren’t native speakers of English.</td>
</tr>
<tr>
<td>13.</td>
<td>Some educators have a temper / lack patience.</td>
</tr>
<tr>
<td>14.</td>
<td>Some parents have unrealistic expectations about children’s learning.</td>
</tr>
<tr>
<td>15.</td>
<td>Some parents are always looking for goals / are determined.</td>
</tr>
<tr>
<td>16.</td>
<td>Some parents have a temper / lack patience.</td>
</tr>
<tr>
<td>17.</td>
<td>Some parents have unrealistic expectations about children’s learning.</td>
</tr>
<tr>
<td>18.</td>
<td>Some parents are always looking for goals / are determined.</td>
</tr>
</tbody>
</table>
| Team | 1. Some teachers and ECEs aren’t “on the same page” re: teaching philosophy / teachers and ECEs teach differently in some classrooms.  
2. Some members of the kindergarten team aren’t supportive of one another.  
3. Some ECEs refuse to use / refuse to learn how to use the tech. | 1. Teachers and ECEs have same teaching philosophies in some classrooms.  
2. Teachers and ECEs have open communication in some classrooms.  
3. Kindergarten team discusses issues, shares ideas and collaborates.  
4. Some educators have online connections with other educators using same tech / in similar contexts. |

“stubborn to a fault.”
16. Some parents get frustrated when tech is slow or doesn’t work well.
17. Some parents have a personal dislike for tech / fear tech / worry about screen time / worry it creates a “false sense of community.”
18. Some parents are not fast learners with tech.
19. Some parents are older / mature.
20. Some parents are good role models for their kids.
21. Some parents are good with tech / are comfortable with tech.
22. Some parents are curious / are open / like to try new things.
same tech as their teacher partners.
4. In some classrooms, teachers make the decisions and don’t include input from ECEs.
5. In some teaching partnerships there is a lack of equality between the ECE and teacher.
6. Kindergarten team members don’t participate equally in team meetings.
7. In some classrooms educators don’t depend on anyone but themselves.
8. In some classrooms educators manage technology “haphazardly”.
9. Educators don’t communicate well / often with parents in some classrooms.
10. Some educators don’t have a parent volunteer schedule in their classrooms.
11. Some educators have to practice new tech / figure out it’s function / purpose before using it.
12. Some educators require formal training before using new tech.
13. Some educators have to work out a system with teaching partner before using new tech.
14. Some educators and parents communicate well / often / openly.
15. Educators use Twitter to communicate about what is going on in the classroom.
16. Some educators have parent reps in their classrooms.

5. Decisions on the kindergarten team are made equitably / democratically when possible.
6. Teachers include ECEs in decision-making process in some classrooms.
7. Educators take turns with responsibilities on the kindergarten team.
8. Some educators take opportunities to learn from other educators.
9. Some educators follow kids’ interests / get to know their students.
10. Some educators consult curriculum expectations to plan learning activities / assess student learning.
11. Some educators use notes / check lists to document/assess student learning.
12. Some educators use student work and portfolios to document/assess student learning.
13. Teachers and ECEs manage technology well in some classrooms.
14. Some educators and parents communicate well / often / openly.
15. Educators use Twitter to communicate about what is going on in the classroom.
16. Some educators have parent reps in their classrooms.
<table>
<thead>
<tr>
<th>14. Some educators “gradually release responsibility” over tech to kids (for fear of them breaking it / getting addicted to it / fighting over it).</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. Some educators wait until the end of the year to send student work home to parents.</td>
</tr>
<tr>
<td>16. Some educators have to inform parents about how new tech works / what it’s for before implementing it.</td>
</tr>
<tr>
<td>17. Some educators have to calm parents’ anxiety / manage their expectations about new tech before implementing it.</td>
</tr>
<tr>
<td>18. Some parents don’t follow through with learning activities from school at home.</td>
</tr>
<tr>
<td>19. Some parents don’t know what’s going on in the classroom (because of lack of communication from educators).</td>
</tr>
<tr>
<td>20. Some parents have “no idea” what kind of technology is available to their kids at school (because of lack of communication from educators).</td>
</tr>
<tr>
<td>21. Some parents don’t know what a typical kindergarten classrooms that volunteer to communicate information to other parents.</td>
</tr>
<tr>
<td>17. Some educators email parents on a regular basis to communicate/update parents about kids’ learning. Some educators reflect upon kids’ learning via their documentation.</td>
</tr>
<tr>
<td>18. Some educators plan activities based on observing/documenting kids’ interests.</td>
</tr>
<tr>
<td>19. Some educators use Google Classroom to communicate with parents about kids’ learning.</td>
</tr>
<tr>
<td>20. Some educators send newsletters/ monthly calendars home.</td>
</tr>
<tr>
<td>21. Some educators “jump in and play” in order to learn a new technology.</td>
</tr>
<tr>
<td>22. Some educators use trial and error to learn new tech.</td>
</tr>
<tr>
<td>23. Some educators learn a new technology by asking other educators / trying out one another’s methods.</td>
</tr>
<tr>
<td>24. Some educators show/talk / explain to kids how new tech works / what it is for etc.</td>
</tr>
<tr>
<td>25. Some educators talk to kids about how to talk about their learning.</td>
</tr>
<tr>
<td>26. Some educators talk to kids about how to talk to their parents about</td>
</tr>
<tr>
<td>Number</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>22.</td>
</tr>
<tr>
<td>23.</td>
</tr>
<tr>
<td>24.</td>
</tr>
<tr>
<td>25.</td>
</tr>
<tr>
<td>26.</td>
</tr>
<tr>
<td>27.</td>
</tr>
<tr>
<td>28.</td>
</tr>
<tr>
<td>29.</td>
</tr>
<tr>
<td>30.</td>
</tr>
<tr>
<td>31.</td>
</tr>
<tr>
<td>32.</td>
</tr>
<tr>
<td>33.</td>
</tr>
<tr>
<td>34.</td>
</tr>
<tr>
<td>35.</td>
</tr>
<tr>
<td>36.</td>
</tr>
<tr>
<td>37.</td>
</tr>
</tbody>
</table>
38. Some parents rely on the “triangular relationship” between children, parents and educators.
39. Some parents ask their kids “about their day.”
40. Some parents talk to kids about the importance of school.
41. Some parents attend field trips.
42. Some parents attend parent-teacher conferences / teacher night.
43. Parents receive feedback about kids’ learning through progress reports and report cards.
44. Some parents support / follow children’s personal interests at home.
45. Some parents require little / nothing to incorporate a new technology into their lives.
46. Some parents provide educators with feedback about their kids’ learning.
47. Some parents use a variety of tech at work and at home.

| Organizational | 1. School lacks an adequate tech budget to buy more tech / better tech. | 1. Admin / parent council raises money for new tech. |
|               | 2. School provides teachers with control over resource budget and not ECEs. | 2. Some educators feel kindergarten is a part of the school / is respected in the community. |
| 3. Some educators feel kindergarten is not a part of the school/community/is respected. |
| 4. School doesn’t provide educators with appropriate forms of assessment to assess kids’ learning. |
| 5. Educators lack release time to attend workshops/trainings. |
| 6. Educators’ time is taken up by administrative tasks. |
| 7. Some parents do not see/talk to their children’s educators because they drop off/pick up their kids from before and after care (due to their work hours/schedules). |
| 8. Some parents work late and lack time to support learning activities afterschool. |
| 9. Some parents have limited time to volunteer in classroom/have never seen classroom because of their work hours/schedules. |
| 10. Some kids spend long days at school and are in before and after care because of parents’ work hours/schedules. |
| 3. Each kindergarten classroom gets a resource budget every year. |
| 4. The kindergarten program is seen as foundational to kids’ learning/beginning of their school experience. |
| 5. Some parents work hours/schedules allow them to talk to educators at drop off and pick up on a daily basis. |
| 6. Some parents work hours/schedules allow them to volunteer in the classroom/attend fieldtrips. |
| 7. School acts as a community “hub” for families. |
| 8. Principal is open to educators’ use of tech. |
| 9. Kindergarten chair serves as liaison to principal/admin. |
| 10. Principal is supportive of staff. |
| 11. Principal asks for input from educators before making decisions. |
| 12. Some parents are engaged with the school environment/attend school functions/make donations etc. |
| 13. Principal no longer requires kindergarten
14. Parent council is active at the school.

<table>
<thead>
<tr>
<th>Political</th>
<th>1. M of E’s policy on class size cap is too high.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. The school board doesn’t allow prep time to ECEs to plan with teacher.</td>
</tr>
<tr>
<td></td>
<td>3. Educators are supposed to have a “flow of day” but the school system requires kids to transition to other activities so teachers can have prep time.</td>
</tr>
<tr>
<td></td>
<td>4. M of E requires educators to follow a certain curriculum.</td>
</tr>
<tr>
<td></td>
<td>5. The school board requires parents to get a police check to volunteer in their children’s classroom.</td>
</tr>
<tr>
<td></td>
<td>6. The school board didn’t provided adequate training on the new curriculum/report card</td>
</tr>
<tr>
<td></td>
<td>7. The school board’s health/safety policies dictate what</td>
</tr>
<tr>
<td></td>
<td>1. The school board has changed policy to include ECEs names on report cards / allow ECES to write report cards with teachers.</td>
</tr>
<tr>
<td></td>
<td>2. The school board has changed policy to allow ECES to attend parent-teacher night (get paid to attend).</td>
</tr>
<tr>
<td></td>
<td>3. M of E’s new report card is more in line with FDK play-learning program.</td>
</tr>
<tr>
<td></td>
<td>4. M of E’s curriculum is play-based.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>educators can/can’t do and are different from the daycare’s policies.</td>
<td>8. The school board’s confidentiality privacy policies prevent educators from sharing certain information with parents.</td>
</tr>
<tr>
<td></td>
<td>9. The school board’s policies are unclear re: personal device use.</td>
</tr>
<tr>
<td></td>
<td>10. The school board must approve tech before schools / teachers can use it.</td>
</tr>
<tr>
<td></td>
<td>11. M of E has not defined the role or expectations of ECE / teacher well.</td>
</tr>
<tr>
<td></td>
<td>12. The school board is short-sighted” and “reactionary” in how they make their policies.</td>
</tr>
<tr>
<td></td>
<td>13. Class sizes are unequal across the school board.</td>
</tr>
<tr>
<td></td>
<td>14. The school board’s policy on ECE hours limits ECEs from interacting with parents.</td>
</tr>
<tr>
<td></td>
<td>15. The school board</td>
</tr>
</tbody>
</table>
requires school to print off certain communications.

16. M of E’s other curricula are out of step with FDK.

<table>
<thead>
<tr>
<th>Category</th>
<th># of Constraints</th>
<th># of Affordances</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>-11</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Psychological</td>
<td>-18</td>
<td>22</td>
<td>4</td>
</tr>
<tr>
<td>Team</td>
<td>-25</td>
<td>47</td>
<td>22</td>
</tr>
<tr>
<td>Organizational</td>
<td>-10</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>Political</td>
<td>-16</td>
<td>4</td>
<td>-12</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>-80</strong></td>
<td><strong>98</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>
## Appendix L

Site B: Complete Human-tech Ladder (constraint vs. affordance analysis)

<table>
<thead>
<tr>
<th>Human-tech category</th>
<th>Constraint</th>
<th>Affordance</th>
</tr>
</thead>
</table>
| Physical            | 1. Classroom size is too small for amount of kids.  
                     | 2. Playground is small.  
                     | 3. Lack of resources for larger groups of kids (not enough of stuff for big classes).  
                     | 4. Not enough outlets.  
                     | 5. Lack of I pads for kids.  
                     | 6. Tech is outdated.  
                     | 7. Lack of drops.  
                     | 8. Open-concept school (lack of doors makes it loud).  
                     | 9. Extension cords can’t be used. | 1. Big windows create lots of natural light.  
                                                   | 2. Classrooms are nice, clean, and safe.  
                                                   | 3. Classrooms have high-quality materials.  
                                                   | 4. Classrooms have easy access to gym, math room, library, and playground.  
                                                   | 5. Educators have access to I pads (2 per class)  
                                                   | 6. Educators have access to a PC (1 per class)  
                                                   | 7. Educators have access to a document camera.  
                                                   | 8. Educators have access to an overhead projector.  
                                                   | 9. Kids have their own cubbies to put their stuff in.  
                                                   | 10. Classrooms are organized into centres.  
                                                   | 11. Most parents have access to technology. |
| Psychological       | 1. Some educators are sensitive to criticism from others.  
                     | 2. Some educators are new to kindergarten / lack experience.  
                     | 3. Some educators aren’t good at managing time.  
                     | 4. Some educators are disorganized.  
                     | 5. Some educators are self-critical.  
                     | 6. Some educators are impatient in learning new | 1. Some educators are easy going.  
                                                   | 2. Some educators are patient.  
                                                   | 3. Some educators are interested in developmental psychology.  
                                                   | 4. Some educators are knowledgeable / experienced kindergarten educators.  
                                                   | 5. Some educators are organized.  
<pre><code>                                               | 6. Some educators are not shy to |
</code></pre>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>Some educators become “paralyzed” / “overwhelmed” when learning new tech.</td>
</tr>
<tr>
<td>8.</td>
<td>Some educators lack knowledge / don’t understand function or purpose behind new tech.</td>
</tr>
<tr>
<td>9.</td>
<td>Some educators have to feel comfortable before using new tech.</td>
</tr>
<tr>
<td>10.</td>
<td>Some educators are stressed about keeping their position at the school</td>
</tr>
<tr>
<td>11.</td>
<td>Some parents are introverted / find it difficult to communicate with educators / other parents about kids.</td>
</tr>
<tr>
<td>12.</td>
<td>Some parents feel they lack parenting knowledge (“never fully prepared to be a parent”).</td>
</tr>
<tr>
<td>13.</td>
<td>Some parents can be too strict.</td>
</tr>
<tr>
<td>14.</td>
<td>Some parents are impatient.</td>
</tr>
<tr>
<td>15.</td>
<td>Some parents don’t push their kids enough to do certain things / aren’t firm</td>
</tr>
<tr>
<td></td>
<td>learn new tech.</td>
</tr>
<tr>
<td>7.</td>
<td>Some educators are good at identifying the help that they need.</td>
</tr>
<tr>
<td>8.</td>
<td>Some educators think learning new tech is important/value learning new tech.</td>
</tr>
<tr>
<td>9.</td>
<td>Some parents are very patient.</td>
</tr>
<tr>
<td>10.</td>
<td>Some parents are laid back / relaxed / flexible.</td>
</tr>
<tr>
<td>11.</td>
<td>Some parents are knowledgeable / have background in child development.</td>
</tr>
<tr>
<td>12.</td>
<td>Some parents are very comfortable with tech.</td>
</tr>
<tr>
<td>13.</td>
<td>Some parents are very open / eager to receive information about their kids through new tech.</td>
</tr>
</tbody>
</table>
| Team | 1. Educators in teaching partnerships have different philosophies / teach differently in some classrooms.  
2. Some educators aren’t willing to collaborate with other educators to learn new technology.  
3. Some educators avoid tech in the classroom / have taken tech out / don’t manage tech.  
4. Educators don’t communicate with parents often / regularly in some classrooms / rely on-face to-face communication / paper-based communication.  
5. Some educators need to adapt old methods to new tech / figure out how to make it equitable before using new tech.  
6. Some educators need formal training to fully understand purpose and function of new tech before using it. |
|---|---|
| | 1. Early years leader provides leadership on kindergarten team.  
2. Some educators depend on other educators for help with classroom responsibilities.  
3. Educators meet regularly as a Kindergarten team to discuss ideas / share / collaborate.  
4. Teachers and ECEs depend upon each other to manage classroom responsibilities in some classrooms.  
5. Some educators host student teachers to provide “an extra pair of hands.”  
6. Some educators take AQ course to increase knowledge / skills re: how to teach kindergarten / to understand child development.  
7. Some educators talk to parents when they drop off / pick up / through face-to-face communication to support their children’s learning.  
8. Some educators send kids’ work home / send student portfolios home to parents.  
9. Some educators send newsletters home to parents on a monthly basis.  
10. Educators and parents meet one to two times per year at parent-teacher conferences.  
12. Some educators ensure pictures are informative when they send them out to parents. |
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>Some educators need to “teach” students new</td>
</tr>
<tr>
<td>8.</td>
<td>Some educators need to provide visual cues / break tech down into small steps / provide students with step-by-step instructions.</td>
</tr>
<tr>
<td>9.</td>
<td>Some educators need to send out a newsletter / email to parents before implementing new tech re: boundaries for parents around new tech use / purpose and function behind new tech.</td>
</tr>
<tr>
<td>10.</td>
<td>Some educators need to research new tech on Google / follow instructions online when learning new tech.</td>
</tr>
<tr>
<td>11.</td>
<td>Educators don’t use a lot of tech at home / at school.</td>
</tr>
<tr>
<td>12.</td>
<td>Some parents find it difficult to talk to their kids about their day.</td>
</tr>
<tr>
<td>13.</td>
<td>Some parents don’t know what is going on in the classroom / have no idea what kids are learning</td>
</tr>
<tr>
<td>14.</td>
<td>Some educators follow kids interests / ask questions to maintain their interests.</td>
</tr>
<tr>
<td>15.</td>
<td>Some educators plan activities according to kids’ interests.</td>
</tr>
<tr>
<td>16.</td>
<td>Some educators reflect on what they have done/ where they need to go in the curriculum.</td>
</tr>
<tr>
<td>17.</td>
<td>Some educators assess student progress from beginning of the year until the end of the year.</td>
</tr>
<tr>
<td>18.</td>
<td>Some educators document kids’ learning through observation / mental notes.</td>
</tr>
<tr>
<td>20.</td>
<td>Some parents talk to kids about their days.</td>
</tr>
<tr>
<td>21.</td>
<td>Some parents provide kids opportunities for creativity and expression at home.</td>
</tr>
<tr>
<td>22.</td>
<td>Some parents read to their kids at home.</td>
</tr>
<tr>
<td>23.</td>
<td>Some parents provide kids with emotional support at home / get them in a positive mood for school.</td>
</tr>
<tr>
<td>24.</td>
<td>Some parents ensure kids’ physical needs are met, (fed, well-rested, warm).</td>
</tr>
<tr>
<td>25.</td>
<td>Some parents figure out what kids are learning at school and find ways to extend kids’ learning at home.</td>
</tr>
<tr>
<td>26.</td>
<td>Some parents try not to rush kids when they are home / allow them to rest / relax.</td>
</tr>
</tbody>
</table>
| 27. | Some parents go on field
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>about at school (due to lack of communication with educators).</td>
<td>trips / nature walks with kids.</td>
<td></td>
</tr>
<tr>
<td>14. Some parents don’t know what tech is available to their kids in the classroom (because of lack of communication with educators).</td>
<td>28. Some parents depend on educators to support kids’ learning.</td>
<td></td>
</tr>
<tr>
<td>29. Some parents don’t require help from educators to learn new tech.</td>
<td>30. Some parents use a variety of different tech in their jobs and at home.</td>
<td></td>
</tr>
<tr>
<td><strong>Organizational</strong></td>
<td><strong>Kindergarten is regarded as the foundation for kids learning at the school.</strong></td>
<td></td>
</tr>
<tr>
<td>1. Educators spend too much time on paper work.</td>
<td>2. Kindergarten serves as parents’ first connection to a wider community at the school.</td>
<td></td>
</tr>
<tr>
<td>2. Teachers don’t always have an ECE / are on their own in a classroom of 15 students.</td>
<td>3. Some parents’ work hours / schedules allow them to talk to their kids’ educators at drop off and pick up on a daily basis.</td>
<td></td>
</tr>
<tr>
<td>3. Educators are pressured by admin to get students ready for grade one/ EQAO.</td>
<td>4. Some parents’ work hours/schedules allow them to volunteer in the classroom / attend fieldtrips.</td>
<td></td>
</tr>
<tr>
<td>4. There is a small budget for tech at the school.</td>
<td>5. School has a not-for-profit daycare.</td>
<td></td>
</tr>
<tr>
<td>5. Some parents don’t see / talk to their children’s educators because they drop off / pick up their kids from before and after care due to their work hours/schedules.</td>
<td>6. School has a website / blog / emails that parents read.</td>
<td></td>
</tr>
<tr>
<td>6. Some parents work late and lack time to support kids’</td>
<td>7. Principal encourages educators to purchase resources.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Admin steps in when educators need help.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9. Some parents participate in school council / school council is active at the school.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10. Principal helps manage tech/ensure it’s accessible.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11. Librarian helps manage tech/ensure it’s accessible.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>learning activities afterschool.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Some parents have limited time to volunteer in the classroom because of their work hours/schedules.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Some parents aren’t able to see their child’s classroom because of their work hours / schedules.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Some children spend long days at school and in before and after care because of parents’ work hours / schedules</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Principal requires some communication between educators and parents to be vetted.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Decisions at the school are made hierarchically / top down.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Decisions at the school are made without a lot of planning / input from the staff.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Admin / other educators at the school don’t value / understand the new curriculum</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Political | 1. The school board does not give ECEs planning time.  
2. The Ministry of Education’s policy on the number of students in each classroom is too large / student-to-educator ratio is not conducive to learning.  
3. The school board’s hiring policies prevent educators from having input into whom they teach with.  
4. The school board did not provide adequate training on new curriculum/report card.  
5. ECEs and teachers are a part of different unions / have different work contracts.  
6. School was in | 1. The M of E’s new report card and new curriculum are in line with play-based learning. |
the last phase of FDK roll out at the school board.

7. The school board’s health and safety policies dictate educators’ teaching practices and differ from the daycare.

8. Ministry of Educations does not require ECEs and teachers to have same background in their education and training.

9. There are ambiguous policies around personal device use.

10. Ministry of Education removed educational assistants from the classroom.

11. The school board must approve tech before educators can use it.

12. The school board’s policies related to confidentiality limit educators’ communication with parents.

13. The school
board’s requirement for police check prevents parents from volunteering in the classroom.

14. The school board got rid of old email system and replaced it with a more confusing one.

15. Ministry of Education’s policy around the full day was not well thought out in terms of space management.

<table>
<thead>
<tr>
<th>Category</th>
<th># of Constraints</th>
<th># of Affordances</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>-9</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Psychological</td>
<td>-15</td>
<td>13</td>
<td>-2</td>
</tr>
<tr>
<td>Team</td>
<td>-14</td>
<td>30</td>
<td>16</td>
</tr>
<tr>
<td>Organizational</td>
<td>-15</td>
<td>11</td>
<td>-4</td>
</tr>
<tr>
<td>Political</td>
<td>-15</td>
<td>1</td>
<td>-14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>-68</strong></td>
<td><strong>66</strong></td>
<td><strong>-2</strong></td>
</tr>
</tbody>
</table>
### Appendix M

Site C: Complete Human-tech Ladder (constraints vs. affordances analysis)

<table>
<thead>
<tr>
<th>Human-tech Category</th>
<th>Constraint</th>
<th>Affordance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>1. Classroom size is too small for amount of kids (was originally built for 20 kids). Too small for inquiry.</td>
<td>1. Kids have access to nice grounds / outdoor space.</td>
</tr>
<tr>
<td></td>
<td>2. Patchy Wi-Fi.</td>
<td>2. Classroom space works well for a half class of 15 students.</td>
</tr>
<tr>
<td></td>
<td>3. Not enough tech is available / ECEs have to share tech with other classrooms.</td>
<td>3. Every kindergarten classroom but one has a smart board.</td>
</tr>
<tr>
<td></td>
<td>4. Classroom layout limits what activities educators can plan.</td>
<td>4. Educators have access to one iPad in each classroom.</td>
</tr>
<tr>
<td></td>
<td>5. Tech requires constant upkeep / is old and outdated.</td>
<td>5. Kids have access to a variety of books / resources/ learning materials.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Parents have access to technology at home.</td>
</tr>
<tr>
<td>Psychological</td>
<td>1. Some educators are new to kindergarten / are inexperienced.</td>
<td>1. Some educators have good instincts / can “think on their feet.”</td>
</tr>
<tr>
<td></td>
<td>2. Some educators aren’t organized.</td>
<td>2. Some educators are reflective.</td>
</tr>
<tr>
<td></td>
<td>3. Some educators aren’t good at planning.</td>
<td>3. Some educators are very structured / like routine /like to plan.</td>
</tr>
<tr>
<td></td>
<td>4. Some educators are self-critical.</td>
<td>4. Some educators are patient and kind</td>
</tr>
<tr>
<td></td>
<td>5. Some educators are easily frustrated / lack patience.</td>
<td>5. Some educators are willing to learn / open-minded to learning new tech.</td>
</tr>
<tr>
<td></td>
<td>6. Some educators are busy / struggle to balance demands of work/home.</td>
<td>6. Some educators are very comfortable with tech.</td>
</tr>
<tr>
<td></td>
<td>7. English is a second language for some educators.</td>
<td>7. Some parents are patient/ understanding/ encouraging.</td>
</tr>
<tr>
<td></td>
<td>8. Some educators feel stress over getting kids reading and writing.</td>
<td>8. Some parents are self-reflective / always thinking about what they could improve upon.</td>
</tr>
</tbody>
</table>
|   | 1. Some educators don’t use any tech in their classrooms.  
|   | 2. Some educators don’t email parents / use paper communication / letters home get lost.  
|   | 3. Some educators aren’t as effective / efficient at documenting kids’ learning as they would like to be.  
|   | 4. Some educators rely on others to learn new tech / need to be shown how to use new tech.  
|   | 5. Some educators require professional development workshops to learn new tech.  
|   | 6. Some educators need to learn what new tech is capable of before using it / need to inform themselves about it before using it.  
|   | 7. Some educators need to get to know their class before they introduce new tech to them.  
|   | 8. Some educators need to introduce new tech slowly to kids / show them a few aspects at a time.  
|   | 9. Some educators need to present new tech to parents at parent-teacher conferences. | 1. Some educators prioritize improving their documentation practices via technology as well as sharing these practices with their ECE.  
|   | 2. Some educators prioritize improving their inquiry-based teaching.  
|   | 3. All educators meet regularly as a kindergarten team to discuss / share ideas and collaborate.  
|   | 4. All educators meet regularly with another kindergarten team at an adjoining school to discuss / share ideas and collaborate.  
|   | 5. Some educators have an “open door” policy for parents to drop by anytime.  
|   | 6. Educators discuss issues and make decisions as a kindergarten team.  
|   | 7. Teachers and ECEs depend on one another for support with responsibilities in some classrooms.  
|   | 8. Educators volunteer to take on responsibilities based on preferences / interests / skills / strengths on the kindergarten team.  
|   | 9. Educators share student learning with parents through report cards / progress reports. |
10. Some educators don’t use any tech at work or at home.
11. Some parents cannot talk to their kids about their days.
12. Some parents don’t play a role in the classroom.
13. Some parents don’t know what’s happening / have no idea what’s happening in the classroom (because of the lack of communication with educators).
14. Some parents don’t have email addresses and require physical copies of communication.
15. Some parents don’t know what tech is being used in the classroom (because of lack of communication with educators).
16. Some parents don’t know/get enough information from the teacher to know how their children are progressing.

| 10. Educators meet with parents at parent-teacher conferences / teacher night. | 11. Some educators provide activity bags for parents to do with their kids at home. |
| 12. Some educators use pedagogical documentation apps to capture learning and share with parents. | 13. Some educators observe children, notice their interests and plan accordingly. |
| 14. Some educators “just play” around with new tech to learn how to use it / immerse themselves in it | 15. Some educators talk with more proficient colleagues to learn about how to use new tech. |
| 16. Some educators take professional development opportunities whenever they are offered. | 17. Some educators prepare kids to talk to their parents about learning stories on tech. |
| 18. Some educators provide inquiry-based learning activities in classroom. | 19. Some educators send out a monthly newsletter / calendar. |
| 20. Some teachers manage tech well in classrooms / fix it if it’s broken / ensure it’s accessible to students. | 21. Some educators use kids’ work / student portfolio to document and assess learning. |
| 22. Some educators write down notes about how learning is |
24. Some educators share student learning through slide show at parent-teacher conferences.
25. Some educators use/rely on tech for everything.
26. Some parents use a variety of tech at home and at work.
27. Some parents check in with kids’ teachers on a regular basis/communicate regularly.
28. Some parents talk to kids about their days/ask questions/appear curious about their learning.
29. Some parents provide kids with emotional support at home/get them in a positive mood for school/provide positive encouragement.
30. Some parents make an effort to know what kids are learning about on a daily basis and then reinforce that at home.
31. Some parents and educators communicate through email and phone when need be.
32. Some parents go on field trips/nature walks with kids.
33. Some parents volunteer in the classroom.
34. Some parents depend on educators to support their kids’ learning.
| Organizational | 1. Educators spend too much time dealing with unexpected factors that come up throughout the day.  
2. School does not provide educators release time to collaborate / learn new initiatives.  
3. There’s a small budget for tech  
4. Some kindergarten classrooms are “too new” to have a role at the school.  
5. Some parents’ don’t see / talk to their kids’ educators because they drop off / pick up from before and after care (due to their work hours/schedules).  
6. Some parents work late and lack time to support learning activities afterschool.  
7. Some parents can’t volunteer in the classroom / have limited time to volunteer because of their work hours / work schedules.  
8. Admin has to put new tech on devices before educators can use it.  
9. It takes a long time for the school to fix broken tech.  
10. Communication about school initiatives is paper-based. | 1. Kindergarten is regarded as the foundation / beginning of kids learning at the school.  
2. Principal is open to educators using the tech that they want to use.  
3. Principal is trusting of educators / “lets them do their jobs”  
4. Some parents’ work hours / schedules allow them to talk to educators at drop off and pick up on a daily basis.  
5. Active parent council  
6. Educators depend on admin for support.  
7. Principal asks for input from educators before making decisions.  
8. School provides literacy, numeracy and kindergarten coaches.  
9. An “unofficial leader” on kindergarten team liaises with principal on behalf of kindergarten team.  
10. Parents text each other to communicate about new initiatives in the school. |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Political</td>
<td>1. The school board doesn’t allow ECEs prep time / ECEs lack</td>
</tr>
</tbody>
</table>
2. Ministry of Education’s student cap is too high / teacher-to-child ratio isn’t conducive to inquiry-based learning.
3. Regulations related to the childcare aspects of the job impact kindergarten educators’ teaching practices.
4. The school board did not provide adequate training on new report card/new curriculum.
5. The school board has banned specific tech / doesn’t allow educators to use certain tech.
6. The school board’s policies are unclear re: educators’ use of personal devices for work purposes.
7. The school board is risk averse /afraid of taking on new things / worried about parental response.

### Site C: Summary of constraints vs. affordances

<table>
<thead>
<tr>
<th>Category</th>
<th># of Constraints</th>
<th># Affordances</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>-5</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Psychological</td>
<td>-10</td>
<td>9</td>
<td>-1</td>
</tr>
<tr>
<td>Team</td>
<td>-16</td>
<td>35</td>
<td>19</td>
</tr>
<tr>
<td>Organizational</td>
<td>-10</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Political</td>
<td>-7</td>
<td>1</td>
<td>-6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>-48</strong></td>
<td><strong>61</strong></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>
Appendix N

Site D: Complete Human-tech Ladder (constraint vs. affordance analysis)

<table>
<thead>
<tr>
<th>Human-tech Category</th>
<th>Constraint</th>
<th>Affordance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>1. Location of the room (is far from lunch and playground)</td>
<td>1. Kids have access to nice playground with nice structure.</td>
</tr>
<tr>
<td></td>
<td>2. The location of outlets makes them difficult to use.</td>
<td>2. Classrooms have smart boards.</td>
</tr>
<tr>
<td></td>
<td>3. Wi-Fi is patchy</td>
<td>3. Educators have access to one Ipad per classroom.</td>
</tr>
<tr>
<td></td>
<td>4. Limited drops</td>
<td>4. Kids have access to a desktop computer.</td>
</tr>
<tr>
<td></td>
<td>5. Each classroom has to share 10 Ipads with the rest of the school.</td>
<td>5. Educators have access to set of Chrome Books.</td>
</tr>
<tr>
<td></td>
<td>6. Building is old.</td>
<td>6. Educators have access to 10 Ipads for kids to use (share with the whole school).</td>
</tr>
<tr>
<td></td>
<td>7. Some Laptops are old</td>
<td>7. Classrooms have lots of natural light.</td>
</tr>
<tr>
<td></td>
<td>8. Some educators want more science books.</td>
<td>8. Classrooms are clean, safe and organized / easy to navigate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Classrooms are large.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. Parents have access to technology / Internet.</td>
</tr>
<tr>
<td>Psychological</td>
<td>1. Some educators are perfectionists.</td>
<td>1. Some educators are very sociable / team players.</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>2. Some educators are tired from long commute.</td>
<td>2. Some educators have lots of experience.</td>
</tr>
<tr>
<td></td>
<td>3. Some educators aren’t very comfortable with tech.</td>
<td>3. Some educators have a good understanding of child development.</td>
</tr>
<tr>
<td></td>
<td>4. Some parents have inappropriate expectations (not age-appropriate) for their kids’ levels of development / learning.</td>
<td>4. Some educators are eager to learn how to use PDT more effectively.</td>
</tr>
<tr>
<td></td>
<td>5. Some parents lack patience.</td>
<td>5. Some educators are very comfortable with tech / fast learners / not afraid to jump in.</td>
</tr>
<tr>
<td></td>
<td>6. Some parents are too rushed</td>
<td>6. Some parents are organized.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Some parents are fairly laid back / don’t feel the need to micro-manage kids in school environment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Some parents aren’t afraid to use new tech / are very comfortable using new tech.</td>
</tr>
</tbody>
</table>
| Team | 1. Some parents leave “academic stuff to the school” / aren’t so involved in academic learning.  
2. Some parents have a hard time talking to their kids about what’s going on in the classroom.  
3. Some parents don’t know what their children are learning about in the classroom (because of lack of communication from educators).  
4. Some educators still refer to curriculum document because they don’t know it well enough yet.  
5. Some educators don’t know how to use tech themselves / depend on other educators to do it for them.  
6. Some educators need a “lunch and learn” / workshop to learn how to use new tech. | 1. Some educators use parents to help them with their responsibilities in the classroom.  
2. All educators meet regularly as a kindergarten team to discuss issues / share ideas / collaborate.  
3. All educators meet regularly with another kindergarten team at an adjoining school to discuss issues / share ideas / collaborate.  
4. Educators discuss issues and make decisions democratically as a team.  
5. Teachers and ECEs depend on each other to help them with their responsibilities in some classrooms.  
6. Educators share student learning with parents through report cards / progress reports.  
7. Some educators use Twitter to communicate with parents.  
8. Educators meet with parents at parent-teacher conferences / teacher night.  
9. Educators talk to some parents at drop off and pick up / have face-to-face contact.  
10. Some educators email parents to communicate.  
11. Teachers manage tech well in some classrooms / make sure it works properly.  
12. Some educators use new tech with students in classrooms.  
13. Some educators attend professional development workshops / educate |
themselves.

14. Some educators connect with other educators over FB / other online groups for support.

15. Some educators reflect on kids’ learning and development daily / weekly / monthly.


17. Some educators informally and formally assess kids’ learning to determine growth/progress.

18. Some educators use curriculum document to plan activities for kids.

19. Some educators use apps to document / share student learning.

20. Some educators use student work / portfolios to document and assess student learning.

21. Some educators use photos to document student learning.

22. Some educators send student work home to share student learning with parents.

23. Some educators use tech at work and at home for a variety of purposes.

24. Some educators play with new tech to learn it.

25. Some educators share ideas with each other / collaborate to learn new tech.

26. Some parents support literacy efforts of kids outside of school.

27. Some parents depend on
<table>
<thead>
<tr>
<th>Organizational</th>
<th>1. Educators spend too much time dealing with unexpected factors that come up throughout the day at the school.</th>
<th>1. Kindergarten is regarded as the foundation for kids learning at the school.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Educators spend</td>
<td>2. Principal is open to educators using what they want to use.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Parental involvement is very high at the school.</td>
</tr>
</tbody>
</table>

educators to support them with teaching their kids / communicate with educators to see how their children’s are doing.
28. Some parents have a classroom FB group to communicate with each other.
29. Some classrooms have a class rep that communicates with other parents, sends out emails etc.
30. Some parents try to extend their children’s learning from school to home.
31. Some parents use new tech at home and at work for a variety of purposes.
<table>
<thead>
<tr>
<th>Political</th>
<th>1. The school board must approve tech before educators can use it (new security measures were put in).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. The school board is strict about social media / being in contact with parents</td>
</tr>
<tr>
<td>2. The school board provides a centrally located IT HELP desk for educators to use when they need help with tech.</td>
<td></td>
</tr>
<tr>
<td>3. New reporting procedures now more specific to child / more flexible / more aligned with kindergarten program.</td>
<td></td>
</tr>
<tr>
<td>4. Board provides workshops and resources to educators.</td>
<td></td>
</tr>
</tbody>
</table>

| 1. The school board must approve tech before educators can use it (new security measures were put in). |
| 2. The school board is strict about social media / being in contact with parents |
| 3. New reporting procedures now more specific to child / more flexible / more aligned with kindergarten program. |
| 4. Board provides workshops and resources to educators. |

3. Some parents work late and lack time to support learning activities after school.
4. Some parents have limited time to volunteer in the classroom because of their work.
5. Some parents cannot talk to their kids’ teachers face-to-face (because of work schedules).
6. Admin has to put apps on tech before educators can use them.
7. Parent association and school have separate websites (not integrated).
8. Educators depend on admin to help them with their responsibilities.
9. Principal asks for input from educators before making decisions particularly with regards to tech.
10. Some parents’ work schedules allow them to talk to educators at drop off and pick up on a daily basis.
11. Some parents’ work hours/schedules allow them to volunteer in the classroom / attend fieldtrips.
12. Educators no longer have to submit an LRP because it is inconsistent with emergent learning.
13. Student body does not have a catchment / students come from all over the city b/c of lottery system, which creates more committed community of families.
14. Parents’ association makes a lot of the decisions at the school / determines policy.
3. The school board didn’t provide proper training on new curriculum/new report card.
4. School board doesn’t provide prep time for ECEs.
5. The school board doesn’t ask for feedback from frontline users, just goes with cheapest suppliers of tech.

<table>
<thead>
<tr>
<th>Category</th>
<th># of Constraints</th>
<th># of Affordances</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>-8</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Psychological</td>
<td>-6</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Team</td>
<td>-6</td>
<td>31</td>
<td>25</td>
</tr>
<tr>
<td>Organizational</td>
<td>-7</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Political</td>
<td>-5</td>
<td>3</td>
<td>-2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>-32</strong></td>
<td><strong>62</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>