

The Science of Intellivance

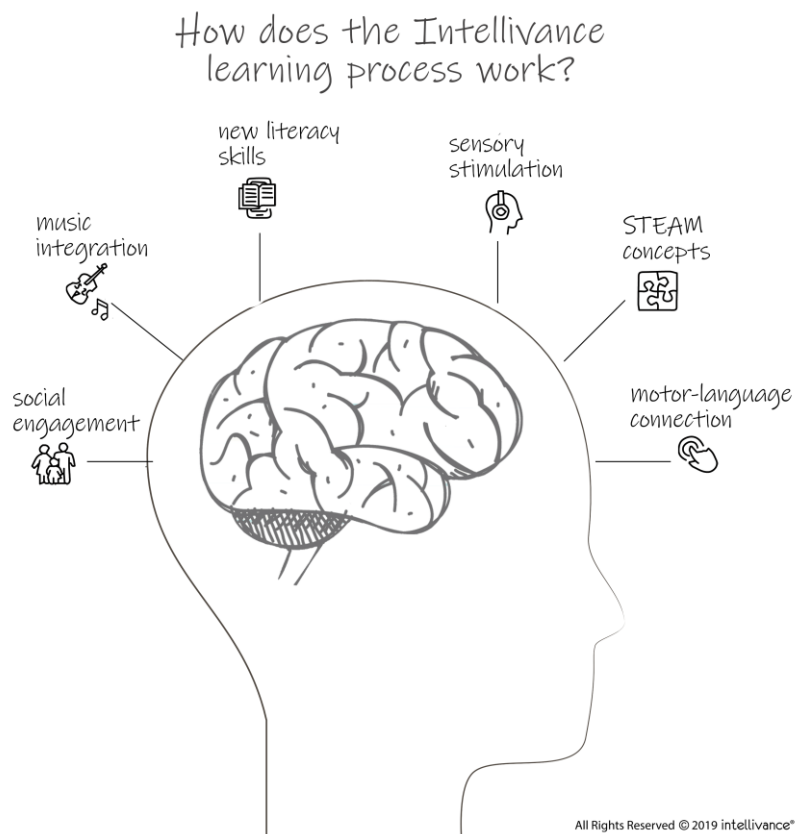
Designed for those who learn differently, Intellivance helps everyone think differently.

Why Intellivance?

The Intellivance intellectual property (IP) was developed to take advantage of human evolutionary adaptations. From physical adaptations like a bilateral body plan to enhancements in cognitive functions like social meaning-making, we quite simply evolved to learn this way. This provides a holistic and accessible approach to learning unlike anything before it. We have created an entirely new language of everything. The Intellivance approach is accessible and sustainable for learners of all abilities.

What Does Science Say?

Through years of research into many fields of scientific study, the Intellivance IP was developed with a firm basis in educational best practices, the science of learning, cognition, psychology and brain dynamics. Our system has application for individuals ranging from early childhood, through school age to adults with special learning challenges or cognitive decline. Our core IP has been developed focusing on some of the most important concepts from education, learning, cognition and psychology. Through our IP development we have explored many schools of thought. Here we will highlight six key concepts we apply to the Intellivance IP: motor-language connections, music integration, new literacy skills, sensory stimulation, social engagement and integration of STEAM concepts.



Sensory Stimulation

Importance of Multi-Sensory Stimulation

The human brain has evolved to process multi-sensory information. It is the way we experience the world around us. Much of traditional educational theory engages uni-sensory processing which is far less instinctual to us. (Shams and Seitz, 2008).

Our approach was also influenced by Vygotsky's understanding of psychological processes, particularly by his work focusing on the zones of proximal development. This theory suggests that users be encouraged, within a guided learning experience, to engage with multi-sensory stimuli to construct meaning for themselves. (Vygotsky, 1978).

By engaging multiple sensory experiences simultaneously, we are able help learners increase sustained focus which is particularly important for learners with special needs. The ability to focus often presents as a large obstacle for those with unique learning differences. (Thompson, 2011).

When learning occurs using sensory input from multiple senses, a greater amount of activity occurs in processing areas of the brain. In studies, brain regions that are stimulated by multiple stimuli show increased numbers of synapses and dendrites in those processing areas, which results in increased brain connections and neural connections. (Willis,2007).

The Intellivance approach seeks to increase independence and sense of fulfillment for all learners. By engaging in multiple sensory stimulation, we find learners have increased language development, advanced gross motor skills, social interaction and problem-solving that help create these desired outcomes. These are areas of key concern to those with learning challenges.

One of the most profound benefits found when employing multiple sense is users are presented with a more engaging approach versus uni-sensory applications. When learners participate in auditory, visual, kinesthetic and tactile activities, there are far less opportunities for minds to wander from intended purposes. Additionally, engagement and motivation are integral in knowledge acquisition.

Sources:

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Motor-Language Connection

Natural Links Between Motor Skills, Cognitive Function and Language Development

The Intellivance system is designed to take advantage of human evolutionary advantages. Both motor and cognitive functions likely share evolutionary roots. There is clinical brain scan data that demonstrates several brain regions integrate both functions. Language development is a key outcome of higher cognitive function. We believe that using both functions simultaneously will increase knowledge acquisition through natural brain links.

Many people who have an intellectual or developmental disability have weakened central coherence which is responsible for motor control. Many young children are just learning motor control. There are many options for increasing motor ability and control, the Intellivance approach offers a unique combined approach that integrates motor control with other senses. Studies show that sensorimotor control can increase neural activity and plasticity. The Intellivance system aims to engage motor skills as a key function in cognitive and language development. (Leisman, Moustafa and Shafir, 2016).

There are many varying theories of language development and many early theories suggested that it was quite separate from motor skill development. There is a body of new research however that suggests that as young children acquire increased balance, movement and manipulation of objects, they are opening access to their world and engaging much needed skills that directly and indirectly impact language and communication skills. (Iverson, 2010).

We have reviewed many studies on the bilateral body plan of humans, with focus on the bilateral brain. This has very large implications to both motor skills as well as language development. There are several studies that suggest that young children who develop early object manipulations skills have shown parallel advancements as they develop language skills. Additionally, many special needs learners who experience language delays have seen great improvements by stimulating motor skill development. Several studies have shown children with autism or other developmental disabilities demonstrated advanced language skills by engaging in right-handed activities. Movement on the right side of the body is guided by the left side of the brain- the left side also houses around 90% of the speech processing centers. Many evolutionary theorists believe that early communication was likely gestures and expressions, also providing support to the motor skills importance to communication and language. We strongly believe these parallel cognitive actions allow humans to uniquely develop skill sets; the Intellivance system was developed to enhance these natural connections and increase pathways for learning.

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Iverson J. M. (2010). Developing language in a developing body: the relationship between motor development and language development. *Journal of child language*, 37(2), 229–261. doi:10.1017/S0305000909990432

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Social Engagement

Importance of Social Engagement to Learning

As humans we evolved to be a social species, we learn, communicate and engage with others so that we may better understand the world around us. Teamwork and social engagement are increasingly important as our society depends more and more on technology. At Intellivance we believe the skills we gain from interacting socially with others is integral to successful learning.

A large piece of cognitive development comes from culture, history, and social interactions. Many of these concepts come from Vygotsky's zones of proximal development. He suggests that through interaction with peers, learners gain new skills and strategies through observation and cooperation when engaged with tasks. Intellivance promotes these aspects of learning through social play and interaction with music.

Vygotsky's suggests that scaffolding (a tutoring or mentorship model) and the zones of proximal development for learning is applied to the social dynamics within the Intellivance system. Experienced learners offer their knowledge and skills to pass down to newer learners through collaborative learning that is beneficial to both parties.

The Science of Social Semiotics

Social semiotics seeks to understand the ways people communicate within social situations; in a very simple sense it is the science of making meaning through interactions with other humans. As humans we have developed many modes of communication that are used to shape our social interactions at all levels. These modes don't have hard and fast rules, but rather are defined by the ways in which we used them to interact with others. Intellivance seeks to enable learners to make meaning by engaging with other learners and by sharing that knowledge in a cyclical social process.

Finally, there are many learners that struggle with social interactions and this affects many aspects of their learning process. The Intellivance system promotes collaboration with others through multiple senses, in many cases sensory-motor stimulation has been shown to have a positive effect on these learners' social skills.

Sources:

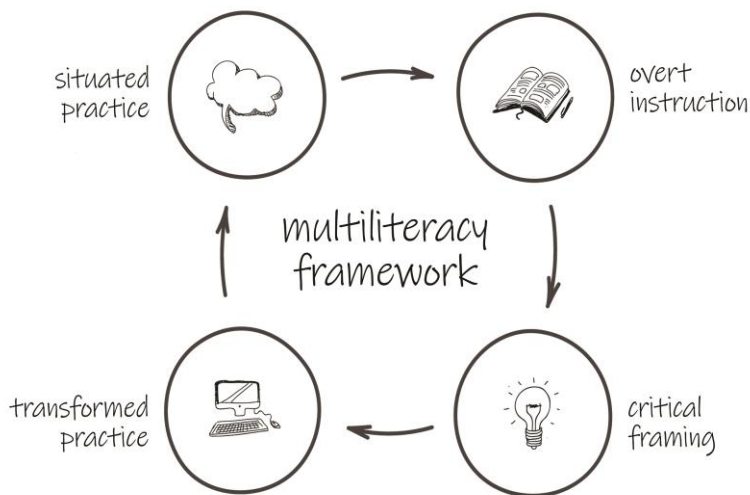
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New Literacy Skills

What are New Literacies? Why do they matter?

New literacies or multiliteracy skills are an educational method that is defined by the ability to identify, interpret, create, and communicate meaning across a variety of visual, oral, corporal, musical, and alphabetical forms of communication. There are four key pieces to the multiliteracy framework: situated practice (immersion), overt instruction (open instruction), critical framing (interpreting meaning) and transformed practice (learning by doing).



Individuals who interact with the Intellivance system are immersed into content that is manageable both individually and in groups or situated practice, tailored to meet the learners needs in overt instruction with clear goals and interactions, work within a framework that the individual can critically analyze and reflect upon what they have created or accomplished within the system through feedback data processing, and transform the knowledge they have acquired through meaning making and interact with other learners to advance understanding and development of learned content.

Combining Literacies and Modes

At Intellivance we also combine various literacies and modes for increased connections within learning environments. An additional strategy employed in the system is interleaving (mixing of multiple subjects simultaneously) to increase understanding and comprehension as well as reinforcing like literacies. Through engaging with the Intellivance system a learner can experience math while playing music or science while creating art.

Sources:

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Music Integration

The Importance of Music

There are vast benefits of integrating music into the learning process. Learning music helps develop language skills, reasoning, memorization, coordination, auditory skills, spatial intelligence, creativity and even collaboration. Music is an integral part of the Intellivance process. We employ music as a vehicle for exploring concepts to capitalize on the brain stimulating power of music.

It is believed that humans evolved a “musilanguage” for communication, long before language evolved. (Brown, 1999). In this sense music sets the tone for our abilities to share emotion and meaning with other humans. Brown suggests that both music and language processing share similar evolutionary precursor. At Intellivance, music is a key motivator, link and vehicle to help users increase cognitive processing. We believe this stems from our earliest stages of development.

Music has played an important role in human life in nearly every culture throughout history. Music helps us tell stories, serving as a form of communication. Music is used to celebrate, mourn, and to express all other emotions even for those who struggle to express themselves. Music embraces rhythm which is integral to movement and dance providing pathways to physical expression and motor skills. It is a unique vehicle for all aspects of the human experience.

The Intellivance Approach to Music in the Learning Process

A unique feature of the Intellivance system is the integration of rich music theory concepts early in the learning process, unlike traditional methods of learning music that focus on memorization of notes/songs long before concepts of theory. Music theory is the grammar of music and our indicia allows for understanding of the abstract concepts of music such as pitch, scales, and chord structure as well as harmony, rhythm and melody. You can certainly use Intellivance to learn music, but music plays an important part of learning other literacies as well.

At the core of the Intellivance intellectual property is our representation of abstract learning concepts, such as music theory or arithmetic, and presenting them visually. Each visual element in our indicia represents a unique set of abstract concepts. This allows for multiple forms of sensory impressions to be tied to a multitude of visual elements. This is a flipping of the traditional order for teaching concepts; we encourage users to experience patterns of the abstract concepts and then provide the words and explanations for describing those concepts.

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STEAM Concepts

Integrating Concepts from STEAM

Science, technology, engineering, art and math (STEAM) are receiving great attention currently with a shortage of qualified STEAM professionals in the workplace. Intellivance uses aspects of STEAM throughout our patent-pending approach to expand learning and to create new pathways of comprehension using these very necessary disciplines.

Mathematics, Number Theory and Prime Numbers:

Mathematics skills are of key concern for all 21st century learners, just as they will continue to be valuable to employers and in daily human activities far into the future. Even learners with special learning abilities require math skills to live fulfilled lives of purpose and perform daily activities such as recognizing numbers, their order and telling time. Math sits at the root of the Intellivance tree.

Number theory is key to developing arithmetic problem-solving skills. Arithmetic sets up the framework for future success and skills needed in business environments. Learning to tackle things like algebra prepares the mind to make a reasoned business case or solve budgeting issues.

Prime number theory and factoring are a core building block of the Intellivance approach. Our symbols are meaningful and tie them to various other classic literacies (science, technology, engineering, art). In many cases, factoring and understanding of prime/composite numbers present learners with a literacy block, which can result in math frustration.

Art/Music:

Art has been referred to as being the great communicator for life's emotions. For centuries humans have used arts to express emotion and document life. The neural connections between music and math are well documented. Intellivance applies those connections to a system that illuminates both areas while giving students an invaluable lifelong tool for learning. Using music as a vehicle to explore STEAM concepts, traditionally complex music theory is put into practice early in the learning process taking the mystery out of music and breaking down barriers to performance, composition and music appreciation.

In addition to musical art, visual art is another building block of the Intellivance approach. Our unique symbology uses basic colors and simple shapes. Those working in marketing and advertising have long known the value of color theory, strong graphic representations, eye pleasing logos and even jingles that stick in our heads long after hearing them. We use concepts derived from these established practices to help learners develop rich neural connections.

Technology:

A unique aspect of the Intellivance system is our use of technology; from our use of ancient tech like the clock to modern tech such as complex computer applications. We make use of the universally understood 12-hour clock in both function and design for our experiences. Our holistic system can be applied in low-tech applications such as coloring sheets, hand drawn expressions, block manipulatives and stickers to very high-tech applications such as computer software and apps, musical instruments and even virtual reality experiences. This is technology that knows no bounds.