Research Foundation: Ignite by Hatch™

Hatch Early Learning

Since 1984 Hatch Early Learning has had the same mission, to be a pioneer in delivering developmentally appropriate solutions to early childhood classrooms. As technology and learning have evolved over the last 30 years, Hatch continues to be the leader in how early learning programs and the children they serve benefit from technology.

The Hatch suite of early learning solutions complements and enhances your classroom and supports early learners in reaching their next learning milestone. Hatch's early learning solutions build foundational skills across seven domains of learning in an interactive and engaging environment designed to foster a love of learning in young children.

Our products are built to make educators' lives easier, providing children with digital learning experiences that focus on whole-child development, supplying educators with objective data, and supporting each child and their individual learning goals.

Ignite by Hatch

Ignite by Hatch is a digital learning platform anchored in a child-facing app that delivers engaging, research-based learning experiences across seven domains of learning through a dynamic digital play environment.

When designing Ignite by Hatch, at the center is the developing child; however, to ensure children are supported as they learn, there is a strong focus on the full ecosystem of the child (Bronfenbrenner, 1981) that includes the educator as well as the family. To inform the development of this product, we built a foundational framework backed by research:

For the Child:

- Gamification & Play-Based Learning
- Developmentally Appropriate Independent Learning
- Guided Practice for Continued Success
- Progress & Growth

For the Educator:

- Joyful Rigor
- Data Driven Instruction
- High-Quality Professional Development

The Family:

- Thoughtful Family Engagement

This document walks through the intentionality and the *why* behind the development of Ignite by Hatch starting of course, with the child.

The Child

Gamification & Play-Based Learning

Gamification or game-based learning is the use of gaming concepts to create gaming experiences. Traditional game components such as experiencing mistakes, disappointment, accomplishment, knowledge, and reflection can all be simulated through gamification, while also incorporating academic concepts. Therefore, using technology to build a digital play-based learning environment can increase student engagement and intrinsic motivation and also address the needs of various learning styles (Rajesh et al., 2021). Gamification includes concepts like accomplishment, personalization, and autonomy.

A key concept in gamification is experiencing a sense of accomplishment. Ignite provides a rich rewards system for children in which every game, or experience as they are referred to in Ignite, a child plays earns a gold star for completion. Once three gold stars are earned, children are invited to select rewards for their personalized avatars.

Personalization in digital learning refers to an environment that is individualized to a child's knowledge or interests where the child has agency and control over aspects of their digital learning experience (Shemshack & Spector, 2020). A child's journey in Ignite starts with creating a personalized Ignite avatar called their "buddy". The child's buddy accompanies them as they progress through Ignite.

Autonomy in the context of gamification refers to the freedom of choice and control over one's actions. Autonomous learners tend to actively reflect on processes. This enables them to solve problems and naturally leads them to contemplate and incorporate methods and skill sets that enhance and expedite their progress. These learners are also aware of their abilities and are eager and active when they learn (Sokol, B. W., Grouzet, F. M. E., & Muller, U. (Eds.), 2015).

Each Ignite set of experiences begins in the Magic Tree House. From here, children choose which experience they would like to play alongside their avatar/buddy. The experiences that are shown to children, follow the Ignite scope and

sequenced progression while also giving the child the autonomy to choose which activity they want to complete next.

Developmentally Appropriate Independent Learning

In addition to creating an engaging product, Ignite is designed to promote independence within a digital learning platform by allowing children to login and navigate without the support of an adult. As part of Ignite's development it was important to also take into consideration the developmental appropriateness of screen time. Research recommends less than two hours of screen time per day for children ages three to six, (Kamaleddine, 2022). Ignite was developed with this in mind and is designed to be played 30-minutes a week.

The design of Ignite's independent learning environment saves teachers time and guides young learners through every step of their Ignite journey. For example, children are presented with our patented, two-step authentication process, which requires children to choose their own photograph in order to login and play. As children play, familiar characters (and each child's personalized avatar) provide verbal and visual tutorials, consistent positive redirection, and ongoing, just-in-time guidance.

Guided Practice & Continued Success

To support Ignite's independent play model, guided practice is provided within the product to support children throughout their experience. Guided Practice is a method of student-centered learning where educators instruct children in a way that moves them from their current level of understanding to a deeper level of understanding. Ignite's Guided Practice follows a three-step progression referred to as "I do, We do, You do". This progression is based on the Gradual Release of Responsibility Model of Instruction that suggests cognitive learning should begin with educator instruction (I Do), transition to joint responsibility between students and educators (We Do) and move to independent practice (You Do) (Frey & Fisher, 2013). This model is based on the principle of scaffolding or providing adult support to complete a task or learn a skill a bit beyond the child's

current scope of learning to help the child acquire skills to complete the task independently (Wood and Wood, 1996).

In Ignite when a child does not successfully demonstrate understanding of a skill, they are placed into a Guided Practice experience. The Guided Practice progression starts with the skill being modeled (I do) and transitions to the child practicing the skill with support (We do). Lastly, the child completes the experience skill independently (You do). The goal is to help children gain competence and confidence through their learning progression.

Progress & Growth

Through various features and functionalities, Ignite can evaluate children's progress and growth, which is a critical part of any early education product. To assess children's understanding of different academic skills, educators often use a mastery criterion to gauge their performance. Mastery criterion refers to a set of rules that educators use to determine if a child has "mastered" or proven their understanding of a specific skill. This criterion can be based on level or performance (the number of correct responses) or frequency of observations (the number of times the mastered skill is observed in consecutive sessions) (Fuller & Fienup, 2018).

When mastery criterion is developed based on the level of performance, educators and researchers generally set mastery levels between 80% and 100% accuracy (Fuller & Fienup, 2018). This means that if a child scores between 80% and 100% on a given measure they have "mastered" the skill. In Ignite, the mastery criterion level of performance is set at 80%. Children have multiple opportunities to practice each skill and work toward mastery. Most digital experiences in Ignite have at least five opportunities within each experience, which gives children five chances to demonstrate mastery of a skill.

The Educator

Joyful Rigor: Seven Domains of Learning

The the guiding force of the purpose and intent of learning standards is preparing children to succeed and thrive in the 21st century world. The early years, preschool and early elementary, are recognized as both the foundation for children's overall learning and development and the foundation for their global and digital citizenship. Children are refining their critical thinking and becoming active and engaged learners as they acquire knowledge and understanding of science and technology, social studies, literacy, language, and mathematics, along with the knowledge and skills and capabilities to be healthy, safe, and productive citizens of an increasingly more complex world (Slade, Sean, & Griffith, D. 2013).

"Relevant learning outcomes must be well defined in cognitive and non-cognitive domains, and continually assessed as an integral part of the teaching and learning process. Quality education includes the development of those skills, values, attitudes, and knowledge that enable citizens to lead healthy and fulfilled lives, make informed decisions and respond to local and global challenges." (Incheon Declaration for Education, 2016).

Additionally, all educators have comprehensive objectives, standards, and skills they are required to meet, which encompass all of these key foundational skills. This is why Ignite covers all seven of these domains of learning and development and continuously evaluates and updates them to meet the changing needs of educators.

Joyful Rigor: Literacy, Language & Communication, & Mathematics

Foundational Literacy

The renewed and heightened focus on children's literacy learning – in the context of the demands of the 21st century world – has informed both national (Common Core State Standards for English Language Arts & Literacy) and state-level standards. Ignite addresses Literacy through a well-rounded collection of

Subdomains and Strands including Phonological Awareness, Phonics, Reading, Listening Comprehension, and Writing.

Language & Communication

Not only is language "the heart of life's experience, particularly for children who are developing language critical to cognitive development and learning" (American-Speech-Language-Hearing Association, 2006), but the skills and understanding of language are "fundamental for academic and professional success" (Colorado Department of Education, 2020a). Ignite addresses each component of language knowledge and understanding in consistent and cross-contextual methods, which includes subdomains for Listening & Understanding, Receptive Language, Vocabulary, Academic Vocabulary, and Conventions of Language.

Mathematics

In the early years and early grades children need to acquire mathematical skills and knowledge and develop their understanding and ability to be "mathematical thinkers and problem solvers" (NCTM, 2013). In the Head Start Early Learning Framework, math knowledge and understanding are categorized and placed under the cognitive domain (U.S. Department of Education, 2015). The Ignite Mathematics Domain addresses Mathematic Applications, Geometry, Counting & Cardinality, and Operations & Algebraic Thinking.

Joyful Rigor: Social Studies, Science & Technology, & Physical Development

Science & Technology

In the early years, children's scientific knowledge and understandings focus on developing their scientific thinking through 'action' and 'doing' (NSTA & NGSS, 2013). The well-rounded delivery of Ignite's digital and hands-on experiences ensures children can investigate and discover across Physical Science, Life Science, Earth Science, and Simple Tools and Technology.

Social Studies

The emphasis on 21st century skills is not limited to the domains of children's

science and technology learning. If anything, 21st century skills of inquiry, analysis, critical-thinking, active engagement in life at school, at home, in the community, and beyond begin with children's social studies learning, their understanding of themselves, knowledge of their lives, awareness of the many communities they are a part of, and responsible participation as a citizen of the United States and the world (NCSS, 2017). Through the Social Studies Domain, children engage with experiences dedicated to exploration through Self-Identity and Community Awareness.

Physical Development

Physical development encompasses more than just physical activity, gross-motor skills, and fine-motor skills. Physical development involves children's overall health including their mental and emotional wellbeing, as well as how their physical bodies grow, which includes learning about healthy habits (like safety, nutrition, and self-care practices) (Centers for Disease Control and Prevention, 2013; Donnelly, et al., 2016; Jones, Greenberg, & Crowley, 2015). Through the Physical Development Domain and subsequent subdomains Nutrition, Self-Care, and Health & Safety, Ignite delivers a robust library of experiences that provide explicit instruction as well as opportunities to practice activities and routines to further influence their understanding, knowledge, and development of their own personal beliefs and attitudes around physical health and self-care practices.

Joyful Rigor: Social & Emotional Learning

Social & Emotional Learning

Scientific research has established that if all children are to achieve their developmental potential, it is important to lay the foundation during the earliest years. The importance of so-called noncognitive skills—which include abilities and traits such as critical thinking skills, problem solving skills, social skills, persistence, creativity, and self-control—manifests in multiple ways throughout our lives. For example, persistence and communication skills are critical to success at work, and respect and tolerance contribute to strong social and civic relationships (Duckworth & Yeager, 2015).

Ignite engages young learners in social and emotional experiences by way of several subdomains and skills including Social Problem Solving, Identifying Emotions, Self-Identity, Self-Management, and Responding to Emotions. In addition to digital experiences, Ignite provides hands-on extension activities for educator implementation and at-home activities, which provide families and their young learners' access to activities supportive of social and emotional development.

Data-Driven Instruction

Beyond the education content and skills covered in Ignite, educators have access to rich data surrounding these learning domains. Data-driven instruction is an educational approach reliant on a continual feedback loop of information for nimble and responsive teaching that provides the support students need in real time. According to research, data-driven instruction can support improved student performance (Wohlstetter, Datnow & Park, 2008). Ignite includes aspects of data-driven instruction backed by research including progress monitoring and content to drive small group differentiated instruction.

Progress monitoring is a form of assessment in which a child's progress is tracked and regularly monitored to provide feedback to educators. Research shows that progress monitoring can be an effective tool to assess competence in several academic areas and help educators improve academic outcomes for their students (Fuchs & Fuchs, 2001). As children engage with Ignite, data about progress is shared with educators and parents via Insights, the cloud-based reporting hub for Ignite. Ignite's progress monitoring includes information about the skills a child has successfully completed, as well as skills with which they may need additional instruction and practice. When a child does not successfully complete an Ignite experience, Insights notifies the teacher and delivers a collection of hands-on, supplemental extension activities, as well as small group activity suggestions to maximize individualized instruction.

High Quality Professional Development

Beyond the product itself, a critical component to Igniteis implementation and professional development. Professional development is strongly tied to school-improvement efforts and, recently, there has been an increasingly urgent need for more professional development opportunities to ensure that programs are high quality and effective. We know from research and best practices that "effective professional development is defined as 'structured professional learning that results in changes in teacher practices and improvements in student learning outcomes'" (Darling-Hammond, Hyler, Gardner, 2017). Educators not only need professional development in the form of training and resources but also with real-time data to effectively support their teaching practices. With the direct professional development opportunities provided by Hatch, educators can be fully supported in all areas of data-driven instruction.

Training

Successful professional development has a noticeable impact on teachers' work, both in and out of the classroom, and has an impact on teachers' beliefs and behaviors. Specifically for implementing technology, "a school can have the best hardware and software available, yet it is unlikely they will be used well, or even used at all, if educators are not trained. Training educators on the integration and use of technology appears to have a significant impact on whether they feel comfortable in using technology," (Hasselbring et.al, 2000). The training delivered by Hatch incorporates all the elements needed to ensure effective, efficient, and engaging professional development such as active learning, collaboration, coaching, opportunities for feedback and reflection, and sustained duration (i.e., adequate time to learn, practice, implement, and reflect upon new strategies that facilitate changes in their practice). The training opportunities are facilitated by Hatch expert trainers and rooted in best practices of adult learning theory; therefore, all styles of learning are incorporated, and educators will be confident in utilizing the technology as well as tangibly implementing plans for their classrooms.

Insights

Hatch not only designed a developmentally appropriate suite of learning opportunities for children in Ignite, but the same has been done for educators through the creation of Insights. Insights is our web-based, reporting and data system, designed to provide educators with straightforward, just-in-time data about their classroom as a whole or individual children. As children play in Ignite, their interactions synchronize to Insights, allowing educators to see real-time progress for all the children in their class or for individual children. While we know how critical data is, "data is becoming more abundant at the state, district, and school levels—some even suggest that educators are 'drowning' in too much data," (Marsh, Pane, Hamilton, 2006). However, Insights shares straightforward, just-in-time data that is reflective of progress for each classroom, as well as for individual children.

Studies have shown that "while online data systems and software may have reduced time needed to summarize, display, and even run basic analyses of quantitative data, deciding how to act on these results required time that many educators lacked." (Marsh, Pane, Hamilton, 2006). Insights not only shows educators gaps in skill development, but the reporting system also delivers customized grouping suggestions and extension activities. extension activities are hands-on, teacher facilitated activities that help to alleviate the stress of creating differentiated activities and/or lessons. Research suggests that planning lessons is a complex process, and it is widely acknowledged that novice educators find planning to be a challenging, time-intensive task (Sahin-Taskin, 2017), which is why our hands-on experiences are flexible enough to address a variety of group sizes, require minimal preparation, and utilize readily available materials. In addition, through the power of Insights reporting system, teachers have objective data to support the individual needs of the children in their classroom.

Thoughtful Family Engagement

The final and most critical component of Ignite involves a child's first teacher, their family. Hatch has designed resources for family members that enable meaningful home-to-school connections to help raise awareness of learning

goals, strategies, and progress of children in real time, enabling teachers and families to work together toward child success. Research maintains that "family engagement is a critical component of high-quality early care and education. When done well, family engagement practices can support the healthy social, emotional, cognitive, and physical development of young children, regardless of ethnic or socioeconomic background," (Christensen, 2000). In addition, "decades of research link family engagement practices to positive outcomes for children related to school readiness, achievement, and completion," (Sheridan, Knoche, Edwards, Bovaird, Kupzyk, 2010). Hatch developed Ignite with the importance of family engagement in mind and integrated opportunities for educators to build strong foundations with their families.

Ignite at Home

In today's technology driven society and "with technology becoming more prevalent as a means of sharing information and communicating with one another, early childhood educators have an opportunity to build stronger relationships with parents and enhance family engagement," (NAEYC, 2012). Ignite is designed for children to have the opportunity to play at school or at home, therefore 'improving parents' own capacities and skills [which] has the potential to improve the quality of parent-child relationships and the home environment, leading to better outcomes for children," (Sabol et.al, 2018).

Family Insights Dashboard

Now more than ever before "early childhood educators have a responsibility to support parents and families by sharing knowledge about child development and learning. Technology tools offer new opportunities for educators to build relationships, maintain ongoing communication, exchange information, and share online resources with parents and families. Likewise, parents and families can use technology to ask questions, seek advice, share information about their child, and feel more engaged in the program and their child's experiences there," (NAEYC, 2012). The Family Insights Dashboard enables families access to data that mirrors what each child's teacher sees and supports families and educators to have ongoing, meaningful conversations about their child's growth and development.

At-Home Activities

Providing high-quality instruction tailored to children's unique developmental needs doesn't just have to be the responsibility of educators. With the understanding that "interventions that leverage technology and tools from behavioral science can also support changes in parenting practices," (Sabol et.al, 2018), Ignite makes it easy to provide families with individualized recommendations of how to support their child at home. Written in family-friendly language, these experiences build families' knowledge and understanding of child development while helping them engage their child in an activity that utilizes common household objects at home or on-the-go! Family members can refer to activities while they are waiting for appointments, driving, traveling, and so on. The questions provided are meant to spark conversations and engage children in critical thinking skills, listening, understanding, expressive and receptive language, while family members have a chance to enjoy some playful time with their child!

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