



Texas School for the Blind & Visually Impaired

Outreach Programs

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Understanding Concept Development and Related Challenges for Academic Students with Deafblindness

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Abstract: This article is a research-based examination of ways to understand the development of concepts by students with deafblindness. It also provides practical suggestions on how to teach and reinforce those concepts for academic students with deafblindness.

Key Words: concepts, concept development, deafblindness

Much of the information in this article was obtained through collaboration between the Texas deafblind Project and the educational team that supports Natalie Avila at McNeil High School in Round Rock, Texas. Team members include Rachel Collins, Teacher of Students with Visual Impairments (TVI), Brit Budd, Teacher of the Deaf and Hard of Hearing (TDHH), and Jennifer Groeshen, Intervener and classroom teacher. Natalie is 17 years old and in the 11th grade. She attends classes within the Regional Day School Program for the Deaf at McNeil High School in Round Rock, Texas. Natalie is congenitally deafblind and has no vision. She wears a cochlear implant and can hear some environmental and speech sounds. She uses tactile sign language to communicate and reads and writes braille.

Students with deafblindness often have difficulty accessing incidental information from their environment. This lack of access to information, stemming from a combined hearing and vision loss, can lead to difficulty in developing concepts. For example, students with deafblindness often have difficulty understanding how the world works, how parts of the world relate to other parts, how these parts are the same and how they are different. These types of misunderstandings can result in conceptual gaps. If the students have not touched "it" or experienced "it," they will probably not have a complete understanding of "it." This poses a real challenge for students with deafblindness being served in academic settings. In order to meet those challenges, we need to increase awareness of how humans develop a conceptual understanding of the world we live in. The work and research of Jean Piaget, a French psychologist, Jan van Dijk, a Dutch psychologist and expert in deafblindness, and Kurt Fisher, an American psychologist, can help provide a better understanding of how concepts are formed.

Jean Piaget described the period of exploration and interaction that typical learners undergo during the first two years of life as the sensorimotor period. During this foundational period of learning, children pair motor movements with sensory experiences. We tend to refer to these

explorations as “play”, however these opportunities extend beyond playtime. Students with typical hearing and vision spend every waking minute receiving sensory information through their auditory, visual, olfactory, gustatory, and vestibular systems. They are continuously listening, looking, touching, tasting, and feeling objects, as well as people, in their environment. A two-year old child’s brain and body has had millions of sensorimotor experiences by the time a second birthday party rolls around. The neurological framework for all future learning is formed during these foundational explorations and interactions.

Piaget also explained that for children to move from one stage of development to another, three factors must be in place. The first factor is physical and physiological growth. The second factor is sensorimotor experience, the acting on and thinking about real objects. The third factor is social interaction. This is interaction that occurs by playing, talking, questioning, and working with others, especially peers.

Jan van Dijk told us that all we know can be traced back to our actions and experiences. Our experiences moving through the world and interacting with people, places and things form our conceptual understanding of the world. These experiences help us form concepts that may be unique to us. We are often drawn to strong conceptual experiences based on our own personal preferences. For example, my father grew up on a ranch. He loved ranch life and working with his favorite uncle on the ranch. His experiences growing up and working on the ranch resulted in him becoming a skilled horseman. I was raised in the suburbs; I can’t tell you the difference between a Quarter Horse and an Appaloosa, let alone get one to a gallop! In short, we learn the most about topics that we are exposed to and enjoy. When we are allowed to initiate a learning experience based on our preferences, the neural pathways that are formed around the concepts involved grow at an increased rate and strength. Concepts learned in this fashion become embedded within us and form a framework for other concepts to be built upon.

Kurt Fischer said we build on basic concepts by adding bigger and bigger conceptual pieces to our understanding, systematically adding new pieces of information on top of existing pieces. For example, when a child first plays with Legos, they learn about the individual properties of one Lego: its size, color, shape and texture. Next, they may discover those same properties in another Lego. Eventually they learn how the two Legos fit together. All the while, these children are developing an understanding of what a “Lego” is and that there can be “Legos” of different sizes and shapes. This is the process of concept building. New concepts are built by attaching them to existing concepts.

The information about concept development provided by Piaget, van Dijk, and Fischer highlights some important questions for our students with deafblindness served in academic settings, students like Natalie. How do we provide sensorimotor learning opportunities for Natalie? How can we create the repetition that occurs during this period for typical learners? Can we create repetition that includes social interaction? How can we attach new concepts to existing concepts? How can we create rich experiences that are based on Natalie’s interests?

Let’s explore each question, one at a time.

How do we provide sensorimotor learning opportunities for Natalie?

It is not appropriate to simply surround Natalie with objects and ask her to “play” all day at school. She has moved beyond the sensorimotor stage of development. However, creating

lesson plans that allow for sensorimotor experiences that are tied to her academic curriculum is an appropriate and necessary way to foster her concept development.

This type of experience took place during a recent lesson in Natalie's agriculture class. During classroom instruction Natalie was informed that pig breeds can be classified into two categories, pigs with drooping ears and pigs with erect ears. After the lecture and note-taking portion of the class, Natalie and her intervener traveled to a nearby farm. She was provided an opportunity to walk through the pig stalls and tactually explore each animal to see if they had drooping or erect ears. This exploration led her to discover some sheep. She eagerly explored their ears asking questions about their characteristics. She expressed a great deal of interest in the softness of the sheep's wool and the difference in fine wool, medium wool, and long wool. Natalie was delighted to learn that that soft wool is used to make clothes. This information connected to a past lesson about clothing fabric. It was a topic in which she had shown interest in the past and she was delighted to feel wool on the sheep! This sensorimotor learning experience allowed Natalie to explore and make conceptual discoveries on topics that were meaningful to her.

Natalie's team is working on scheduling a regular time in her daily or weekly schedule for experiential learning opportunities. The planning for such experiences involves multiple members of her educational team: the TVI, the TDHH, her intervener, the content specialists, the Orientation and Mobility Specialist, and Natalie's family.

How can we create repetition opportunities?

Repetition is beneficial to all learners. How can we create the repetition that occurs during the sensorimotor period for typical learners during Natalie's school day? Can we create repetition that includes social interaction with peers and familiar adults? Teachers of all students create and administer lessons by pre-teaching, teaching and re-teaching. For Natalie, special attention needs to be paid to this process. Pre-teaching the main components of her lesson before diving into the content allows Natalie the opportunity to gain a clear understanding of how to categorize the information that follows. For many of our deafblind students served in academic settings, facts come at them in fragmented bits and pieces of information. When they have a clear understanding of the main points, it allows them to grab the pieces and tie them to the bigger picture with greater ease. Taking time before each lesson to carefully explain the main points of each lesson creates a level of efficiency in the learning that otherwise would not exist.

Allowing Natalie to write the information down and engage in conversation about the vocabulary and concepts involved will support her reading and writing skills as well as her concept development. Natalie's team sets aside time in class for her to braille vocabulary words and definitions associated with each lesson. They support her in creating an organization system for each class that she can reference when she desires. Her team also creates time at the end of the day where re-teaching of main points from the day's lesson can occur. This time provides Natalie an opportunity to ask additional questions and participate in additional conversations about the day's instructional content.

Additional opportunities for repetition can be provided through alternative homework assignments. Natalie could be assigned to discuss parts of her lesson with classmates or family members. To help structure these discussions, support can be provided in creating interview questions or mini presentations of the material. Team members can facilitate an interview

process between Natalie and classmates both in and out of the classroom environment. The team can allow her to create a record of these interviews, one that she can read during independent time at school and at home. She may need the team's support in sharing the information gathered from these conversations. E-mail may be a way for her to facilitate additional conversations.

How can we attach new concepts to existing concepts?

We know that new concepts are built upon existing concepts. This means that we must evaluate related existing concepts before beginning instruction. The TSBVI Requisite Concept Evaluation (in development) is an assessment option that can help teams gain insight into existing concepts and any conceptual gaps.

Natalie's team evaluates her concept development by asking her open ended questions related to her lessons and listening carefully as she responds. For example, when introducing a lesson about Brazil, Natalie's teachers carefully selected a few open-ended questions to ask her. The questions were: "Which continent is Brazil on?" "What types of food do people in Brazil eat?" and "What language do people in Brazil speak?" These questions were specifically selected because Natalie has an understanding of the continents as well as foods that are specific to various regions of the world. They were unsure, however, if she knew this information specific to Brazil. They asked her the questions and listened to her responses. They avoided asking simple "yes" and "no" questions.

To gain additional information about Natalie's existing concepts, her team can talk to the people that know her best: her family. Regular phone calls or e-mail communication related to Natalie's prior experiences with instructional content can greatly support her teams' understanding of existing concepts. Supporting Natalie in developing a student-parent interview form that she can take home to interview her family about an instructional topic would also be a useful tool and process. Ask her to report the information to her classmates and teacher. Remember, these additional opportunities for social interaction which are built around her class topics are necessary to facilitate her concept development.

How can we create rich experiences based on our student's interests?

Team members can collaborate with Natalie and her family in creating a list of preferred topics, activities and interests. The list, as well as conversations that can occur while making the list, can inform instructional planning to include opportunities for Natalie to participate in learning about and around topics that she enjoys. Her team can consider ways to incorporate these interests into the existing curricular content as well by creating supplemental learning opportunities.

Natalie and her family enjoy hiking and swimming. When learning about new countries, she will often ask questions about what types of land masses exist in the country. She will ask if there are mountains, streams, and volcanoes. In response to this information, she enjoys exploring tactual maps of the country while asking questions about what it would be like to traverse these various land masses and bodies of water. The vocabulary that she is introduced to during these question and answer sessions has real meaning to Natalie. Because her team is aware of her

interest in hiking and swimming, they allow her to relate those interests to new information in geography class.

Summary

In conclusion, the challenges posed in supporting Natalie's concept development are real. She, like many individuals with deafblindness, requires a unique presentation of information to accommodate her dual sensory loss. This presentation is very different from what we see in typical academic classrooms. Her combined vision and hearing loss impact every moment of her learning and therefore must be considered in every moment of her instructional planning.

Working to help Natalie meet and overcome these challenges is itself a challenge that requires teamwork and creativity. Working to support and inform a student's perception of the world is important work. Helen Keller, in her memoir "The Story of My Life," describes what life was like before she developed a strong conceptual understanding of the world. She wrote, "Have you ever been at sea in a dense fog, when it seemed as if a tangible white darkness shut you in, and the great ship, tense and anxious, groped her way toward the shore with plummet and sounding-line, and you waited with beating heart for something to happen? I was like that ship before my education began, only I was without compass or sounding-line, and had no way of knowing how near the harbour was."

In our work with students with deafblindness, we are tasked with helping our students learn how to connect to the world around them, to provide them the information they need to use their conceptual compass and sounding line, and help them come out of the fog and fulfill their vast potential as learners and people.

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