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Problem-Solving Instruction Creates Math Thinkers

The "ah-ha" moment that lights up a student's face when he/she understands a math concept is what every mathematics teacher strives for. And when that understanding is evident, there's a big smile on the teacher's face as well. These light bulb moments are happening more often when teachers use new instructional methods where they listen more than lecture.



The program deals extensively with classroom observation and teacher supervision. It provides a broad overview of fundamental ideas about mathematics, learning and teaching, as well as in-depth examination of classroom observation, teacher professional development and teacher supervision.

"We help the principals to be partners with teachers to help strengthen instruction," says Tabernik, who teaches Lenses on Learning. "It's not just about doing an observation to see an orderly classroom; it's about interaction with teachers and students, content and how teachers are guiding instruction."

Participants in the three-day Lenses on Learning training explore topics such as constructivist learning, intellectual climate assessment and post-observation teacher counseling. Training sessions are rigorous. Participants are involved in reading, research, discussion and intense learning. They are also responsible for completing homework assignments.

Research shows that mathematics and science achievement are especially critical to student academic and career success, therefore high-quality math and science programs are essential to helping students achieve. "Math is not just a book or learning how to work with fractions or measure something, it's about understanding the underlying concepts behind the procedures," says Dr. Anna Marie Tabernik, SMART (Science and Mathematics Achievement Required for Tomorrow) Consortium director of professional development.

To make strides in effective and successful learning in math, between 50-60 elementary and middle school building principals and administrators in SMART member school districts in the SST Region 4 area have participated in the Lenses on Learning Leadership Institute over the last three years, an initiative of the Education Development Center (EDC), located in Newton, Massachusetts. Sessions are sponsored and hosted by SST Region 4.

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The basics of their studies are the six NCTM (National Council of Teachers of Mathematics) principles, which are the foundation for a high quality mathematics program. They include equity for excellence, curriculum, effective teaching, learning, assessment and technology. To put these principles into action, administrators can support teachers by addressing each area. For instance, regarding effective teaching, administrators need to look at not only what students are learning, but how teachers can learn what they need to know.

“The class reminded me that teachers should be listening, looking and accepting several different methods for students to arrive at the correct answers to math problems,” says Park Elementary School (Chardon Local Schools) Principal Rhonda Garrett, a Lenses on Learning “alum.”

“The more teachers understand about mathematic concepts, the better the students can understand it. Some things have to be memorized – no doubt. But the power of mathematics is to reason through problem-solving with the skills they already have,” Dr. Tabernik explains further.

She contends that it’s all about the big ideas in mathematics. If teachers teach the big ideas well, everything else will flow. If students don’t understand the concepts, they will have a difficult time moving forward. According to Dr. Tabernik, to be most effective in mathematics instruction teachers need to “math talk.” That is, they need to ask students the right questions and listen to what they are saying so they can build understanding. By listening to students’ mathematical thinking, teachers can use this information to determine the instruction method that could help students’ thinking.

To do this, teachers must have a deep understanding of mathematics themselves at a conceptual level. How to teach and use math concepts is very important. How to solve an equation is more critical to understanding than following procedures and formulas. Immersing teachers in activities to learn the concepts themselves, just like their students, is one way to improve instruction.

For example, instead of teaching the formula for the surface area of a rectangle and asking students to remember it, giving students a problem such as “I need

to make a box for 24 cubes. How do I do that?” encourages students to think outside the box. By using the process standards where students use their prior knowledge and think, relate, reason, improve and use conjecture to problem solve; they will begin to make the mathematical connections, and real understanding occurs.

Garrett agrees. “Students need time to process math and create their own logical meaning and math language. I witnessed this first hand in a kindergarten room while doing an observation. I could see the wheels spinning and the concept develop as the student explained how he arrived at his answer,” she says with conviction.

After completing Lenses on Learning in the fall, North Madison Elementary School (Madison Local Schools) Principal Sally Rogus met with her staff members and gave them a couple of the problems she was asked to solve in class. As a result, the teachers began to change their instruction and incorporate “math talk” instead of lecturing.

Rogus says, “I observed four classes, and after the fourth class the teacher asked the students, ‘Do you like the math class when the teachers do most of the talking, or do you like when we give you problems to solve and you do the work?’”

Almost all of the students said they preferred the problem-solving classes where they could work through the problems themselves.

“Making teachers a part of the process is essential in changing instruction. They take ownership of the change and become believers when you share an idea and they see it work,” she adds.

Although Rogus admits that the impact on Ohio Achievement Test scores is too soon to predict, the new test format that requires students to explain how they reach their answers also fits well with the problem-solving method of class instruction.

“Problem-solving creates math thinkers rather than procedures to get the correct answer. It’s one thing to get the ‘A.’ It’s another to understand it,” concludes Rogus.

Transition to Adulthood: How to Make it a Successful Journey for Students with Disabilities.

Edward G. Flegel
NE Ohio Coordinator
Ohio Secondary Transition Improvement Grant

From the moment a student walks through the school door for the first time most people are already dreaming what that student will do the day they graduate. Parents are looking towards a future doctor, lawyer, educator, scientist, even president. Educators and business leaders are looking to provide employers with new innovators in technology, science, and math so employers can compete in a world economy. For students who have challenges in their learning styles, social skills, and behavior management, the transition to the world of work and higher education must be well planned.

Individuals with Disabilities Education Improvement Act (IDEA 2004) places an emphasis on postsecondary outcomes for students with disabilities. The importance of post-high school outcomes and a clear emphasis on postsecondary goals are important in increasing the student's opportunities for successful transition from their school setting. Transition requirements include:

- Preparing students to lead productive and independent adult lives;
- Providing students with effective transition services in order to promote postsecondary employment and education/training; and
- Meeting the unique needs of students with disabilities by preparing them for further education, employment, and independent living (if appropriate).

As a set of coordinated activities, transition services should focus on improving the academic and functional achievement of students, whether these activities are provided through specially designed instruction or related services, leading students to postsecondary activities.

Transition from high school to postsecondary options involves identifying a student's vision for the future and the services needed during high school to realize that adult goal. This service begins at age 14 in Ohio, or sooner if appropriate, with a future planning/vision statement and transition service needs tied to a high school course of study and age appropriate transition assessments. At age 16, or sooner if appropriate, measurable postsecondary goals

For students who have challenges in their learning styles, social skills, and behavior management, the transition to the world of work and higher education must be well planned.

in employment, education/training, and independent living, as applicable, are developed along with the needed transition services to achieve the postsecondary goals. These needed transition services include: instruction, community experiences, development of employment and other adult living objectives, related services, daily living skills (if needed), functional vocational assessment (if needed), and linkages with adult services. These services are intended to assist

students in making the transition from the world of school to the world of adulthood. Planning the types of needed transition services will be discussed as the IEP team considers postsecondary education and employment, and Independent living, if applicable. Once begun, transition planning drives much of the IEP process. Emphasis on long term transition planning and services will assist students in reaching their adult goals.

The Ohio Longitudinal Transition Study has identified predictors of postsecondary success from information obtained through interviews of students with disabilities one year after graduation. Students who passed the Ohio Graduation Test had a significantly better chance of being successful in college, whether a 2 or 4 year college. Students who participated in community work experiences, including summer jobs during high school, or participated and completed career technical education training, had a significantly better chance of being successfully employed one year after graduation.

Transition planning is life planning. Discussions begin when our students are just youngsters and follow a series of pathways leading to adult goal achievement. Early planning will result in future successes...for the individual and the community.

Spotlight on Transition Services in Lake & Geauga Counties

Secondary transition from school to post-school life has been one issue of particular concern at the federal and state levels since the reauthorization of the Individuals with Disabilities Education Act (IDEA) in 2004, notes Karen Lanning, Director of the Region 4 State Support Team (SST). A major reason for this ongoing concern is that there is a 68% unemployment rate nationally for adults with disabilities. The ultimate purpose of the special education and related services provided to students with disabilities under IDEA is to “prepare them for further education, employment, and independent living,” says Lanning. Vocational programming is one way to meet this goal.

“The importance of having these programs is that we provide students with the skills that will help them have a successful transition into adulthood,” says Kathy O. Mrsnik, Ph.D. Mrsnik is the Transition Specialist for the Region 4 SST. The SST provides school districts with information and training on compliance with standards from the Ohio Department of Education’s Office for Exceptional Children. Efforts are underway this year to improve articulation between agencies responsible for successful transition services. “Through this process, we hope to enhance the link between school services and adult services so that the transition is smooth for all students,” says Mrsnik.

School districts in Lake and Geauga counties have been working diligently to improve post-secondary outcomes for their students with disabilities through effective vocational programming. One such program, now in its second year, is the Lake Vocational Transition Consortium, sponsored by the

Lake County Educational Service Center. The consortium was created at the request of local special education directors, such as Rolanda Schonauer of Willoughby-Eastlake, to meet specific needs of students with moderate to intensive disabilities. The program is open to any student age 14 to 22 with an Individualized Education Plan (IEP) in Lake and Geauga county. The program includes a career assessor, who helps decide where each student best fits into the continuum, with placement determined by the IEP.

“This year, we began the expansion of the vocational transitional consortium and are now making it a continuum of services,” notes Kristen Brickman, director of the consortium. “The program is having so much success that students are mastering their IEP goals and moving on to the next phase of the continuum – which include less-supported, more independent and more challenging job tasks,” Brickman explains.

For instance, with Skills-Based Training, students spend half of their time working in the community and the other half in-house, honing vocational skills in areas such as kitchen and office work. Students also work on pre-vocational skills such as clocking in, checking their schedule, hygiene, dress code, work rules and their job for the day. These students work independently -- with a teacher or job coach checking in on their work at places such as a coffee shop or furniture store. They also run the store at the Willoughby Career Technical Center. “In the process, students are working on their communication skills, staying on task, following directions, and improving their money-handling skills,” Brickman says.

Students who complete the continuum and graduate high school are either found paid positions in the community or participate in programs with either the Lake County Board of MR/DD or Bureau for Rehabilitation (BVR).

“The whole point of our continuum is for students to be ready for competitive employment – going out and applying for a job and receiving a paycheck and benefits,” she says. “If students don’t get to that level, that’s fine; they are more prepared to go into the county program. But by starting them at 14 or 15 years old, they are going to be more prepared at 22.”

Vocational opportunities also continue to be available through long-established, vocational programs at Auburn Career Center, in Concord Township, and local school districts.

“We have been fortunate to have the Willoughby Career Technical Center available to our students with special needs,” says Rolanda R. Schonauer, director of Pupil Services for Willoughby-Eastlake City School District. “We have program opportunities for the full continuum of students.”



*Students
operate shredder
at Lake County
Educational
Service Center.*

Several vocational units designed specifically for special needs students are available: auto services, welding production, the vocational adjustment lab, clerical services, and hotel, restaurant and community employment.

Students may also pursue skill-training programs at Willoughby-Eastlake as well as career technical programs such as cosmetology through the Lake Shore Compact, in which the Willoughby-Eastlake, Mentor, Euclid and Wickliffe school districts share resources and career technical educational programs.

"We have an evaluator and a career assessment specialist that tests all of our children with special needs for vocational aptitude and training options that would be best for them," Schonauer adds. "We also have a transition-to-work coordinator that places students at community job sites."

"Kids with special needs don't lose jobs because they can't do the skills, they lose the jobs because of inappropriate social skills," notes Schonauer, who was once principal of the special needs vocational program in the district.

Auburn Career Center serves juniors and seniors, ages 16 to 18, from 11 high schools from Lake and Geauga counties. "Last year, we assessed 133 students, and at Auburn right now, about 23 percent of the student body is students with special needs in vocational training programs," notes Gail Michalski, special education and career resource director.

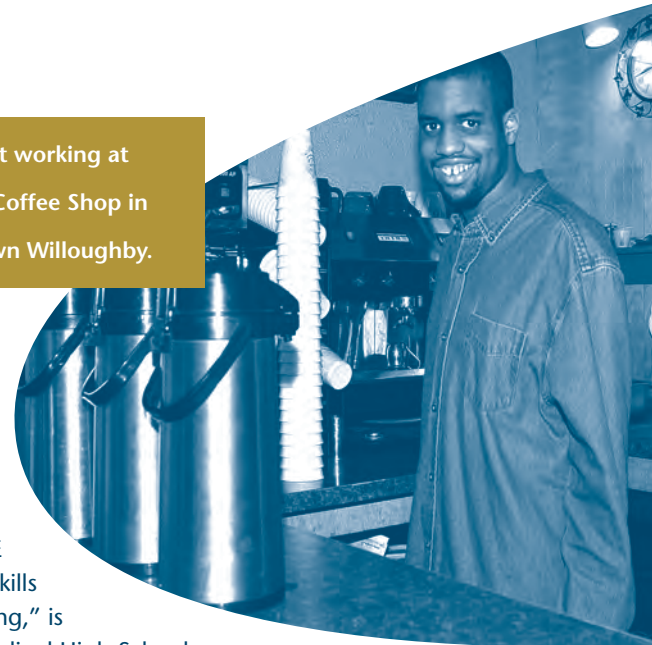
Michalski, a 14-year veteran at Auburn and a licensed professional counselor and certified vocational evaluator, says services have become more streamlined over the years. Programs have also become more individualized based on a student's needs. Today, a career assessment is performed in 10th grade and sometimes in ninth grade to highlight students' skill strengths and interests, she says.

"From there, vocational training programs as well as potential jobs are suggested to students or made available to students to develop an integrated career and life plan," Michalski explains.

The 23 vocational-training programs available at Auburn include a trade cluster, a health care cluster, a business/computer cluster, and a service training cluster, which includes programs such as horticulture, culinary and cosmetology. Auburn also offers Career Connections, a career exploration program, offering classroom and workplace training. Workplace training sites include Geauga Regional Hospital, Heather Hill Rehabilitation Center and Quail Hollow Country Club.

In Geauga County, there are two Job Training Coordinator units with Career and Technical Educational (CTE) accredited

A student working at
Enclave Coffee Shop in
downtown Willoughby.



courses offered to any school district in Geauga County.

The first CTE program, "Skills Based Training," is based at Cardinal High School.

Students with moderate to severe disabilities, ages 15 to 22, learn work skills at such worksites as Middlefield Library, Red Maple Inn or Gogen's Restaurant, in Burton, or Giant Eagle, in Middlefield. Students work on a series of vocational skills: customer service, cleaning hotel rooms, money handling, grocery bagging and stocking, organizing and labeling books, etc. Students are assessed through daily progress monitoring and state-wide standards linked to the Ohio Department of Labor and follow the Ohio Employability and Life Skills Assessment.

Geauga's second CTE program is located at Fieldstone Farm Therapeutic Riding Center. Gaitway High School is a public school program located at the Riding Center, providing academic and vocational curriculum geared to students, ages 15 to 22, with Emotional Disturbances. Instructional focus is placed on developing work behaviors, social skills, resume building and job exploration.

In addition, classroom-based, pre-vocational classes are being incorporated into high school special education classrooms throughout Geauga County, called Transitional Options. Students learn an array of skill sets: restaurant, recycling, library, grocery store, office skills and money handling.

Lake and Geauga educators agree that these programs help make their communities more aware of the work abilities of students with special needs.

"We are working very hard with the community to help them understand the needs of these students and what it would take to help these students be successful after graduation," Brickman notes.

"Students love going to work," she adds. "They feel a sense of self worth and importance and feel like they are productive citizens in society, which is what everybody strives for."

Ohio Improvement Process Promotes District-Level Approach for Improvement Strategies

Ohio is committed to the implementation of a unified state system of support directly focused on improving the academic achievement of all students and student groups. Six school districts in State Support Team (SST) Region 4 are participating in this worthwhile process: Wickliffe, Painesville City, Riverside, Madison, West Geauga and Cardinal.

The Ohio Improvement Process (OIP) is Ohio's strategy for ensuring a systematic and coherent approach for building the capacity of all districts and schools in meaningful and real ways. OIP allows districts to improve instructional practice on a district-wide basis and make and sustain significant improvement in student performance against grade-level benchmarks aligned with academic content standards for all students across the district.

Inherent in the OIP is the belief that:

- Improvement is everyone's responsibility – at all levels of the district and in all districts, but especially those in corrective action or improvement status;
- Leadership – the purpose of which is the improvement of instructional practice and performance, regardless of role – is a critical component of the OIP and must be addressed in more meaningful ways to ensure scalability and sustainability of improvement efforts on a district-wide basis;
- State-developed products and tools, including professional development, need to be designed for universal accessibility and applicability to/for every district in the state; and
- A unified state system of support requires the intentional use of a consistent set of tools and protocols by all state-supported regional providers, rather than allowing for multiple approaches across the state, based on preference.

Rather than focusing on improvement through a "school-by-school" approach, Ohio's concept of boosting student achievement redefines how people operate by creating a set of expectations that, when consistently applied statewide by all districts and regional providers, will lead to better results for all children. Using studies that indicate the critical impact of district and school leadership on student achievement, the Ohio Leadership Advisory Council (OLAC), a large stakeholder group convened by the Buckeye Association

of School Administrators (BASA), identified six core areas for categorizing the most essential leadership practices for superintendents and district and school-level/building leadership teams: the data and decision-making process, focused goal setting process, instruction and learning process, community engagement process, resource management process and board development and governance process.

The OIP involves four stages across which processes, structures, tools and people are connected – all with the intent of changing instructional practice and impacting student performance. The improvement process is highly focused, beginning with an honest assessment of student data and the identification of academic weaknesses that need to be addressed. **Stage 1** of the OIP begins with this kind of assessment using the Decision Framework (DF) tool. The DF is a decision-making process designed to assist districts in making data-driven informed and prioritized decisions about where to spend their time, energy and resources to make significant and substantial improvements in student performance. A state-developed data warehouse has the relevant data needed to complete the DF process readily available to districts and buildings.

The DF asks essential questions to assist District Level Teams (DLTs) in identifying and analyzing critical components (e.g., curriculum alignment

and accessibility) for improving academic performance of all students, including subgroup populations. The essential questions are organized around the following four levels: student proficiency, instructional management (curriculum, assessment and instructional practice; educator quality; professional development); expectations and conditions (leadership; school climate; parent/family, student, community involvement) and resource management (the intentional use of time, personnel, data, programmatic and fiscal resources).

Cardinal Local Schools is in Stage 1 of the Ohio Improvement Process having first met at the beginning

STUDENT PROFICIENCY

INSTRUCTIONAL MANAGEMENT

EXPECTATIONS & CONDITIONS

RESOURCE MANAGEMENT

of this school year and again in January. Although strategies have yet to be put in place, district leaders have reviewed data from previous tests and the state report card.

“We are focusing mainly on improving our reading and math scores for students in grades K-12, but our ultimate goal is to improve instruction throughout the district,” Cardinal Schools Superintendent Paul Yocum says. “Although no practices have been put into place, the dialog has been very positive, and I anticipate some very positive practices from the meetings.

At **Stage 2** of the OIP, DLTs affirm the priority areas identified through use of the DF in developing a district improvement plan that has a limited number of focused goals and strategies. Through the completion of the DF, the DLT prioritizes areas of greatest concern, as well as causes contributing to those areas of concern. These decisions provide the foundation for creation of a district plan with a limited number (two to three) of focused goals and a limited number (three to five) of focused strategies associated with each goal. At the school level, Building Leadership Teams (BLTs) complete a similar process using a building-level decision framework to review data and identify a limited number of action steps for improving performance to reach district goals.

At **Stage 3** of the OIP, the focus is on implementation of the district plan. Recent research indicates that full implementation of the district plan, based on focused improvement strategies, structures and processes at the district and school level that remain stable over time, has the greatest impact on student achievement. Furthermore, research findings support the effectiveness of DLT structures, supported by BLTs, to perform critical functions and sustain a focus on higher levels of learning for all children across the district.

At **Stage 4** of the OIP, the focus is on monitoring the implementation of the improvement process at multiple levels (classroom, BLT, DLT, regional, state) and its impact on student achievement. Key indicators are customized for each level, while maintaining the focus on essential practices.

At the district level, continuous monitoring by the DLT is necessary to gauge the effectiveness of improvement efforts on student achievement and to ensure a sustained focus on district goals for instruction and

achievement. At the regional and state level, monitoring the OIP is the primary function of regional managers assigned to oversee the work of SSTs who work with DLTs to review data, develop focused plans and ensure fidelity of plan implementation and its effect on instruction and achievement.

Although the Ohio Improvement Process requires a lengthy time commitment, it is a valuable endeavor for districts such as Painesville City Local Schools, another school district in the SST Region 4 that is in the initial year of the OIP. To date, their DLT, comprised of district and school-level administrators, school board members, teachers and parents, is in place. Along with the guidance of SST 4 personnel Candi Hazelwood and Kathy Mrsnik, PCLS has completed its comprehensive data review resulting in a completed DF that identifies key areas that may be impacting performance and academic achievement. Following that process, the DLT identified key areas for focus relating to achievement in reading and mathematics and school climate/expectations.

“We are working right now to refine our goals and define specific action plans necessary to achieve them. Specifically, the math and reading goals focus heavily on helping staff to truly understand the role of assessment in supporting student learning,” says PCLS Superintendent Michael Hanlon Jr.

“It will take extensive training to develop a strong working model of formative assessment FOR learning in addition to the more traditional focus of assessment OF learning,” he continues (referring to the concepts outlined in the work of Rick Stiggins, founder of the Assessment Training Institute).

The district is also exploring ways to more fully engage learners in the school and impact issues of dropout (graduation rate), attendance and behavioral issues.

Hanlon understands that it is too soon for the process to have an impact; however there is much work to be done to roll the goals out to staff and implement the professional development associated with the action items.

“We have been working on many of the concepts that are surfacing in our discussions and planning for some time now. This process will bring greater focus to those initiatives,” he says.

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