



Waterford Upstart: A Targeted Support to Combat COVID Learning Loss

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Table of Contents

Introduction.....4

COVID-19 and Learning Loss.....4

What is Waterford Upstart?6

Waterford Upstart Summer Learning Path7

Conclusion11

Bibliography.....13

Last summer, Waterford.org supporters asked if there was a way for Waterford Upstart, an in-home, technology-delivered school readiness program, to be used to mitigate the learning loss caused by the pandemic. Waterford Upstart moved quickly to put together a Summer Learning Path program that was based on the year-long program but abbreviated for the circumstances. The results were outstanding. This paper describes the research and results and puts forward an option to prepare children for kindergarten and school success, either during the second half of the school year or as a summer program, for children who are continuing to have their education interrupted or whose parents are choosing to keep their children home in light of the pandemic.

Introduction

In March 2020, education suffered a substantial shock—schools across the country closed their doors in response to the COVID-19 pandemic. For K–12, this meant that 50 million of the nation’s 57 million students—nearly 88 percent—were out of school until the fall (Map: Coronavirus and School Closures). The impact of school closures was even greater for preschool students. In their survey, Barnett and Jung (2020) found that preschool participation fell from 61 percent of three- to five-year-olds not yet enrolled in kindergarten to just 8 percent. They note that this was due to a combination of two factors: (1) programs closed altogether for 74 percent of children enrolled, including 90 percent of the nation’s Head Start centers, and (2) attendance ended voluntarily for 45 percent of children whose programs remained open. These closures caused students to lose two to four months of learning, in addition to the normal break, which is likely to have significant long-term impact.

While it is impossible to know the precise learning losses that nation-wide school closures will cause, decades of research on summer slide, natural disaster- and weather-induced school closures, and absenteeism is helping researchers to estimate the magnitude of the “COVID slide.” Three overarching trends are consistent across this research: (1) achievement tends to slow down or decline when students are out of school for extended periods, (2) the (proportional) extent of loss increases with grade level, and (3) losses tend to be greater for math than for reading. Therefore, it is more important than ever to ensure our youngest, most vulnerable learners enter school ready to learn. Waterford Upstart, an in-home, technology delivered school readiness program, has demonstrated through rigorous research over multiple years that it can provide such support. Additionally, Waterford Upstart has proven successful this year as a targeted response that reduces the potential impact of COVID slide.

COVID-19 and Learning Loss

The most studied period of learning loss is “summer slide,” or the loss of skills experienced by students during the time period between two school years when they are out of the classroom (Cooper, et al. 1996). Though there is debate about the magnitude of learning loss during the summer (von Hippel 2019), research consistently shows that loss occurs (Cooper, et al., 1996; Alexander, Entwisle, & Olson, 2001; Quinn & Polikoff, 2017). Indeed, these studies indicate that students lose one to two months of learning during summer break, with students from low-income households experiencing greater losses than their middle- and high-income peers (Cooper, et al., 1996; Alexander, Entwisle, & Olson, 2001). Based on data from the MAP Growth assessment, Kuhfeld (2018) estimates that during a typical summer, students lose 20 to 50 percent of their school year gains in reading and math.

Multiple studies have also considered the impacts of weather-related school closures. Hansen (2011), for example, found that 8th grade math achievement was reduced by 0.013 to 0.039 standard deviations for each snow day in Colorado and by 0.013 to 0.016 standard deviations for each snow day in Maryland. Additionally, Goodwin (2014) found that students attending poor schools in Massachusetts experienced a decline of 0.014 standard deviations in math and 0.016 standard deviations in reading for each snow-induced day of school closure. Relatedly, research into learning loss in the wake of school closures caused by Hurricane Katrina in 2005 found decreases in achievement at an approximate magnitude of 0.10 standard deviations in the year following the disaster.

Finally, the literature considering absenteeism generally has found that missing just ten days of school can negatively impact math test scores by 0.06 to 0.08 standard deviations and can negatively impact English language arts test scores to a slightly smaller degree (Aucejo & Romano, 2016; Gershenson, Jacknowitz, & Brannegan, 2017; Liu, Lee, & Gershenson, 2019). Additionally, this literature indicates that the negative impacts of absences are linear, with each additional absence causing similar learning loss, regardless of the number of absences previously accrued (Gershenson, et al., 2017; Liu, et al. 2019). This means that the more days a student is out of school, the worse their learning loss will be.

Based on this previous research, a few early studies have offered predictions regarding the impact of the unprecedented school closures caused by COVID-19. Kuhfeld and colleagues (2020) estimated that children were likely to return to school in fall 2020 with 63 to 68 percent of the learning gains in reading and 37 to 50 percent of the learning gains in math than might be expected from a typical school year. Estimates of learning loss by Stanford University's Center for Research on Education Outcomes further estimates that 0.31 standard deviations is approximately equal to a full year of learning. And the negative impacts of being out of school are also likely to be greater for students from low-income households (Chetty, et al., 2020; Cooper, et al., 1996; de la Rosa, 2020; Doran, Hancock, Sarakatsannis, & Viruleg, 2020; Kuhfeld & Tarasawa, 2020; Center for Research on Education Outcomes, 2020) and for Black and Hispanic students (Doran, Hancock, Sarakatsannis, & Viruleg, 2020, Kuhfeld, et al., 2020). Moreover, Hanusek & Woessmann (2020) note that "with experimentation into partial in-class work, partial video work, asynchronous presentations, and the various new inventions of schools, just counting past school days lost is almost certainly underestimating the total learning loss" (7).

COVID-19 is also likely to have a negative impact on children's psychological and social-emotional well-being. For example, research found that students continued to exhibit signs of psychological distress and had trouble concentrating for several years after natural disasters (Picou & Marshall, 2007; Duncan 2018). COVID-19 has brought with it significant economic shocks as well as a direct health threat, both of which are more likely to impact low-income students and students of color. Notably, low-income families were already those most negatively impacted by the economic downturn caused by COVID-19, leading to higher rates of housing insecurity, food insecurity, and family insecurity (Kuhfeld & Tarasawa, 2020). These all contribute to trauma that this cohort of students is likely carry with them, not just in school but beyond as well.

As schools reopened in the fall, the shift by many school districts to incorporate at least some distance or virtual instruction is also likely to impact total learning (Hanusek & Woessmann, 2020), particularly as it highlights the realities of the digital divide. In fact, by April 3–4, a Gallup poll found that 83 percent

of parents indicated that their child was involved in a school-provided online learning program (Brenan, 2020). Additionally, a national survey of teachers conducted by EdWeek found that, as of April 8, 39 percent of teachers were interacting with their students digitally (frequently by email) at least once per day (Kurtz, 2020). Unfortunately, however, an Education Trust (2020) poll found that 42 percent of families of color and nearly half of low-income families lacked sufficient devices in their home for children to access distance learning (de las Rosa, 2020; Kuhfeld, et al. 2020). Additionally, 8.4 million households, or an estimated 16.9 million students, did not have access to the internet at home (de la Rosa, 2020). Therefore, many students were incapable of accessing their education, even when teachers have made themselves and their instructional materials available, ultimately exacerbating the COVID slide.

The negative impacts of extended school closures are especially troubling for early learners who are in the process of developing the foundational skills, particularly in reading, that they will require in order to achieve long-term success in school and beyond. Recent research and the accompanying public policy around early education acknowledge this as a critical development window. Like their older counterparts, the vast majority of three- to five-year-olds lost two to four months of in-school learning due to the COVID-19 pandemic. However, unlike their older counterparts, home learning supports for preschool-aged children were particularly weak (Barnett & Jung, 2020), and emerging reports indicate that our youngest learners have experienced the largest learning losses due to COVID-19 (Bielienski, Brown, & Wagner, 2020). Indeed, it is easy to imagine that the pivot to virtual education delivery did not extend much to pre-kindergarten students, as preschool attendance is not compulsory in any state. As a child's capabilities when they enter kindergarten are a strong indicator of long-term academic success (Duncan, et al., 2007; Friedman-Krauss, Barnett, and Nores, 2016; Phillips, et al., 2017; Reardon & Portilla, 2015), continued weak support for early learners could have long-lasting negative consequences. Therefore, it is crucial that early learners receive age- and skill level-appropriate academic support and that parents are supported as their child's first teacher.

Knowing that COVID-necessitated school closures were likely to significantly exacerbate typical summer learning losses, philanthropic partners challenged Waterford.org to adapt our year-long Waterford Upstart school readiness intervention to address the pandemic "learning cliff" that was disproportionately impacting the country's most vulnerable learners. Thus, we designed the Waterford Upstart Summer Learning Path (SLP), a model we knew, based on years of data, could deliver school readiness outcomes in just 13 summer weeks (June 1 to August 31, 2020).

What is Waterford Upstart?

Waterford Upstart is an innovative in-home, technology-delivered school readiness program that children use for 15 to 30 minutes each day, five days a week. The software itself presents a wide range of multimedia-based activities in an adaptive sequence tailored to each student's individual placement and their individual rate of growth. Instructional strands include phonological awareness, comprehension and vocabulary, reading fluency, and language concepts (i.e., print concepts, grammar, and mechanics of written and spoken language). With 38 studies completed and more underway, Waterford Upstart's gold standard evidence of effectiveness with diverse populations has been thoroughly vetted in the most rigorous contexts and was critical to receipt of a federal Education

Innovation and Research (EIR) Expansion Grant (2018-2023) and an Audacious Project (2019) award. Waterford Upstart’s third-party randomized controlled trial (RTC) study for the US Department of Education produced significant and sizeable positive effects: 0.42 standard deviations of improvement for the reading group relative to the math group and 0.38 standard deviations of improvement for the math group relative to the reading group (Overby, Hobbes, & Thomas, 2017). Nationally, over 91 percent of children using Waterford Upstart in the year before kindergarten are ready for kindergarten, compared to 65 percent nationally (Harris, no date). Most importantly, these results are lasting, with an external longitudinal study showing that Waterford Upstart students generally and across all subgroups (special education, minority, low income, and English language learner populations) outperformed their non-Waterford Upstart peers for years after program use (Suddreth, Throndsen, & Wiebke, 2016).

Waterford Upstart’s innovative blend of adaptive, personalized early learning software within a developmentally appropriate usage model helps families learn to monitor family screen time and use technology for educational purposes. The program also builds capacity for parental engagement with parent training and ongoing personalized coaching offered remotely. This support helps parents improve the home literacy environment and understand the importance of early learning to their child’s future learning success.

Additionally, Waterford Upstart directly addresses the technology gap, a significant barrier to accessing virtual learning noted by the COVID slide literature (de la Rosa, 2020; Education Trust, 2020; Kuhfeld, et al., 2020). When families need them, Waterford.org provides a computer and/or internet access so that children can participate. The entire program, including computer and internet, are provided at no cost to families.

Waterford Upstart Summer Learning Path

When COVID-19 necessitated school and daycare closures across the country, children using Waterford Upstart did not experience service disruption.¹ Knowing this, Waterford Upstart’s philanthropic partners hoped we could leverage our unique strengths—access, flexibility, parent empowerment, and evidence—to help families recover learning losses over the summer so their children could still achieve school readiness before kindergarten. Working carefully with our research team and philanthropic partners, we designed a Pandemic Recovery model that we knew, based on years of data, could deliver school readiness outcomes in just 13 weeks. We called it the Waterford Upstart Summer Learning Path (SLP).

With philanthropic support, recruitment began in May and continued through mid-June to ultimately serve over 13,100 students in Arizona, California, Delaware, Florida, Indiana, Mississippi, New Mexico, Ohio, Texas, and the Navajo Nation. In all 76.9 percent of enrolled children lived in households with incomes 200 percent of the federal poverty level or below, 33.4 percent were Black, 37.9 percent were

¹ Children using Waterford Upstart and attending a site-based program may have experienced disruption of their site-based service. Waterford Upstart software access was not disrupted by COVID-19.

Hispanic, and 19.8 percent were English language learners. Additionally, Waterford.org provided computers to 57.3 percent of enrolled families and provided internet access to 19.4 percent of enrolled families.

While Waterford Upstart’s in-person parent training events have always been a hallmark of implementation success, the health risks posed by COVID-19 required a pivot to an entirely virtual training. Therefore, we developed seven short training videos, explaining the various aspects of the program including the pre- and post-program skills assessments (Waterford Assessment of Core Skills (WACS)) and the daily usage requirement. Knowing that many families lacked the technology and/or internet access required to take this first step, let alone have their child access the software, Waterford.org preemptively shipped computers and internet access points to the families in need of them. As with all implementations, SLP participants also received the support of our Family Education Liaisons, personal coaches who proactively reach out to families to support them, as well as access to offline resources and activities through the Waterford Mentor website and mobile app. Learning outcomes for Summer Learning Path participants were excellent.² Using the software for 25 minutes each day, five days a week over the course of 13 weeks, children gained an average of 572 points as measured by the Waterford Assessment of Core Skills (WACS) to achieve an average grade equivalence of Kindergarten Advanced, or the point that children might be expected to achieve at the end of kindergarten. We know, however, that software usage alone does not drive these results. It is the combination of parent buy-in, ongoing motivation and supports, parent coaching, engaging software, and the access to technology that produce high fidelity implementation that ultimately leads to results.

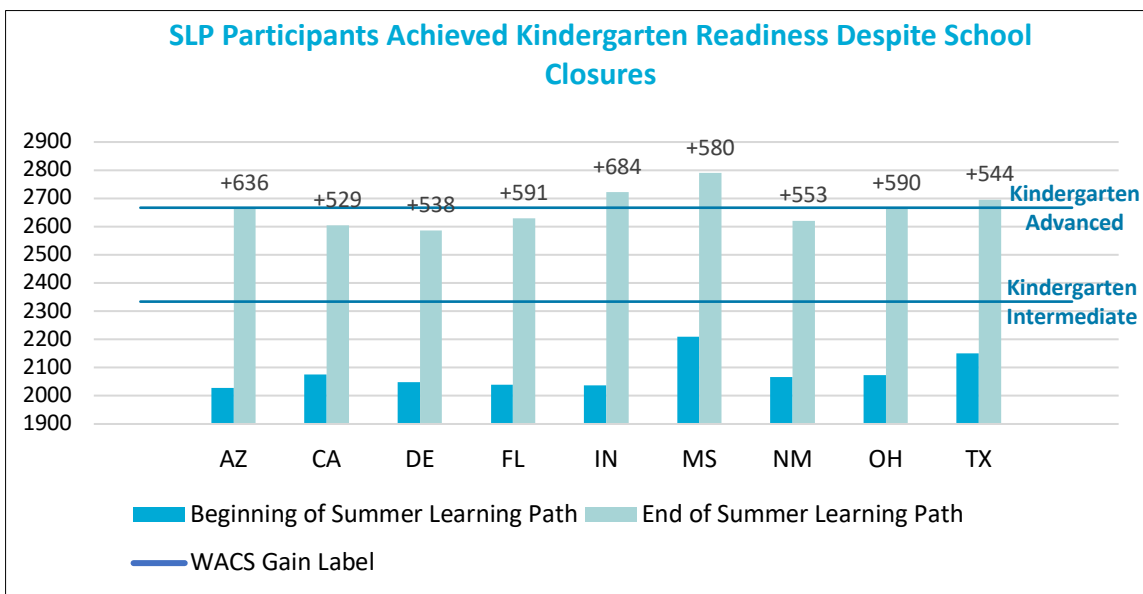


Figure 1: SLP and Kindergarten Readiness

² See Figures 1-5 for results

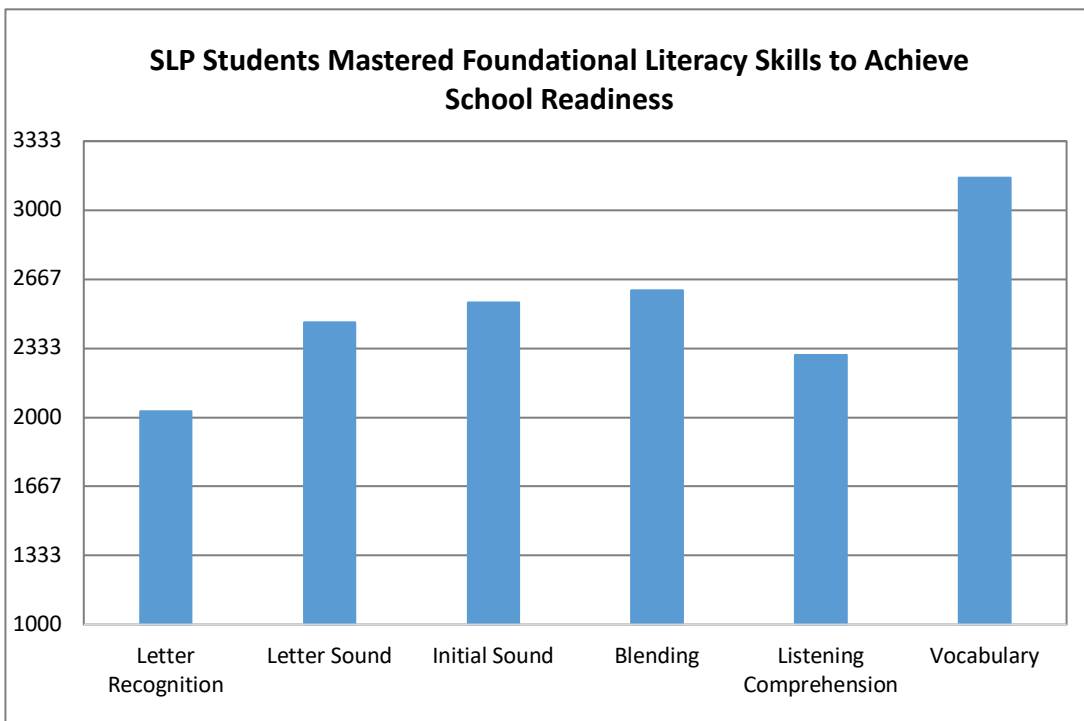


Figure 2: SLP and Foundational Literacy Skills

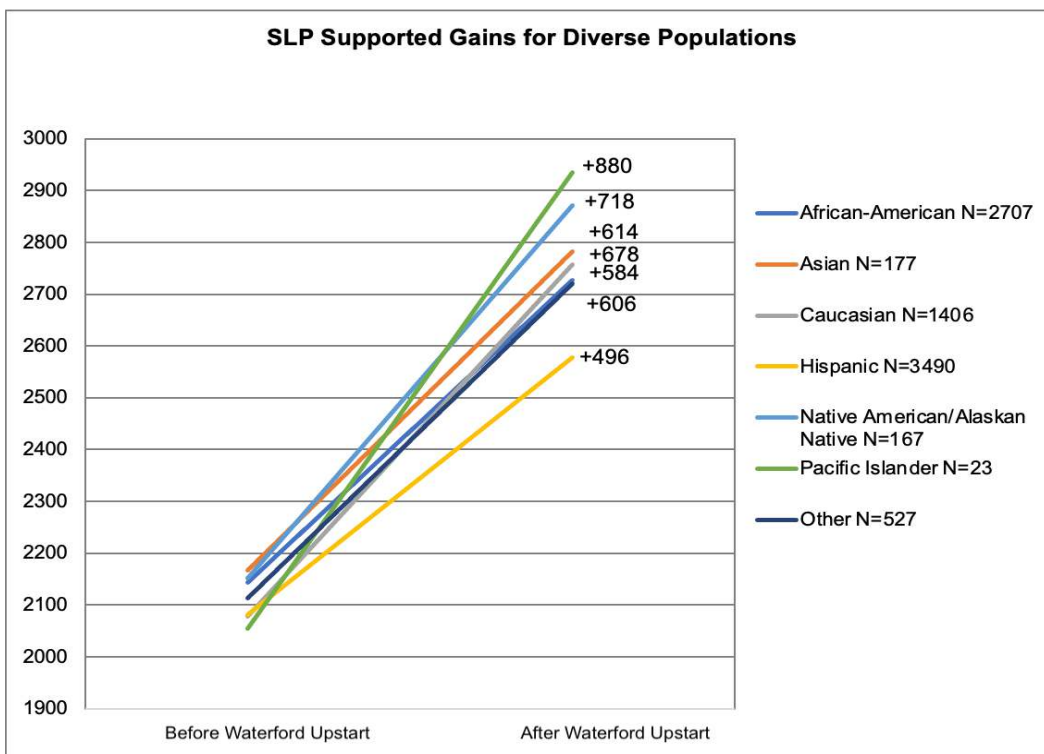


Figure 3: SLP Gains for Diverse Populations

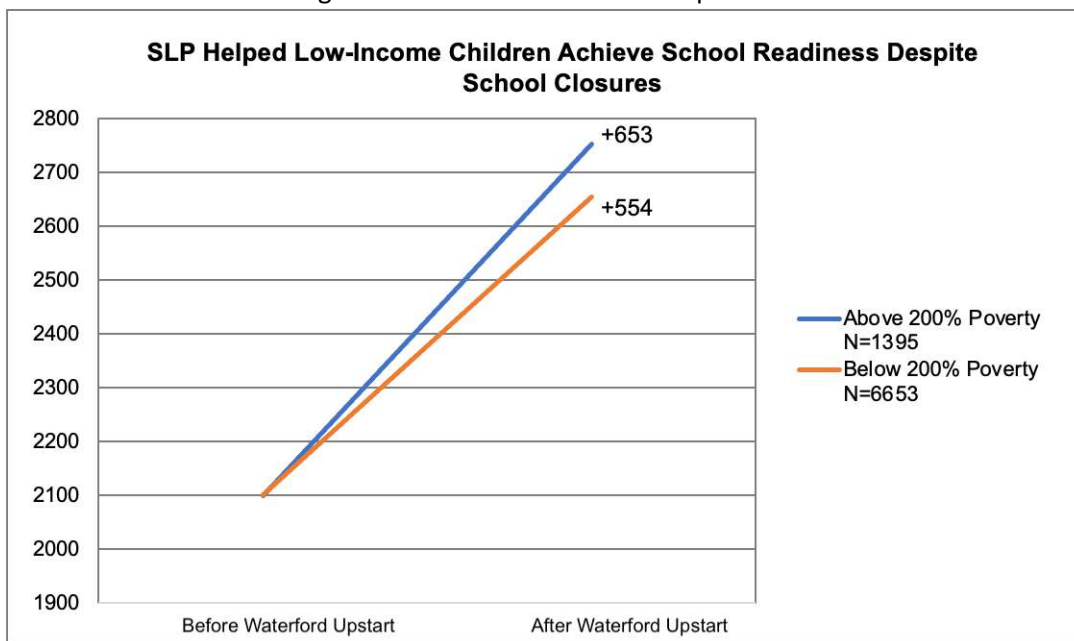


Figure 4: SLP Gains for Low-Income Children

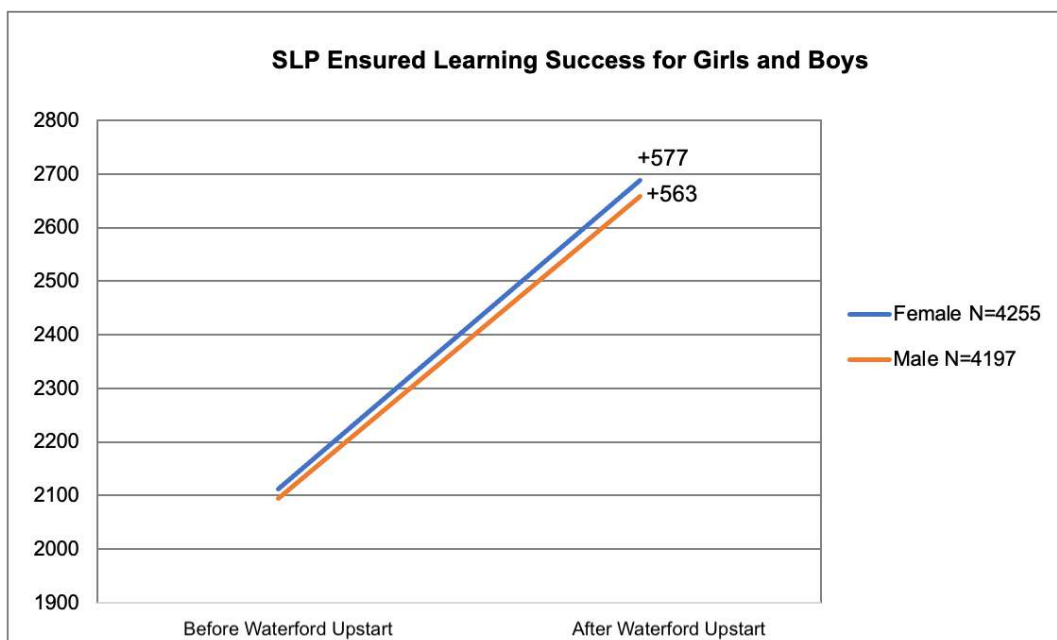


Figure 5: SLP Gains for Girls and Boys

With the SLP model, children were older when they started using the program, which may have accelerated their learning gains. Many parents also may have engaged more actively in their hope to mitigate the COVID slide.

Significantly, parent satisfaction and perceived impact was high. End-of-program parents survey results indicated:

- 98 percent of parents said Waterford Upstart was helpful in preparing their child for kindergarten.
- 95 percent of parents felt more prepared to support their child’s education because they had participated in Waterford Upstart.
- 94 percent of parents said that they and their child spent more time exploring letters and words (letters, letter sounds, rhyming, etc.) because of the Waterford Upstart program.

Due to its success, iterations of this proven condensed format are now being used as a Pandemic Recovery Path, offering the same intervention during the typical school year to help children catch up and succeed.

Conclusion

The early childhood period between pre-kindergarten and third grade has been called the “tipping point” by experts in the field (Atchison & Diffey, 2018), as it is the most opportune time to eradicate early achievement gaps. Learning losses due to COVID-related school closures and in-person/distance hybridization of schools upon reopening are likely to be steep. Therefore, in the time of COVID-19, it is critical that all children receive supports for daily learning activities, as well as resources and training for parents who have become their child’s only teacher (Barnett & Jung, 2020). Waterford Upstart has long been shown to effectively prepare our youngest students to be ready to learn when they enter school. The Summer Learning Path has further demonstrated that Waterford Upstart can be utilized as a concentrated response to head off learning loss, particularly for those students who might be expected to experience the steepest declines from being out of school—low-income and minority students and those with little or no access to technology.

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