

Research Basis for Hatch Innovations

Solutions for Success in the Early Learning Environment

The purpose of this White Paper is to present the research basis for a powerful set of innovative products designed to prepare children to be ready and successful in school.

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The Early Learning Experts



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Executive Summary

This whitepaper represents the research-basis for the products Hatch both creates and makes available to the early childhood education community. We infuse our work with a deep understanding and integration of child development, pedagogy, learning principles, engagement, progress monitoring, and professional development. We do this for the purpose of providing and supporting high-quality learning environments and experiences for early learners and their teachers so that children have the best opportunity for school readiness and early school success. Throughout the document you will see attention to best practices by teachers and how they are connected to positive outcomes for children, culminating in key messages. We follow each major section by showcasing a brief selection of our best products that relate to that area. The document covers the many areas that are needed to fully represent the world of the early childhood classroom. The executive summary brings out for you the key messages in each of these areas.

We begin with outlining the major knowledge base about how young children learn in general and with technology.

Setting the Stage: How Young Children Learn. Learning occurs best in a supportive social context along with high quality instructional practices that balance child- and teacher-directed learning activities; with the teacher's scaffolding adjusting and adapting to the child's competencies. Play, when intertwined with guidance and purpose by the teacher, supports all domains of children's learning. Overall, being "multi-faceted" is the new role of the early childhood teacher. Teachers become organizers of the environment, facilitators, managers, and scribes for children as they play and explore and ultimately learn with materials and activities.

Educational and Instructional Technology. Young children are developmentally able to benefit from well-designed educational and instructional technology and such technology can positively support young children's learning. Both the content and the delivery of the content through design informed by pedagogy comprise the educational aspect and are centrally important for positive outcomes to be seen for early learners.

We next outline the major developmental and cognitive areas of growth and development and instruction.

Social-Emotional Development. A high quality preschool experience fosters the growth of key social-emotional skills with specific teaching practices and curriculum materials effective in promoting skill growth in this area. Most notable are those with a focus on a safe and welcoming environment with meaningful and appropriately challenging learning tasks.

Physical Health. Health and school success are intertwined. Attention to healthy practices in early childhood is important to lay the foundation for a child who is ready and able to learn to his or her fullest potential. Children benefit from guided experiences with making and practicing healthy choices and behaviors.

Literacy and Language. Language and literacy form the foundation for the vast majority of learning. Research recommends an approach that combines language- and literature-rich activities with whole language focused on increasing meaning, understanding, and a positive attitude toward language. With clear and direct instruction around skills needed for the development of fluency, and more opportunities for children to hear and interact with more advanced vocabulary and connected language being used by their teachers, children move more smoothly along to being proficient in reading.

Mathematics. Young children are very interested in mathematics and are capable of fairly advanced learning in this area. Unfortunately, in many cases in early childhood settings, children get very little mathematics instruction and what they receive is often very low level. While basic skills are absolutely essential, it is important to move beyond these, and the most successful approach is to help children think about their world mathematically while offering activities from their everyday lives to encourage context and relatedness.

Science. Building on young children's natural propensity to be curious connects best to a classroom environment that supports science learning. Providing a selection of appealing materials for exploration, adequate time for children to formulate and test their ideas, and a social atmosphere that conveys that inquiry-based approaches such as questioning and experimenting are as important as knowing the correct answers, are central to building knowledge in this area.

Social Studies. Children's active participation in society, both in the present and as adults, is supported as they are exposed to social studies. Experiences and situations that are relevant to children allow an effective mechanism for learning about social studies in the early childhood setting. In our increasingly culturally diverse and interdependent world, attention to these is important for children as well.



The diversity in our day-to-day world is reflected in our young learners as well.

English Language Learners. Young children are quite capable of learning early language and literacy skills in two languages, and many early language and literacy skills learned in their home language positively factor into English language/literacy and mathematics development. While many ELL early learners may perform behind their mono-language peers, there is a growing body of research-based best practices demonstrating positive results for these tenuous learners, such as using the child's home language in a strategic manner, ample practice, and explicitly connecting concrete to abstract concepts.

Special Needs Learners. Representing a very wide range of topics and considerations, we focus in this section on the use of technology with special needs learners. Children with special needs can experience success in school if their learning environments are adapted to their needs and goals. Technology can greatly facilitate their ability to participate in learning and appropriate content can engage and inspire them to progress. The great strides made with touch technologies in particular have been of great value to the learning experiences of many special needs children.

Two core elements which positively impact the educational setting and outcomes for young children are progress monitoring and the design and management of the classroom environment.

Progress Monitoring. Conducted appropriately, progress monitoring and appropriate assessment make a vital contribution which may make the difference between a child who is ready for school and a child who is not. Teachers who have the knowledge and skills to use the information gained through traditional and more informal methods such as portfolios, as well as more structured progress monitoring, help assure children attain the skills in literacy, math, science, social studies, and social-emotional functioning needed for success in the preschool years and throughout their school career. Technology-based built-in progress monitoring connected to generating the appropriate scaffolded experience for children is being used very successfully with early learners. Coupled with the information from such experiences allows their teachers to effectively offer targeted instruction and support to facilitate children reaching these important and necessary goals.

Classroom Environment Design and Management. The interactions that occur in a well-designed and managed classroom are the key to seeing their full potential for children's learning. When classroom set-up and management run smoothly, the teacher and children can attend to building strong, trusting, and responsive relationships with one another and to the excitement of learning. Research strongly supports that the primary mechanism by which children learn is through responsive interactions between themselves and adults. Together, emotional support, classroom organization, and instructional support offer great opportunity for young children's success.

We end with recognition of the essential role of early childhood teachers and importance of professional development.

Professional Development. Professional development is the wheel around which new knowledge and practices are imparted to teachers once they are on-the-job, a job that is both challenging and critically important not just to the children in their care at any given time but to our society as a whole. Professional development is about continuing education and gaining and refining best practices-based skills by teachers and has been demonstrated consistently to have positive impacts on children's learning. Important across many content areas and approaches, professional development about how to best use technology with children is particularly of high importance to teachers. It is interesting to note that the mechanism by which professional development is being more frequently delivered is technology. Teachers' understanding of using technology with their students may be facilitated by their own technology-based learning experiences.

Closing Thoughts

The purpose of this document is to bring together the research basis for a powerful set of innovative products designed to prepare children to be ready and successful in school. We present the research which defines "high quality" early childhood education programs with a focus on positive outcomes for young children. From this research, Hatch has culled a solid set of multi-dimensional and interconnected design principles on which the Hatch Innovative Product Line is built and which inform the products that we sell overall. Hatch is pleased to both use and promote this process and we hope that you gain a fuller understanding of the underpinnings of our work at Hatch through reading this paper.

Setting the Stage: Research Basis for How Young Children Learn

While physical, social/emotional, and cognitive functioning make up the three primary developmental domains, educators know these are interrelated in complex ways. Due to this, all the domains need attention because each influences the other. One good example is that children's early experiences are linked to their impulse management and social skills. When a child has self-regulation and can relate well to others, he or she can more fully benefit from an educational setting. This can then allow for growth in the cognitive domain. Research shows that understanding and attending to such links between domains is needed for high quality learning and development¹.

The landmark report "Eager to Learn: Educating our Preschoolers"² highlights that young children are better able to learn than current practices sometimes allow. An educational preschool experience with the goal of preparing children for kindergarten means including more academic areas such as letters and counting, as well as helping to build traits like being inquisitive, persistent, and independent. It is possible to motivate young children to learn concepts on their level by building on their natural eagerness to learn. Combining child-directed discovery along with direct teacher instruction on basic pre-academic skills such as vocabulary, language, and math supports the most effective learning for young children. A recent comprehension research review by the Institute of Education Sciences (IES) found significant relationships between the use of specific instructional strategies by teachers to promote and support children's higher-order thinking and creativity (such as talking about ideas, reasoning about events in the future), giving feedback to children about their ideas and efforts, and children's competence in areas related to academics and language³.

Using Intentional Teaching Approaches with Young Children. Numerous longitudinal preschool interventions have found lasting and positive effects for children when the programs are of high quality and allow for both teacher- and child-directed learning; and further that these programs generate a high return on investment⁴. While early childhood professional organizations acknowledge the vital place of instructional intentionality and children's engagement in both types of learning activities, many classrooms are still set up for play activities that each child chooses, despite research that this type of classroom organization yields smaller gains in learning for children compared to classrooms which also have learning activities that are teacher-directed³. The following section outlines key evidence-based practices and features that represent such programs⁵.

Program Features. Several features of preschool programs are connected to school readiness. The social relationships between teachers and children, along with the nature of the classroom environment, contribute to effective learning for young children. For example, these programs have:

- A great deal of reading,
- Small group instruction
- One-on-one teaching for children learning difficult skills,
- Functional and environmental print displayed for children,
- The presence and use of playful lessons,
- Materials for play available that support literacy, and
- Opportunities for children to have meaningful experiences firsthand.

Teacher Practices. As shown, one of the best solutions for children being better prepared for school is for preschool teachers to be intentional in instructional practices for children. One example of an evidence-based approach to effective learning is through bringing in the three 'P's of Purposeful, Planful, and Playful⁵. The three 'P's work in the following way: Before choosing an activity, teachers will always first ask, "What is the purpose of this?" The answer should be:

- It builds one or more of the skills necessary for school readiness,
- It expands and builds on children's current level of understanding, and

- It encourages the understanding of new information that has direct links to what children will need to succeed in kindergarten.

Once these answers are in place, the next step involves careful planning, which will incorporate activities and materials that are purposeful but playful for young children, and that support both guided instruction and free play. This includes such areas as:

- Selecting activities that take advantage of the overlap between language, literacy, and math skill domains;
- Identifying fun phonological awareness games to use when transitioning children from one activity to another;
- Providing books, materials, activities, games, and conversations that are engaging and playful; and
- Using a scaffolding approach when working with children to broaden capacities and skills.

More about Scaffolding. Combining child-directed discovery along with direct teacher instruction on basic academic skills such as vocabulary, language, and math, as well as social skills, supports the most effective learning for young children ^{5/4(Landry 2004)}. Scaffolding sets up a positive and meaningful interaction between the child and the teacher. With foundations in well-established educational theory and practice (for example, Vygotsky's Zone of Proximal Learning⁶; and Differentiated Learning for individualized instruction⁷, scaffolding allows for teachers to build on each child's interests and level of functioning in order to develop skills. After a teacher models for the child, then she or he can guide the child in reproducing the behavior, determining along the way if the skill should be presented more simply or in a more advanced manner for the child, and finally seeing the child carrying out the target end behavior on their own. Children can learn very effectively when an adult scaffolds the instruction. This also helps children progress from being "other-regulated" (the teacher) to "self-regulated" as their attention, cognitive, language, and motor skills advance. The development of critical thinking as children interact with experiences is both a part of and an outcome of using scaffolding with children.

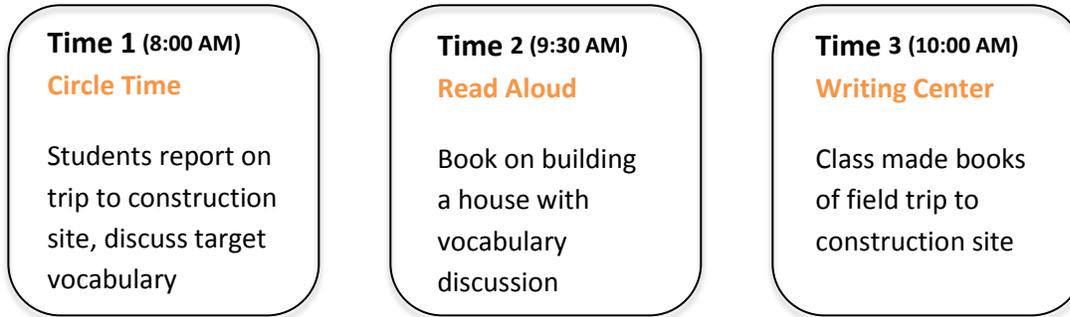
Adding the Power of Positive Interactions. The quality of teachers' emotional support for children includes such teacher practices as sensitivity to children's needs and effective use of behavior support strategies. Better social and academic/cognitive outcomes for children are found when teacher-child interactions consist of *both* higher levels of instructional quality and emotional support³.

Perhaps the single most important teacher practice for providing emotional support for children is ***consistently high levels of positive interactions***. Achieving this can best occur through a *Responsive Interaction Style*--which research shows consists of six key essentials for optimal support of young children's cognitive and social development⁵:

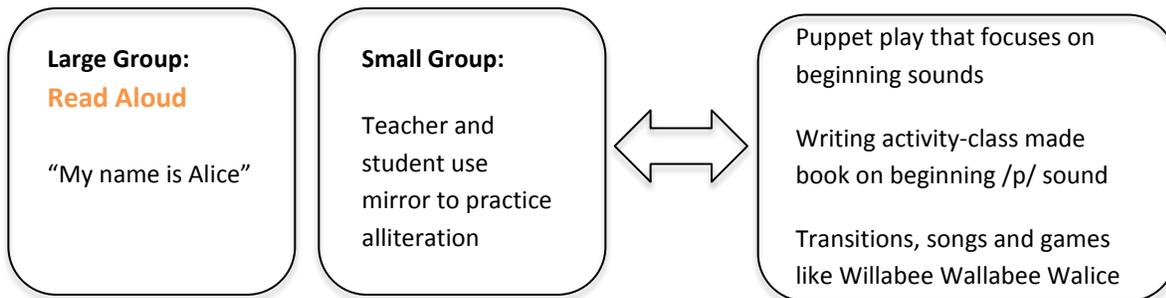
1. Rich language input: a) use of labels for objects & actions b) providing explanations & rationales
c) frequent book reading on many topics,
2. Responsiveness to children's signals,
3. Maintaining and building on interests,
4. Fewer restrictions,
5. More choice when providing strategies, and
6. Adapting support to children's changing needs.

The basic goal for early childhood teachers is to bring content together with a responsive interaction style. Methods to achieve this include:

- *Learning in a supportive social context.* Approaches are scaffolding, observing, pacing, modeling, questioning, commenting, and non-verbal cues such as gesturing.
- *Efficient development of memories.* Using "Time Windows" as children develop networks of associations with repeated learning experiences that are related in content.
- *Teacher planning that builds background knowledge.* How this can look across the day:



- *Balance of teaching strategies.* Example of direct and indirect instruction on teaching alliteration (beginning sounds of words).



- *Flexible groupings of children for learning:* One-on-one: Provides teacher opportunity to individualize instruction and meet special needs. Small groups: Allows children more opportunity for talking, provides teacher opportunity for scaffolding, encourages hands-on activities and child discovery. Large groups: Builds a sense of community, sets the stage for the introduction of theme, provides opportunities for information about new concepts.

The Power of Play

Play for young children serves many purposes. Chief among these is the role of play in the cognitive, social/emotional, and physical development of children⁸⁻¹⁰. Cognitive skills include language development (both verbal and non-verbal), imagination, and creativity. Social skills include social competence such as conversational skills, turn taking, and taking the perspective of others¹¹⁻¹³, while physical skills can include gross and fine-motor and perceptual-motor¹².

In defining play, a helpful description shows play as an activity that is¹⁴:

- Valued positively by the player,
- Self-motivated,
- Freely selected, and
- Engaging for the player.

To help children enjoy and learn through play, an early childhood setting that supports discovery and exploration has been shown to be the most effective, but as discussed it is not only about free choice. More specifically, this means allowing young children to have hands-on experiences and to manipulate materials in an environment purposively planned by the teacher, so that children can learn and practice skills and concepts⁹.

The early childhood teacher has a central role as a facilitator of play in the classroom¹⁰. The following represent key components of this important role⁹:

- Organization of materials to support children’s use of the them;
- Planning adequate time so that children can engage in more complex play; and



- Integration of instructional objectives, allowing the children to include their own original ideas, approaches to solving problems, and the opportunity to follow their own interests.

Key Message: Learning occurs best in a supportive social context along with high quality instructional practices. Cognitive and social-emotional readiness can be achieved in ways that support the whole child. Teacher's scaffolding needs to adjust and adapt to a child's competencies. Play, when intertwined with guidance and purpose by the teacher, supports all domains of children's learning. Overall, being "multi-faceted" is the new role of the preschool teacher. Teachers become organizers of the environment, facilitators, managers, and scribes for children as they play and explore and ultimately learn with materials and activities. While doing so, the child-directed learning will add to the teacher-directed activities. This leads to a successful balance for optimal learning.

Educational and Instructional Technology

It is well established that three- and four-year-olds need a strong focus on cognitive development along with attention to their social/emotional development to be ready for kindergarten. Technology can play a strategic role in this preparation. Experts confirm that preschool age children are developmentally ready and able to benefit from instruction with technology. The use of educational technology is now known to have a major, positive impact on the social, emotional, language, and cognitive development of children.

It is recommended that many opportunities be given during the preschool years for exploration using technology tools in a playful, supportive environment. Researchers further agree that a number of technology applications have the potential to support and extend learning in the young child through their unique capability to provide excellent instruction in these important developmental areas that are critical for educational success.

Looking at the research historically demonstrates the deep foundation which has been built over several decades. For example, preschoolers who used computers with supporting activities for key learning goals had more gains than children without computer experiences. Among others, these included gains in knowledge, long-term memory, verbal skills, problem solving, and manual dexterity¹⁵⁻¹⁷. A set of studies with low-income children found those who received a computer curriculum had increases in cognitive, motor, and language scores compared to similar children in a regular curriculum^{18,19}. Young children who had access to a computer, compared to those who did not, performed better on measures of cognitive development and school readiness, including those measured with intelligence scales. The lead author notes the findings suggest that "computer access before or during the preschool years is associated with the development of preschool concepts and cognition"²⁰.

Interactive touch technology has now made its way rapidly into early childhood education settings. One of the most exciting developments in educational technology is the interactive nature that is now possible with touchscreen devices in particular. The revised joint position statement on technology and children developed by the National Association for the Education of Young Children and the Fred Rogers Center in 2012 provides many recommendations which take this interactive nature into account²¹.

Recent results from a survey of 500 early childhood educators²² showed that teachers are using interactive educational technology most frequently to introduce and extend concepts. Further, children do have quite a lot of control over their own choices and actions. Helping teachers learn to reliably evaluate and use educational technology options is essential to ongoing success in providing the best experiences for children. The NAEYC Young Children article "Finding the Education in Educational Technology" discusses these issues and includes a Toolkit for programs to use for this purpose²³.



Research is beginning to build around child outcomes using interactive educational technology. Feasibility studies find young children quickly learn how to use such devices independently and confidently²⁴⁻²⁶. Several studies now demonstrate that when combined with high quality content, gains in key areas such as discovery skills, literacy and mathematics, and social-emotional skills are enhanced. For example, young children can quickly learn to conduct complex Internet searches, including developing queries, making judgments about the relevance of the information returned, and collaborating with one another²⁷.

Researchers observe greater collaboration among preschoolers when they use interactive whiteboards (IWBs) than when they use traditional desktop computers (nontouch screen, with mouse and keyboard)²⁸. McManis and colleagues^{29,30} in two separate studies found significant gains in preschoolers' literacy and math skills in classrooms using for children using an IWB and an AIO touchscreen computer preloaded with school-readiness activities. A new study conducted on the PBS Ready to Learn grant program found with the use of media and digital games delivered on IWB and computer platforms, preschoolers showed significant gains in math skills³¹.

Findings related to outcomes for learning from educational content from newer devices such as mobiles and multi-touch surfaces are exciting as well. Research into ebooks with preschoolers finds that the value of looking, listening, and touching while reading come together in a way that positively supports learning in literacy³². A study with iPod touch devices with young children found that children made gains in vocabulary and phonological awareness³³. Multi-touch tables are being confirmed as very conducive to supporting and encouraging positive teacher-to-child and peer-to-peer interactions³⁴.

The Power of Computers to Teach. Computers constitute environments that support teaching and learning by providing effective, supportive experiences³⁵. There are several characteristics of effective computer software that can guide its development, including³⁷:

- Actions and graphics should provide a meaningful context for children;
- Attention should be given to reading level, attention span, clear instructions, and simple choice;
- After adult support, children should be able to use the software independently;
- There should be multiple opportunities for success;
- Feedback should be informative;
- Children should be in control; and
- Software should allow children to create, program, or invent new activities.

Key Message: Technology can positively and strongly support young children's learning and they are developmentally able to benefit from well-designed educational and instructional technology. Both the content and the delivery of the content comprise the educational aspect and are centrally important for positive outcomes to be gained by early learners.

Using the Hatch Technology Products to Help Children Achieve Critical Outcomes

All Hatch technology products are touch-based, making them highly engaging and accessible for early and special needs learners. Each product has a full whitepaper covering its research-basis as well which you can find in the links below.

TeachSmart®: The TeachSmart® Learning System is an interactive, hands-on technology tool which enables teachers of children cognitive ages 3-5 to plan for playful and purposeful activities for children over the entire school year. This learning system offers strategies and activities that reflect the latest scientific research for early literacy, mathematics, science, and social studies concept acquisition in young children. Features include lesson planning tools, custom activity organizer, national and state standards, templates for teachers to create original activities, free play, ideas to extend concepts into the classroom, assessments, and digital portfolios. To learn more visit

<http://hatchearlylearning.com/technology/interactive-whiteboards/teachsmart/>



TeachSmart ELL Spanish®: Equips ELL teachers with 650+ Spanish early learning math and literacy activities for their interactive boards, all correlated to NAEYC standards and the Head Start Framework. TeachSmart ELL Spanish is an add-on to the 1,100+ TeachSmart English activities that enables teachers to search and to toggle between both languages to support specific curriculum requirements. To learn more visit <http://hatchearlylearning.com/technology/interactive-whiteboards/teachsmart/preschool-spanish-ell/>

CoreFocus™: The CoreFocus Learning System is an interactive whiteboard software hands-on technology tool which enables teacher to plan for playful and purposeful activities for children of cognitive ages 3-8 in literacy and mathematics. The software provides a full year of activities mapped to the Common Core and can be used for each child's optimal learning zone. Teachers love the digital portfolios, lesson planning tools, and custom activity organizer. To learn more visit <http://hatchearlylearning.com/technology/interactive-whiteboards/corefocus/>

iStartSmart™: iStartSmart is a research-driven and standards-based instructional technology system designed to increase school readiness skills for preschoolers and is appropriate as well for special needs children with cognitive ages 3-5. The program is driven by adaptive teaching technology that moves children positively through 18 skill development areas known to predict success in kindergarten, developing competency before moving to the next skill area or level. Progress data is summarized in easy-to-understand reports that empower teachers to make informed instructional decisions—leading to improved learning outcomes and efficiencies in periodic data collection. Other features include an area to add activities, free play, and ideas to extend concepts into the classroom. iStartSmart is available on All-in-One desktop computers and on mobile tablets. To learn more visit <http://hatchearlylearning.com/technology/istartsmart-all-in-one/> and <http://hatchearlylearning.com/technology/istartsmart-mobile/>

WePlaySmart®: WePlaySmart by Hatch provides a cooperative learning environment on a multi-touch table for early learners that teaches positive behavior and teamwork. With over 275 interactive activities appropriate for cognitive ages 3-6 in the areas of social competence, emotional skills, behavioral skills, and executive function, the system captures authentic audio of peer conversations so that teachers can review, assess, and report on social-emotional development. To learn more visit <http://hatchearlylearning.com/technology/weplaysmart/>

Computer Learning Centers: For over 20 years, Hatch® has been the leading provider of developmentally appropriate computer solutions for early childhood classrooms across the country. Many early childhood professionals recommend at least two computer learning centers for each classroom. The twin table provides enough room for two complete computer learning centers, including a shared printer. Computers sold separately. To learn more visit <http://hatchearlylearning.com/store/hatchr-all-in-one-desk-twin.html>

Kindergarten Readiness

Research has identified the critical skills preschoolers need to master to be successful in kindergarten^{5, 38}.

Oral Language: It is important for preschoolers to build vocabularies that tell them about the world. They need to learn to use language to make relationships, develop categories, and solve problems.

Phonological Awareness: Using sounds in words to process spoken language is essential for successful reading later on. Young children need to become sensitive to hearing and using sounds in words.

Print Knowledge: Knowing the units of print (letters, word) and being able to connect the letter with the sound it makes forms another important foundation for successful reading; as well as having a basic understanding of book/print concepts.

Math: Young children need to know that numbers show how many, describe order, and are used to measure. For geometry, early concepts mean recognizing shapes, directions, and locations; and their relationships. Classification and

using information to ask and answer questions are early data analyses concepts. Preschoolers can have exposure to algebra as they learn about patterns; and that patterns represent relationships.

Social-Emotional: To engage and participate successfully in learning experiences and to build positive attitudes about school requires young children to have age-appropriate emotional security and social skills. Two key areas are the ability to self-regulate and to relate well with others, both adults and peers. Among others, skills that facilitate success in early schooling include being able to identify emotions accurately in themselves and others, coping skills, pro-social skills for interactions to be positive, managing negative emotions, enjoying learning, and beginning to work independently.

In the following sections we will be taking a closer look at each of these areas.

Social-Emotional Development

Longitudinal studies reinforce the importance of social-emotional skills for adjustment in childhood through adulthood^{39,40}. Self-regulation and the ability to relate well to others shapes a child's capacity to benefit from educational experiences⁴¹. Large scale studies show that a high quality preschool experience fosters the growth of these skills⁴² and evidence is growing that interventions (specific teaching practices and curriculum materials) are effective in promoting skill growth in this area^{43,44}.

Positive social-emotional development facilitates engagement in learning which is important for cognitive growth and academic achievement, facilitates positive peer relationships which is a key developmental milestone; and both, in turn, facilitate adjustment in early childhood. Social-emotional skills buffer children against risk and promote mental health. Children who fail to gain these competencies during preschool more often experience learning problems and academic delays. They enter school at risk for escalating behavior problems, are vulnerable to peer rejection and victimization, and risk adolescent problems of school failure, substance use, depression, and criminal activity.

High-quality emotional support to the child on the part of the teacher is directly and positively related to better social competence for children³. **To promote positive outcomes:**

- Create an environment that promotes every child feeling good about coming to school,
- Design an environment that promotes child engagement,
- Focus on teaching children expectations,
- Teach skills that children can use in place of challenging behaviors, and
- Provide opportunities for children to develop critical social/emotional skills using the backdrop of cognition in a variety of familiar as well as new contexts and environments.

The role of self-control and self-regulation. A number of studies support the notion that self-control is a resource that can be increased through suitable "exercise". Self-control includes emotional as well as behavioral regulation and should increase with age due to the development of the sensory system. Children with more well-developed self-control are empowered, engaged, and enthusiastic at school. Children who have developed self-control find it easier to follow rules and obey the teacher, but self-control is more than being compliant. The term self-regulated can be used to describe learning that is guided by metacognition (thinking about one's thinking), strategic action (planning, monitoring, and evaluating personal progress against a standard), and motivation to learn^{45,46}.

Culminating in a strong sense of self. Providing children with challenging tasks and meaningful activities that can be mastered, and chaperoning these efforts with support and encouragement will help ensure the development of a robust sense of self. Students who have been verbally encouraged to set their own goals experience increases in confidence, competence, and commitment to attain those goals.



Key Message: A high quality preschool experience fosters the growth of key social-emotional skills and specific teaching practices and curriculum materials are effective in promoting skill growth in this area; such as those with a focus on a safe and welcoming environment with meaningful and appropriately challenging learning tasks.

Using the Hatch Products to Help Children Achieve Critical Social-Emotional Outcomes

Hatch has a large selection of products to support early educators in this area. Below is a sample.

WePlaySmart®: WePlaySmart by Hatch provides a cooperative learning environment on a multi-touch table for early learners that teaches positive behavior and teamwork. With over 275 interactive activities appropriate for cognitive ages 3-6 in the areas of social competence, emotional skills, behavioral skills, and executive function, the system captures authentic audio of peer conversations so that teachers can review, assess, and report on social-emotional development. To learn more visit <http://hatchearlylearning.com/technology/weplaysmart/>

Positive Beginnings®: Positive Beginnings is a series of classroom management systems that provide early childhood teachers with the materials necessary for managing their preschool classroom. This proven, research-based system comes with everything teachers need to encourage active participation and organization. Available for children ages 3-5 and children 30-47 months; and available in Spanish. To learn more visit <http://hatchearlylearning.com/store/catalogsearch/result/?q=positive+beginnings>

Sanford's Social Skills HC Software: 6-11 yrs. This software program (CD) combines simulation and interactivity, immediate reinforcement, high interest graphics, narration, and sound effects to teach basic social skills for children ages 6-11 years. Includes 144 page activity book. To learn more visit <http://hatchearlylearning.com/store/sanford-s-social-skills-hc.html>

Physical Health

Research shows that the connection between health and education is close, complex, and interdependent⁴⁷. Better academic outcomes are seen for healthy children compared to those who are less healthy. Further, there is a relationship between a child's success in school and gaining higher education levels and better health as an adult⁴⁸. High quality early childhood programs must attend to the health of the children they serve to reach goals in the cognitive, emotional, and academic areas.

One area in particular that is receiving increased attention is obesity among young children, as its prevalence is increasing to the point that it is now seen as being at epidemic proportions. National Health and Nutrition Survey data show that the number of obese preschool age children is approximately 14%⁴⁹. Being medically overweight is linked to a number of poor school outcomes including lower performance on intelligence and achievement tests, decreased range of interests, less capacity social adaptation capacity, and a greater likelihood of placement in remedial classes⁵⁰⁻⁵⁴. One of the reasons for this includes sleep disturbances, which may factor into impaired attention, learning problems, and school failure^{55,56}. Additionally, overweight children often have poorer attendance in school due to health problems and face risk for behavior problems, low self-esteem, and depression⁵⁷⁻⁵⁹, all of which can negatively impact success in school.

Key Message: Health and school success are intertwined. Attention to healthy practices in early childhood is important to lay the foundation for a child who is ready and able to learn to his or her fullest potential. Children benefit from guided experiences with making and practicing healthy choices and behaviors.

Using the Hatch Products to Help Children Achieve Critical Health Outcomes

Hatch has a large selection of products to support early educators in this area. Below is a sample.



Fit 4 You®: The Hatch Fit 4 You kit includes everything you need to incorporate health and fitness lessons into your curriculum. Designed by early learning experts, dozens of activities and fun, colorful materials help preschool teachers nurture core skill development and promote healthy lifestyles. From school-to-home activities, to lessons that span across all learning centers both inside and outside of the classroom, this kit will get kids moving! The program is dedicated to developing the **whole child**—mind, body & emotion. Physical exercise and nutrition awareness is seamlessly integrated into the curriculum. To learn more visit <http://hatchearlylearning.com/store/fit-4-you-kit.html>

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Emergent Literacy and Language

The formation of reading and writing concepts and skills is a process that is dynamic in the earliest stages of children's literacy development⁴¹. The emergent literacy perspective holds that for young children, reading and writing develop hand-in-hand and are strengthened through experiences that encourage meaningful interaction with written and oral language⁶⁰. Examples are following along in a book as an adult reads aloud or telling a story through a drawing⁶¹. By way of being exposed to written language, prekindergarten children come to have an awareness of print, letter naming, and phonemic awareness. Experiences with oral language allow for the development of listening comprehension, vocabulary, and language competence. A thorough review of the emergent literacy literature suggests that early childhood literacy experiences affect successful reading acquisition, including the importance of children receiving direct instruction⁶².

New findings from a major review of research show that the features of the language environment in early childhood classrooms needs improvement as many teachers' are using language that is limited in many ways³. This includes not having regular and frequent conversations with the children, as well as a lack of using language to make connections between the actions of the teacher and that of the children. In addition, many teachers are not helping children understand clearly that there is a relationship between oral and written language nor the specific connections between units in language such as between letter, rhyme, and sound. Finally, when there is conversation and language, early childhood teachers in general are not using abstract vocabulary and concepts which impedes children from advancing linguistically.

Research findings can inform early childhood classroom instruction in emergent literacy in the following ways⁶³:

- Reading/speaking and writing experiences with print facilitate the development of understanding the purpose, conventions, and functions of print;
- Interacting with others who are competently modeling language (both oral and written) helps children learn how to pay attention to language and apply what they have learned to literacy situations;
- Phonological awareness and letter recognition in particular facilitate beginning reading acquisition by assisting children to develop effective word-recognition strategies (e.g., detecting pronunciations and storing associations in memory); and
- Storybook reading, both the content and the interaction between the teacher and children, has an impact on children's attitudes, knowledge, and strategies toward reading.



The National Early Literacy Panel (NELP)⁶⁴ finds strong predictive evidence for the importance of the following skills for conventional reading and writing success:

- Alphabet knowledge,
- Phonological awareness,
- Rapid naming tasks involving either naming of letters and digits or naming of objects and colors,
- Writing/writing name, and
- Phonological short-term memory.

Key Message: When approaching early childhood instruction in reading, what is recommended (and what many educators likely already practice), is a balanced approach. Such an approach uses language- and literature-rich activities connected with whole language focused on increasing meaning, understanding, and a positive attitude toward language. With clear and direct instruction around skills needed for the development of fluency, and opportunities for children to hear and interact with more advanced vocabulary and connected language being used by their teachers, children move more smoothly along to being proficient in reading.

The National Early Literacy Panel Findings

For your convenience, we have summarized the findings for you⁶⁴.

A Scientific Synthesis of Early Literacy Development and Implications for Intervention. Large-scale studies have shown that young children—those entering kindergarten and first grade—vary greatly in their attainment of the early precursor skills that provide the launching pad for later literacy learning. In 1997, the U.S. Congress asked that a review of research be conducted to determine what could be done to improve reading and writing achievement. The resulting “Report of the National Reading Panel: Teaching Children to Read” has been influential in helping to guide reading-education policy and practice in the United States. However, that report did not examine the implications of instructional practices used with children from birth through age 5. To address this gap in the knowledge base, the National Early Literacy Panel (NELP) was convened.

Key Findings of the National Early Literacy Panel

A. Identification of the Domain of Early Literacy Skills. Conventional reading and writing skills that are developed in the years from birth to age 5 have a clear and consistently strong relationship with later conventional literacy skills. Additionally, six areas representing early literacy skills or precursor literacy skills had medium to large predictive relationships with later measures of literacy development. These not only correlated with later literacy as shown by data drawn from multiple studies with large numbers of children, but also maintained their predictive power even when the role of other variables, such as IQ or socioeconomic status (SES), were accounted for. These six areas include:

- Alphabet Knowledge (AK): Knowledge of the names and sounds associated with printed letters.
- Phonological Awareness (PA): Ability to detect, manipulate, or analyze auditory aspects of spoken language (including the ability to distinguish or segment words, syllables, or phonemes), independent of meaning.
- Rapid Automatic Naming (RAN) of letters or digits: The ability to rapidly name a sequence of random letters or digits.
- RAN of objects or colors: The ability to rapidly name a sequence of repeating random sets of pictures of objects (e.g., “car,” “tree,” “house,” “man”) or colors.
- Writing or Writing name: The ability to write letters in isolation on request or to write one’s own name.
- Phonological Memory: The ability to remember spoken information for a short period of time.

B. Instructional Practices that Enhance Early Literacy Skills. The panel also set out to identify studies that employed experimental or quasi-experimental methods to determine the effectiveness of instructional strategies, programs, or practices in imparting conventional literacy skills or any of these precursor skills to young children. These included:

- Code-focused interventions: Interventions designed to teach children skills related to cracking the alphabetic code. Most code-focused interventions included PA instruction.
- Shared-reading interventions: Interventions involving reading books to children. These interventions included studies of simple shared reading and those that encouraged various forms of reader-child interactions around the material being read.
- Parent and home programs: Interventions using parents as agents of intervention. For example, teaching parents instructional techniques to use with their children at home to stimulate their linguistic or cognitive development.
- Preschool and kindergarten programs: Studies evaluating any aspect of a preschool or kindergarten program, such as effects of educational programs, curricula, or policies.
- Language-enhancement interventions: Studies examining the effectiveness of an instructional effort aimed at improving young children’s language development.

The code-focused instructional efforts reported statistically significant and moderate to large effects across a broad spectrum of early literacy outcomes. Code-focused interventions consistently demonstrated positive effects directly on children’s conventional literacy skills. Book-sharing interventions produced statistically significant and moderate-sized effects on children’s print knowledge and oral language skills, and the home and parent programs yielded statistically significant and moderate to large effects on children’s oral language skills and general cognitive abilities. Studies of preschool and kindergarten programs produced significant and moderate to large effects on spelling and reading readiness. Finally, language-enhancement interventions were successful at increasing children’s oral language skills to a large and statistically significant degree.

Together, these findings strongly suggest that there are many things that parents and schools can do to improve the literacy development of their young children and that different approaches influence the development of a different pattern of essential skills. *It should be noted that the interventions that produced large and positive effects on children’s code-related skills and conventional literacy skills were usually conducted as one-on-one or small-group instructional activities.* These activities tended to be teacher-directed and focused on helping children learn skills by engaging in the use of those skills. Almost all of the code-focused interventions included some form of PA intervention. These PA activities generally required children to detect or manipulate (e.g., delete or blend) small units of sounds in words. Teaching children about the alphabet (e.g., letter names or letter sounds) or simple phonics tasks (e.g., blending letter sounds to make words) seemed to enhance the effects of PA training.

National Early Literacy Panel. (2009). *Developing Early Literacy: Report of the National Early Literacy Panel*. Washington, DC: National Institute for Literacy. http://www.nap.edu/catalog.php?record_id=12519#toc

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CoreFocus™: The CoreFocus Learning System is an interactive whiteboard software hands-on technology tool which enables teacher to plan for playful and purposeful activities for children of cognitive ages 3-8 in literacy and mathematics. The software provides a full year of activities mapped to the Common Core and can be used for each child's optimal learning zone. Teachers love the digital portfolios, lesson planning tools, and custom activity organizer. To learn more visit <http://hatchearlylearning.com/technology/interactive-whiteboards/corefocus/>

iStartSmart™: iStartSmart is a research-driven and standards-based instructional technology system designed to increase school readiness skills for preschoolers and is appropriate as well for special needs children with cognitive ages 3-5. The program is driven by adaptive teaching technology that moves children positively through 18 skill development areas known to predict success in kindergarten, developing competency before moving to the next skill area or level. Progress data is summarized in easy-to-understand reports that empower teachers to make informed instructional decisions—leading to improved learning outcomes and efficiencies in periodic data collection. Other features include an area to add activities, free play, and ideas to extend concepts into the classroom. iStartSmart is available on All-in-One desktop computers and on mobile tablets. To learn more visit <http://hatchearlylearning.com/technology/istartsmart-all-in-one/> and <http://hatchearlylearning.com/technology/istartsmart-mobile/>

Journeys Literacy: Journeys into Early Literacy® is a complete early education literacy software program designed to build upon and extend children's knowledge of letters, words and the processes they use in learning to read. To learn more visit <http://hatchearlylearning.com/store/journey-into-lit-w-o-manips.html>

Lending Libraries: The Hatch Lending Library for children ages 3-8 is a blend of traditional and contemporary picture books for young children and their families. Each book is accompanied by a laminated activity card that prompts families to talk with their child about the story, as well as engage in fun learning activities. The activity cards explain to both parents and teachers how crucial pre-reading skills such as vocabulary development, alphabet knowledge and phonemic awareness are developed within each book. To learn more visit <http://hatchearlylearning.com/store/hatchr-lending-libraries.html>

Instant Center-Literacy Knowledge & Skills: Ensure your students are using the right tools to meet school readiness standards in Literacy Knowledge & Skills. This collection includes books and toys specifically designed to address book appreciation, phonological awareness, alphabet knowledge, print concepts & conventions, and early writing. To learn more visit <http://hatchearlylearning.com/store/literacy-knowledge-skills.html>

Instant Center-Language Development: Ensure your students are using the right tools to meet school readiness standards in Receptive and Expressive Language. This complete collection provides your students with fun and interactive ways to learn. To learn more visit <http://hatchearlylearning.com/store/language-development.html>

Emergent Mathematics

During early childhood, children pay attention to dimensions of their environment that are mathematical in nature and make use of a variety of mathematical concepts to make sense of their world. Young children sort, count, find patterns, compare quantities, and move through space. Young children also exhibit a noteworthy capacity to formulate, represent, and solve simple mathematical problems and to reason and explain their mathematical activities. Wanting to quantify their world through the lens of mathematics appears to come naturally⁶⁵. These activities are the beginnings of foundational skills that will help children successfully learn math in school^{66,67}.

According to the Institute of Educational Sciences³, “children’s initial skill levels predict their later learning in many domains, but the relation between early math knowledge and future math achievement is particularly strong and persistent; in fact, it is roughly twice as strong as the relation between early and later reading achievement, which in turn is stronger than the relation in other domains (such as attentional control and emotional regulation).” Facilitating preschoolers’ engagement with math concepts is encouraged by many researchers and educators through activities that are hands-on⁶⁸, natural⁶⁹, have meaning for children^{70,71}, and come from everyday life⁷². Instead of using drill and rote to teach skills, early childhood educators can offer experiences that have much depth and present opportunities that are appropriate in their developmental sequence through play⁷³.

Keeping in mind that young children may need an extended time period of instruction to learn certain core math concepts³, some of the key practices the National Council of Teachers of Mathematics and the National Association for the Education of Young Children⁷⁵ recommend are:

- Build on children’s natural interest, experiences, and knowledge in math;
- Base mathematics curriculum and teaching practices on knowledge of young children’s developmental levels;
- Ensure the curriculum follows the sequence of important math concepts;
- Provide for children’s full and continued interaction with key math ideas;
- Teach math through a range of strategies, including play; and
- Continually assess.

An extensive Educator’s Guide with supporting materials has recently been released on What Works Clearinghouse framed around the following instructional recommendations demonstrated to have positive impacts⁷⁶:

- Teach number and operations; and geometry, patterns, measurement, and data analysis using a developmental progression.
- Use progress monitoring to ensure that math instruction builds on what each child knows.
- Teach children to view and describe their world mathematically.
- Dedicate time each day to teaching math and integrate math instruction throughout the school day.

A landmark report from the National Research Council Committee on Early Childhood Mathematics found that virtually all young children have the capability to learn and become competent in mathematics⁷⁷. In fact, well before first grade, children can learn the ideas and skills that support later, more complex mathematics understanding. There is expert consensus that two areas of mathematics are particularly important for young children to learn: (1) number, which includes whole number, operations, and relations, and (2) geometry, spatial thinking, and measurement. However, the findings reveal that time spent in mathematics instruction is extremely low in early childhood settings. IES-supported research confirms with more evidence of very little instruction both in terms of time and in terms of needed skills in mathematics being carried out in early education classrooms. Instruction is limited by most preschool teachers to naming common shapes and counting up to small numbers (for example 10 or 20). Their findings illuminate that such a narrow focus is much more constrained than what preschoolers are capable of learning about math³.

Putting concepts forward in a developmentally appropriate sequence gives children the opportunity to build on their present understanding and knowledge, and allows them to apply what they have learned. The general order of introducing math concepts in such a developmentally appropriate sequence is presented below⁷⁸:

- Free exploration of materials (becoming aware of and developing vocabulary for attributes and properties of materials),
- Spatial relationships (vocabulary for position and direction),
- Classification (sorting items into a specified position or set based on attributes),
- Patterning (arranging items in a specific sequence based on attributes),
- One-to-one correspondence (matching items from sets into a one-to-one relationship) and set comparison,



- Ordering (arranging items by an attribute of size), and
- Numeration (understanding the concept of number).

Summary of the National Research Council's Mathematics Learning in Early Childhood Findings

A Scientific Synthesis of Early Math Development and Implications for Intervention. Mathematics education has risen to the top of the national policy agenda as part of the need to improve the technical and scientific literacy of the American public. There is particular concern about the chronically low mathematics and science performance of economically disadvantaged students and the lack of diversity in the science and technical workforce. Particularly alarming is that such disparities exist in the earliest years of schooling and even before school entry. Recognizing the increasing importance of mathematics and encouraged by a decade of success in improving early literacy, the Mathematical Sciences Education Board of the Center for Education at the National Research Council established the Committee on Early Childhood Mathematics. The majority of support for this study was provided by the U.S. Department of Health and Human Services, ACF, and Office of Head Start among other sponsors.

Key Findings of the National Research Council

A. Identification of the Domain of Early Math Skills. The committee found that virtually all young children have the capability to learn and become competent in mathematics. In fact, well before first grade, children can learn the ideas and skills that support later, more complex mathematics understanding. There is expert consensus that two areas of mathematics are particularly important for young children to learn: (1) number, which includes whole number, operations, and relations, and (2) geometry, spatial thinking, and measurement.

B. Instructional Practices That Enhance Early Math Skills. For most children the potential to learn mathematics in the early years of school is not currently realized. This stems from a lack of opportunities to learn mathematics either in early childhood settings or through everyday experiences in homes and in communities. This is particularly the case for economically disadvantaged children, who start out behind in mathematics and will remain so without extensive, high-quality early mathematics instruction. The report informs the field that results from two robust studies indicate that children in state Pre-K programs spend a great deal of time NOT engaged in any type of instructional activity. The study illustrated that during the preschool day, the average student spent 44% of the time engaged in non-curriculum activities (literacy, mathematics, science, social studies, etc.) What are children doing? In preschool classrooms, much of the time (22%) was spent engaged in routine activities such as transitioning, waiting in line, or washing hands. Pre-K children in the NCEDL studies were exposed to mathematics content in only 6% of the classrooms observations. In the state-funded Pre-K classrooms observed in the NCEDL study, mathematics was often taught in conjunction with art, music, and fine motor activities. The committee thinks that the integration of mathematics with other activities may or may not be effective in supporting children's mathematics knowledge development. In an observational study of New Jersey preschools, it was found to provide little support for children's mathematics skill development and seldom used mathematics terminology. Of particular interest, is that over 40% of the classrooms in the study were rated good to excellent quality on the ECERS-R measure of the environmental quality of early childhood programs. Apparently, mathematics teaching and learning is relatively rare even in classrooms that are otherwise judged to be high quality. Many widely used early childhood curricula do not provide sufficient guidance on mathematics pedagogy or content. When early childhood classrooms do have mathematics activities, they are often presented as part of an integrated or embedded curriculum, in which the teaching of mathematics is secondary to other learning goals. Emerging research indicates, however, that learning experiences in which mathematics is a supplementary activity rather than the primary focus are less effective in promoting children's mathematics learning than experiences in which mathematics is the primary goal.



National Research Council. *Mathematics Learning in Early Childhood: Paths Toward Excellence and Equity*. The National Academies Press, 2009. http://www.nap.edu/catalog.php?record_id=12519#toc

Key Message: Young children are very interested in mathematics and are capable of fairly advanced learning in this area. Unfortunately, in many cases in early childhood settings, children get very little mathematics instruction and what they receive is often very low level. While basic skills are absolutely essential, it is important to move beyond these, and the most successful approach is to help children think about their world mathematically while offering activities from their everyday lives to encourage context and relatedness.

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STEM Kit - It's All in the Box! The It's All in the Box! kit developed by Hatch is part of the Science, Technology, Engineering and Mathematics (STEM) series. This kit focuses on 2-D and 3-D shapes, weight, volume, and construction for ages 3 & Up. A scaffolded Teacher's Activity Guide is provided with research-based lessons that are aligned with national standards. To learn more visit <http://hatchearlylearning.com/store/it-s-all-in-the-box-stem-kit.html>

STEM Kit - Up, Over and On We Go! The Up, Over and On We Go! Kit developed by Hatch is part of the Science, Technology, Engineering and Mathematics (STEM) series and is focused on Civil Engineering for ages 3 & up. The kit includes a scaffolded Teacher's Activity Guide with lessons about ramps, bridges and paths specifically. To learn more visit <http://hatchearlylearning.com/store/stem-kit-79.html>

Instant Center-Mathematics Knowledge & Skills: Ensure your students are using the right tools to meet school readiness standards in Mathematics Knowledge & Skills. This collection includes books and toys specifically designed to address



patterns, geometry, spatial reasoning, measurement & comparisons, and reasoning & problem-solving. To learn more visit <http://hatchearlylearning.com/store/mathematics-knowledge-skills.html>

Instant Center- Logic and Reasoning: Ensure your students are using the right tools to meet school readiness standards in Logic and Reasoning. This complete collection provides your students with fun and interactive ways to learn about Reasoning & Problem Solving and Symbolic Representation. To learn more visit <http://hatchearlylearning.com/store/logic-reasoning.html>

Math Big Book Collection With Read Aloud Labels: Our Hatch exclusive early math big books feature interactive rhyming text and poster-size real-life photos for children 4-8. All 6 books are accompanied by a customized Read Aloud Label and a teacher guide that provides background information, cross-curricular activities, hands-on experiments and home/school connections. To learn more visit <http://hatchearlylearning.com/store/math-big-book-collection-with-read-aloud-labels.html>

Emergent Science

For preschool children, science comes naturally. Young children are extremely interested in learning about the world around them. Learning best from experiences that are personal, they are active and intrinsically motivated^{79,80}. Their building of knowledge happens most effectively when they are allowed to have choices and participate with other people in activities that cultivate solving problems through experimentation⁸¹⁻⁸⁴. Both the National Science Education Standards⁸⁵ and Benchmarks for Science Literacy⁸⁶ recommend that the approach to science with young children be action-oriented and inquiry-based⁸⁷.

Recent findings from IES show that compared to the teaching of either literacy or mathematics, teachers spend much far less time teaching science concepts in the early grades³. During the early childhood period, teachers focusing on process and inquiry (such as through posing questions that guide children in exploring ideas to gain knowledge; notably with the paired robust use of effective literacy practices) is actually more important than preschoolers knowing a large number of science facts (which is more appropriate during early elementary school)^{88,89}. The added benefit is such an approach facilitates motivation and feelings of competence by children that they can learn science³.

The following represent process areas and their general sequence in science exploration⁸⁹:

1. Questioning: Posing questions about objects, events, or phenomena. Appropriate questions often begin with "What causes...?" "How does...?" "What makes...?" "What if...?" "Why...?"
2. Hypothesizing: Based on children's experience, developing possible explanations and forming an initial explanation or statement that can be tested. Promote explanations with "I think..." "What do you think...?" "Why do you think...?"
3. Planning: Conceiving investigations to test a hypothesis and constructing children's own investigation using methods to collect information. "How can we find out?"
4. Predicting: Applying ideas or evidence to predict and state a future outcome based on a pattern of evidence or an explanation. Often involves an action and a reaction or an if-then statement. A prediction is not a wild guess and children may have several predictions. "What do you think will happen when...?" "If we do..., then what will happen?"
5. Investigating: Conducting a planned "experiment" to test the children's ideas based upon a hypothesis. Investigations make use of a majority of the prior process skills.
6. Interpreting: Considering evidence, evaluating, and drawing a conclusion by looking at the "data" or what happened to find a pattern or other meaning in what children saw. This lets them answer the questions "What did you find out?" and "What did you see/hear/etc.?"



7. Communicating: Presenting reports, using supporting sources, and representing observations, ideas, conclusions, or models by talking, writing, drawing, etc. "Can you tell me what happened?" "Can you draw a picture of what you saw?"
8. Relating and Applying: Connecting knowledge to other experiences. Relating makes connections to similar concepts and applying uses the knowledge obtained to help solve a challenge. "Where else do you see...?" "What if we did this with...?"

Key Message: To provide an environment in the early childhood classroom that supports science learning for young children, provide a selection of appealing materials for exploration and manipulation, adequate time for children to formulate and test their ideas, and a social atmosphere that conveys that inquiry-based approaches such as questioning and experimenting are as important as knowing the correct answers.

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discover! Science: Hatch Early Education Experts teamed up with scientists at The Children's Learning Institute at the University of Texas Health Science Center to create discover! Science™, a complete science experiment kit for early learners. All materials needed for the science projects are included, along with instructions and books for reference. discover! Science provides teachers with appropriate, easy-to-implement activities for the entire class or small groups. discover! Science turns the classroom into a fun filled science lab. Activities support state pre-Kindergarten guidelines, EOG and Head Start Outcomes. Prepare young learners for kindergarten and beyond with easy-to-implement science projects. To learn more visit <http://hatchearlylearning.com/store/discover-sciencetm.html>

STEM Kit - HANDy Engineering Robotics Kit with Cubelets: The HANDy Engineering - Robotics Kit and Cubelets extension addresses a combination of technology and engineering skills, specifically an introduction to robotics and other elements of STEM. This scaffold kit includes a Quick Reference Guide that starts with activities that focus on the simplest form of technology...our hands! We explore advances that have been made to help make our daily jobs and tasks quicker and easier and as the activities increase in difficulty, as do the explorations of these advances! the kit also includes national standards such as NAEYC, Common Core, and the Federal STEM Initiatives, as well as alignments with Teaching Strategies GOLD. To learn more visit <http://hatchearlylearning.com/store/stem1-kit-for-prek-and-kindergarten.html>

Social Studies

Learning about the social world and their place in it is an activity of much interest to children. Social studies as the area of how people live, work, get along with one another, find solutions to problems, and influence and are influenced by their social and physical environment, begins with children developing relationships with the important people in their lives, learning to communicate, and much exploration of their immediate surroundings. Eventually children understand more about their larger community, then gradually more about their expanding community, and in due course come to view themselves as citizens in a society. As they embark on this journey, young children are developing a beginning awareness that can be connected to the main social studies content areas such as geography, civics, economics, and history^{90,91}. The



National Council for Social Studies⁹² has identified the main goal of the study of the social sciences as supporting young children in developing the skills to make decisions for the good of the public. Some of the focus of social studies now must incorporate living in societies that are both culturally diverse and interdependent across the world.

When working with preschoolers in the area of social studies, some key considerations about three- to five-year-olds will help teachers as they implement lessons. Preschoolers are characterized by⁹¹:

- Seeing the world mainly from their own point of view;
- Living in the present and understanding time in a narrow sense, such as today, yesterday, tomorrow, this morning, etc.;
- Developing a fuller understanding of new concepts when given opportunities to engage in socially rich dramatic play;
- Generalizing, often from one experience, by seeing connections between events and objects;
- Learning most effectively when experiences are meaningful and relevant to their own lives;
- Gaining a sense of fairness and rules; and
- Over time, developing the skills to work cooperatively with others.

Important in the teaching of social studies is to address both content and process (process being action-oriented strategies). The processes that research has found to be most effective for young children work very well within the classroom as a representation of a community^{90,92}, and can easily be connected to the content so that “big ideas” are used to make meaningful connections for children and deepen their understanding of their social environment⁹⁰.

Best practices for teaching Social Studies^{90,93}:

- Build on what children currently know. For instance, after studying neighborhood and community, move on to the home state.
- Develop concepts and processes of social studies instead of presenting facts in isolation. For example, create visual maps illustrating the classroom, the school, and/or community.
- Offer hands-on activities. Let children draw a timeline of when each of them was born or make a chart to show how many brothers and sisters each child has.
- Draw on relevant social studies all through the year. Have discussions with the children about class problems, revising class rules as a result, or have children think about the concept of scarcity with respect to items or activities from which they want to choose.
- Make the most of child interests. Reflect on why the outdoor city pool is closed to swimmers in the winter or what makes an airplane stay in the sky.

Key Message: Children’s active participation in society, both in the present and as adults, is supported as they are exposed to social studies. Experiences and situations that are relevant to children allow an effective mechanism for learning about social studies in the early childhood setting. In our increasingly culturally diverse and interdependent world, attention to these is important for children as well.

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concepts into the classroom, assessments, and digital portfolios. To learn more visit <http://hatchearlylearning.com/technology/interactive-whiteboards/teachsmart/>

Wonder World Map: Explore the world hands-on with our giant map and manipulatives. Introduce young students to the natural world and world cultures in hands-on activities. Invites tactile explorations of the world as children fill the map with included felt animals, landmarks and vehicles, plus continent, country, and topography labels. Features embroidered continents and oceans. To learn more visit <http://hatchearlylearning.com/store/shop-all/wonder-world-map.html>

Multicultural Classroom Packages: Hatch offers a number of multicultural classroom packages to introduce and extend children’s understanding of cultural diversity. **The Developing Awareness Package** includes multi-ethnic costumes, manipulatives, books, CDs, and instruments (<http://hatchearlylearning.com/store/developing-awareness-multicultural-classroom-package.html>). **The Global Citizen Multicultural Classroom Package** integrates essential resources, such as books and puzzles, with diversified learning components including imaginative art kits, costumes, and instruments (<http://hatchearlylearning.com/store/gold-diversity-enhancement-pkg.html>).

Teaching Young English Language Learners

The Vital Role of Oral Language Proficiency. A common thread that unifies the research on ELL children and monolingual English-speaking children is the emphasis on the development of oral language proficiency as a necessary prerequisite for later literacy⁹⁴. A well-accepted finding at this point is that children taught in English-only classrooms or those transitioned to English instruction before they can fully demonstrate well-established oral language abilities in their own language and have achieved some degree of English oral proficiency, do not progress as well as those who have the chance to learn and become competent and proficient through and in two languages^{95,96}.

Language of Instruction. The Report of the National Literacy Panel on Language Minority Children and Youth found that “English language learners may learn to read best if taught both in their native language and English from early in the process of formal schooling. Rather than confusing children, as some have feared, reading instruction in a familiar language may serve as a bridge to success in English because decoding, sound blending, and generic comprehension strategies clearly transfer between languages that use phonetic orthographies, such as Spanish, French, and English”⁹⁷.

Transfer of Early Literacy Skills across Languages. The potential for transfer, that is, the ability to apply one’s previous learning to a new skill, is crucial when determining the language of instruction. (*L1=1st language/home language/native language; L2=2nd language/language of school). Recent research on the transfer of preschool literacy skills from Spanish to English supports the transfer hypothesis, where “building on a child’s language abilities in his or her L1 will not only help the child fully master that language, but provide him or her with the tools to deconstruct the L2. Early development of language skills, such as semantics, syntax, narrative discourse, and morphology, as well as phonological awareness, will provide the child with a ‘meta’ understanding of language that he or she can apply to language development and literacy skills in the L2”⁹⁸.

Best Practices for Teaching Young ELL Children

Literacy. The following are instructional approaches recommended based on a review of three national data sets⁹⁹.

- Use the children’s main language in a strategic manner and build upon home language skills;
- Have expectations, instruction, and routines that are consistent;
- Provide extensions of explanations and opportunities for practice;
- Use visual cues and physical gestures;
- Highlight the similarities/differences between English and the native/home language;
- Restate children’s language and encourage them to expand on that language; and
- Frequently assess comprehension.



Mathematics. An incremental developmental process in instruction is recommended for ELL children by the National Council of Teachers of Mathematics (NCTM)¹⁰⁰.

1. Build a conceptual understanding of mathematics by starting each new concept with concrete examples and experiences.
2. Provide opportunities for children to make connections among concrete experiences, semi-concrete graphical depiction, abstract symbolic representations, verbal language, and written expression to allow them to construct a comprehensive understanding of the new math concept(s).

As mathematics can be taught using many modalities, it has a distinct advantage for learning opportunities for children. In addition to verbal language, math ideas can be expressed through graphical depiction, symbolic representations, and the manipulation of concrete objects, all of which are fairly free of spoken language. This can contribute to ELL children being able to understand new concepts in math. However, it is also important to take into account the linguistic complexity of the language used in math instruction and the language proficiency of the children. This is because if new concepts are introduced in a language that is not familiar, the children then must grapple with two unknowns: the language and the concept, which makes learning daunting¹⁰¹. Teachers must control and monitor that children are progressing in both math language and concepts. Further, the National Research Council Committee on Early Childhood Mathematics points out that operations situations (e.g., addition and subtraction) and the word problems that describe them, allow excellent opportunities for ELL students to learn language, including integrating art, language practice, and pretend play to help generalize their budding knowledge about mathematics⁷⁷.

Progress Monitoring and Assessment. There are many drawbacks to current standardized assessment measures all around for ELL children. Two of the most widespread are measures having varying levels of attention to ensuring comparability across languages. The second is the norm group not matching or including too few children similar to those being assessed. To compensate for these issues, researchers recommend the use of multiple measures that may include standardized tests and curriculum-embedded assessments in addition to narrative language samples and observation of children's language usage in natural settings^{97,102,103}.

Two types of progress monitoring and assessment being recommended by research are:

- The use of language samples, particularly storytelling, is one promising alternative approach to assessment as it matches well with showing a child's ability to comprehend and produce both oral and written narrative structure (e.g., introduction, character development, referencing)¹⁰⁴.
- Equally exciting is using dynamic assessment in order to reduce test bias because it focuses on learning potential^{105/87(Pena et al 2001)}. Major characteristics of the dynamic assessment model include a test-teach-retest format and a focus on the learning process, particularly strategies related to problem solving that underpin the ability to be successful during test taking. Much of the rationale behind this approach is based on Vygotsky's theory of the zone of proximal learning and scaffolding⁶.

Key Message: Essential metalinguistic skills can be gained by young children through learning more than one language, they are quite capable of learning early language and literacy skills in two languages, and many early language and literacy skills learned in L1 positively factor into English language/literacy and mathematics development. However, many ELL preschoolers, especially if they are in low-income families, are already behind when they enter early childhood programs, and continue to fall behind. The good news is that there is a growing body of research-based best practices that have demonstrated positive results for these tenuous learners, such as using the child's home language in a strategic manner, ample practice, and explicitly connecting concrete to abstract concepts.

Using the Hatch Products to Help ELL Children Achieve Critical Language & Mathematics Outcomes



TeachSmart ELL Spanish®: Equips ELL teachers with 650+ Spanish early learning math and literacy activities for their interactive boards, all correlated to NAEYC standards and the Head Start Framework. TeachSmart ELL Spanish is an add-on to the 1,100+ TeachSmart English activities that enables teachers to search and to toggle between both languages to support specific curriculum requirements. To learn more visit <http://hatchearlylearning.com/technology/interactive-whiteboards/teachsmart/preschool-spanish-ell/>

Bilingual Learning Kit: This Hatch exclusive kit designed for children 3 years and up includes a bilingual monthly pocket chart with 31 date cards, seven day-of-the-week cards, 12 month cards and a teaching guide; two alphabet pocket charts in English and Spanish; Roylco® home classroom and city English/Spanish cards; and two English/Spanish bilingual CDs. The CDs include lyrics and activity books. To learn more visit <http://hatchearlylearning.com/store/bilingual-learning-kit.html>

ELL Classroom Essentials Bundle (Grades PreK – 2): This ELL Enrichment Bundle for PreK to 2nd grade equips teachers with all the tools needed to help early learners master math and literacy skills. Instructional ELL programs work when they provide opportunities for students to develop in their language first. Hatch is committed to producing products that help these students transition to English successfully and meet school readiness standards. To learn more visit <http://hatchearlylearning.com/store/ell-prek2-collection.html>

Lending Libraries: The Hatch Lending Library for children ages 3-8 is a blend of traditional and contemporary picture books for young children and their families. Each book is accompanied by a laminated activity card that prompts families to talk with their child about the story, as well as engage in fun learning activities. The activity cards explain to both parents and teachers how crucial pre-reading skills such as vocabulary development, alphabet knowledge and phonemic awareness are developed within each book. The Spanish version has Spanish books and bilingual activity cards. To learn more visit <http://hatchearlylearning.com/store/hatchr-lending-libraries.html>

Teaching Special Needs Learners

Technology and Children with Disabilities. Young special needs children who have been unsuccessful in interacting with their environment through traditional methods can often experience immediate success through access to appropriate technology. As children with disabilities experience these successes, their self-esteem improves and inclusion efforts are less challenging.

The following represent specific areas in which special needs children can benefit⁸⁹⁻⁹²:

The Technology-Related Assistance for Individuals with Disabilities Act. Attention to the purpose of P.L. 100-407, The Technology-Related Assistance for Individuals with Disabilities Act of 1988 is key¹⁰⁶. “The primary purpose of this Act is to assist states in developing comprehensive, consumer-oriented programs of technology-related assistance, and to increase the availability of assistive technology to individuals with disabilities and their families. The Act was reauthorized in 1994, by P.L. 103-218. The reauthorization requires the development of a national classification system for assistive technology devices and services. “Assistive technology device” is defined by the Act as “any item, piece of equipment, or product system whether acquired off the shelf, modified or customized that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.”

Universal Design for Learning. Touch driven technology devices for example are designed to engage a wide variety of children in the learning process by supporting the principles of universal design for learning. Larger devices in particular such as interactive whiteboards give teachers multiple ways to represent information through text and images that are interactive with sound and video. There are multiple options for engaging with material and information, as children can use their finger, pen tools, or other objects such as a tennis ball. Touch devices additionally give children an instant and tactile connection, thereby increasing their engagement¹⁰⁷.

Fine motor delay. Special needs children with fine-motor development delays can access an interactive whiteboard and touch screen computers in multiple ways by using special pens, a finger or fist, or any object, such as a tennis ball. Those who cannot type or write benefit from lessons and participate in activities using drag-and-drop techniques. Even students with severely limited movement can operate touch devices. The sense of accomplishment and mastery for students with physical challenges boosts self-esteem while increasing their engagement in the lesson. For example, "...pupils with special educational needs, are highly motivated by being able to demonstrate their skills and knowledge with the tapping and dragging facilities of the interactive whiteboard"¹⁰⁸.

Visually challenged. The size of the images displayed on the whiteboard or other large touch surface make it ideal for children who are visually challenged, and allows teachers to adapt material for these children. For example, text and graphics can be resized, and brightness or contrast can be adjusted. Writing on an interactive whiteboard for instance is facilitated for these children because the brightness and scale is greater than that of a pen and paper or traditional chalkboard. When playing videos, the image is enlarged so children can view detail not visible on a smaller computer screen. And of course interactive devices take it a step further as children are also able to interact with objects on-screen and participate more fully in the activity¹⁰⁷.

Hearing challenged. Interactive touch devices have been found to be very useful when teaching deaf or hard of hearing children because the finger-touch capabilities allow their hands to be free of pen tools, which can interfere with signing. Additionally, holding the attention of children with the materials on the devices with large screens limits the need for children to have to look down (using written material on a table), and teachers to have to regain their attention and focus. This increases the opportunities for communication between teachers and students¹⁰⁹.

Mentally and behaviorally challenged. Keeping children focused who have full autism, Asperger's syndrome, attention-deficit disorder and other mental or behavioral challenges can be very challenging for teachers. Because interactive touch devices provide a stimulating focal point for lessons, it can more easily capture the interest of the children, provide positive reinforcement, give children different sensory experiences to allow information to be processed, and support new ways to share information for those children with expressive communication problems¹⁰⁷.

Interactive whiteboards and IEPs. Interactive whiteboards in particular with digital portfolio support allow an excellent means to design and review Individual Education Plans (IEPs), as educators, specialists, administrators, and parents can see, often in real time, the work of a child and therefore their status with respect to their short-term and long-term goals¹⁰⁷.

Content. As with all devices, appropriate content on interactive touch technology devices is paramount to success. Content must be able to address all areas including physical, social-emotional, and cognitive. The use of scaffolding, both teacher driven and software driven (intuitive); capability to be customized to the individual learner; and the presence of a strong progress monitoring component are especially important for special needs learners and their teachers.

Key Message: Children with special needs can experience success in school if their learning environments are adapted to their needs and goals. Technology can greatly facilitate their ability to participate in learning and appropriate content can engage and inspire them to progress.

Using the Hatch Products to Help Special Needs Children Achieve Critical Outcomes

TeachSmart®: The TeachSmart® Learning System is an interactive, hands-on technology tool which enables teachers of children cognitive ages 3-5 to plan for playful and purposeful activities for children over the entire school year. This learning system offers strategies and activities that reflect the latest scientific research for early literacy, mathematics, science, and social studies concept acquisition in young children. Features include lesson planning tools, custom activity organizer, national and state standards, templates for teachers to create original activities, free play, ideas to extend concepts into the classroom, assessments, and digital portfolios. To learn more visit

<http://hatchearlylearning.com/technology/interactive-whiteboards/teachsmart/>



CoreFocus™: The CoreFocus Learning System is an interactive whiteboard software hands-on technology tool which enables teacher to plan for playful and purposeful activities for children of cognitive ages 3-8 in literacy and mathematics. The software provides a full year of activities mapped to the Common Core and can be used for each child's optimal learning zone. Teachers love the digital portfolios, lesson planning tools, and custom activity organizer. To learn more visit <http://hatchearlylearning.com/technology/interactive-whiteboards/corefocus/>

iStartSmart™: iStartSmart is a research-driven and standards-based instructional technology system designed to increase school readiness skills for preschoolers and is appropriate as well for special needs children with cognitive ages 3-5. The program is driven by adaptive teaching technology that moves children positively through 18 skill development areas known to predict success in kindergarten, developing competency before moving to the next skill area or level. Progress data is summarized in easy-to-understand reports that empower teachers to make informed instructional decisions—leading to improved learning outcomes and efficiencies in periodic data collection. Other features include an area to add activities, free play, and ideas to extend concepts into the classroom. iStartSmart is available on All-in-One desktop computers and on mobile tablets. To learn more visit <http://hatchearlylearning.com/technology/istartsmart-all-in-one/> and <http://hatchearlylearning.com/technology/istartsmart-mobile/>

WePlaySmart®: WePlaySmart by Hatch provides a cooperative learning environment on a multi-touch table for early learners that teaches positive behavior and teamwork. With over 275 interactive activities appropriate for cognitive ages 3-6 in the areas of social competence, emotional skills, behavioral skills, and executive function, the system captures authentic audio of peer conversations so that teachers can review, assess, and report on social-emotional development. To learn more visit <http://hatchearlylearning.com/technology/weplaysmart/>

Early Childhood Diverse Abilities/Inclusion: Introduce children 3-6 to the abilities of people with special needs such as Down's syndrome, ADHD, autism, blindness, deafness and speech issues. Each of the 9 books includes a customized Read Aloud Label. To learn more visit <http://hatchearlylearning.com/store/early-childhood-diverse-abilities-inclusion.html>

ADA Student Desk: The ADA Student desk is designed to meet the special needs of students with disabilities. A hand crank on the underside of the work surface allows easy height adjustment allowing the desk to be fitted to the individual student. To learn more visit <http://hatchearlylearning.com/store/30-d-ada-student-desk.html>

Progress Monitoring in Early Childhood

Assessing and teaching are highly and necessarily connected. When children are assessed as part of the teaching-learning process, teachers are able to learn what each child can do, and determine what he or she is next ready to learn¹¹⁰. Similar to the purpose of scaffolding discussed earlier, early childhood teachers can use both formal and informal assessments to establish what children already know and understand, what concepts and skills could be understood with more practice and experience, and which are too difficult without providing additional support. Assessments of children's learning can also be utilized by teachers for feedback on their own teaching practices in order to modify curriculum, adapt instructional activities, and fine-tune classroom routines to be the most effective possible.

Portfolio Assessment. The term authentic assessment is used by educators to describe and recognize a performance-based, realistic, and instructionally fitting method of assessment¹¹¹. One type of authentic assessment very appropriate in early childhood is the use of portfolios^{112,113}. A portfolio is defined as a purposeful collection of student work showing effort or achievement in one or more areas¹¹³⁻¹¹⁵. The portfolio is a record of the child's learning over time and incorporates the following¹¹³:

- What the child has learned;
- How the child has gone about learning;
- How the child thinks, questions, analyzes, synthesizes, produces, creates; and
- How the child interacts--intellectually, emotionally and socially--with others.

In deciding which pieces to include, teachers can turn to reflecting on the purpose of the portfolio. In this way the portfolio can be fully utilized and not become just a random sample of children's work. Several purposes for portfolios have been identified¹¹⁶⁻¹¹⁸, such as to:

- Make sense of children's work,
- Communicate about their work,
- Relate the work to a larger context,
- Motivate children,
- Promote learning through reflection and self-assessment, and
- Be used in evaluations of children's' thinking and writing processes.

In early childhood education, after determining the purpose(s), the most effective portfolio includes an ample variety of work samples. To make the portfolio even more meaningful, successive drafts of work on specific projects or tasks can show the progress a child has made. Researchers also agree that allowing children to have some input into which items they would like to include in their own portfolios leads to children become more aware and analytical about the work they complete^{113,116,119}. Some of the common elements of a portfolio include^{113,120}:

- Work samples,
- Photographs,
- Audio and visual recordings,
- Observation notes,
- Instructional objectives checklists, and
- Screenings or progress monitoring results.

The use of the portfolio approach has several strengths for the early childhood educator. One is for evaluating growth and achievement through the capability to compare the individual child's current work to his or her previous work-as it is not appropriate to use portfolios to compare children to one another¹¹³. An important consideration is to link how the child is progressing toward standards connected to the curriculum (both of which of course need to be developmentally appropriate). This connection serves as a strength for supporting curriculum and instructional planning¹²¹. A final area of strength is that one of the most meaningful ways that educators can share information with parents is through the portfolio because it represents such a concrete example of a child's work and progress^{113,122}.

Technology-Based Progress Monitoring

An important area emerging is using technology for assessment and progress monitoring. Technology holds much promise in this area. The ebook "The Vital Guide to Monitoring Child Progress" provides a wealth of information and concrete examples¹²³. Many teachers are discovering using portfolios in digital form as the core nature and purpose are maintained but allow the teacher, the children, and the parents much more flexibility and deeper views with the affordances of the technology. For example, imagine the power of a work sample that is actually showing the child performing the actions, a story that has an audio clip of the child narrating, or a sequence of photographs that are in a slideshow illustrating the stages of a project the child has completed over time.

Advances in computer software programming now allow the experiences of the learner to be much more interactive and to bring to their teachers a wealth of highly valuable information and insights. Progress monitoring that is built into learning

software can facilitate children reaching their goals in two main ways 1) matching to the child's level of understanding and readiness and moving them to more advanced skills after the child has shown competency in those more foundational and 2) giving teachers an efficient and accurate method by which to design instructional opportunities for children based on their individual needs and learning preferences.

Yet even with such compelling reasons and available resources, many teachers are inconsistent in their use of technology-based progress monitoring. It has been suggested that this is related to findings that the successful adoption of technology is improved through opportunities to learn about and practice in real-world settings over time; even more enhanced when done with a skilled mentor and/or collaborative team approach¹²⁴.

Key Message: Conducted appropriately, progress monitoring and appropriate assessment make a vital contribution which may make the difference between a child who is ready for school and a child who is not. Teachers who have the knowledge and skills to use the information gained through traditional and more informal methods such as portfolios as well as more structured progress monitoring, help assure children attain the skills in literacy, math, science, social studies, and social-emotional functioning needed for success in the preschool years and throughout their school career. Technology-based built-in progress monitoring connected to generating the appropriate scaffolded experience for children are being used very successfully with early learners. Coupled with the information from such experiences allows their teachers to effectively offer targeted instruction and support to facilitate children reaching these important and necessary goals.

Classroom Design and Management in Early Childhood

The importance the role of classroom management and the physical environment play in early childhood programs is now well established^{2,5}. These can directly impact the kinds of behaviors that children exhibit and whether the environment is orderly or chaotic. This in turn has a strong relationship with how well children will be able to learn. Together, emotional support, classroom organization, and instructional support offer great opportunity for young children's success¹²⁵.

Classroom Design. With respect to the physical space, the following should be taken into consideration⁵:

- Traffic patterns that flow well;
- Materials placed where children can access them;
- Storage that is organized;
- Adequate supplies and equipment;
- Well defined areas and boundaries;
- Thoughtful placement of centers;
- Work areas for large group, small group, and independent or one-on-one learning;
- Furniture that fits the children and activities; and
- Rich with print and with children's work.

Classroom Management. The management of the classroom revolves around how and which activities occur and are conducted throughout the day. In addition to an orderly and carefully thought out physical environment, attention to an orderly routine is also critical for children to experience success each day. Effective classroom management means that there is an overall structure that is predictable but that also is dynamic for interesting learning to occur.

Key components include⁵:

- Daily plans, which can be supported with charts for the children (e.g., Helpers, Attendance, Centers);
- A system that helps children know what to do (e.g., color coding);
- Consistent use of and fair enforcement of rules; and
- Frequent feedback.



Key Message: The interactions that occur in a well-designed and managed classroom are the key to seeing their full potential for children’s learning. When classroom set-up and management run smoothly, the teacher and children can attend to building strong, trusting and responsive relationships with one another and to the excitement of learning. Research strongly supports that the primary mechanism through which children learn is through responsive interactions between themselves and adults.

Professional Development for Early Childhood Education Teachers

There are clear associations between improvements in early childhood teachers’ professional development and improvements in the learning and development of their charges³. Professional development can be distinguished from training as it has at the core, based on “development”, change over time. One-time brief professional development experiences that are by definition disconnected from opportunities to try out what is learned and receive feedback within a collaborative setting are less effective. When professional development occurs that targets educators learning about best practices for teaching vital academic/cognitive and social skills and for using data to inform instructional decisions, children’s learning is enhanced through better teacher decisions and actions.

All areas have an important place in the overall professional development plan but the area of technology is one in which teachers may need particular attention. Teachers are using technology-based learning experiences for children in early childhood settings more and more frequently and doing so on a regular basis. The results of a recent survey of early childhood educators revealed that when interactive technology is used with children, less than 10% of teachers use it less than weekly, meaning 90% have made technology an integral part of their classroom environments²². That said, it is also recognized by the teachers themselves and by leaders in the field that professional development on how to do so following best practices is an area of high need^{22,124,21}.

There is another interesting consideration around technology. Technology can also play a critical role in delivering effective professional development to adults. Research shows that demonstrating effective teacher practices through video for example is associated with improvements in supporting teachers learning how to teach in new ways. Learning Management Systems¹²⁶ and full courses are emerging to do just this¹²⁷.

Key message: Professional development is the wheel around which new knowledge and practices are imparted to teachers once they are on-the-job. Gaining such skills by teachers has positive impacts on children’s learning. Important across many content areas and approaches, professional development about how to best use technology with children is particularly of high importance and may be facilitated by the fact that professional development delivered by technology represents a learning environment for teachers similar to many of the practices they will be putting into place for their own students.

Hatch Resources for Educators:

Hatch Learning Management System (LMS): <http://lms.hatchearlylearning.com/>

Live Expert Webinars: <http://hatchearlylearning.com/resources/events/early-learning-expert-webinars/>

Archived Expert Webinars: <http://hatchearlylearning.com/resources/events/archives/>

Slideshare: <http://www.slideshare.net/HatchEarlyLearning>



eBook Library: <http://hatchearlylearning.com/resources/ebooks/>

Online Training: <http://hatchearlylearning.com/support/training/training-registration/>

Hatch Blog: <http://hatchearlylearning.com/resources/blog/>

Summary

The purpose of this paper was to bring together the research basis for a powerful set of innovative products designed to prepare children to be ready and successful in school. Here we have presented the research that comprehensively defines “high quality” early childhood education programs with a focus on positive outcomes for young children in the area of school readiness. From this research, Hatch has culled a solid set of multi-dimensional and interconnected design principles on which the Hatch Innovative Product line is built. Hatch is pleased to both use and promote this process.

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