

Thinking Skills In Vocational Training

**A Study of Cognitive Change in Inner-City Youth in the
U.S.A.**

Presented by:

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Thinking Skills In Vocational Training

- ❑ In 1991, the U.S. Department of Labor published a document that examined the demands of the workplace and whether U.S. youth were capable of meeting those demands.
 - ❑ This report is named "The Secretary's Commission on Achieving Necessary Skills or SCANS Report."
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Thinking Skills In Vocational Training

The report found that:

- Employers and schools need to do a better job of preparing citizens for 21st century life: globalization of commerce and technology.**
 - Students and workers must work smarter.**
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Thinking Skills In Vocational Training

- Workplace know-how defines effective job performance.
 - Students learn best when workplace skills are learned within the real environment.
 - Students and workers must be prepared to adapt and be flexible to changing conditions.
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Why Thinking Skills In Vocational Training?

- Vocational education provides a real-world context for cognitive development.
 - Vocational education can be a means for acquiring the cognitive skills for a quality lifestyle.
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Thinking Skills In Vocational Training

The SCANS Report established:

□ 5-Competencies

- Resources**
 - Interpersonal**
 - Information**
 - Systems**
 - Technology**
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Thinking Skills In Vocational Training

□ 3-Foundational Skill Sets

- **Basic Skills—3 R's + Listening, Speaking**
 - **Thinking Skills—Creative, decision making, problem solving, visualizing, reasoning, and knowing how to learn**
 - **Personal Qualities—Responsibility, self-esteem, sociable, self-management, integrity, and honesty**
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Effective Strategies to Teach Thinking Skills in Vocational Training

- **Case Study of Vocational Training using Feuerstein's Instrumental Enrichment**
 - **Develops the prerequisites for the development of SCANS 3 foundational skills**
 - **Develops thinking skills necessary for workplace success**
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Case Study for Teaching Thinking Skills in Vocational Training

- Some major goals of Instruments in Instrumental Enrichment (IE)
 - Provide opportunities to perform
 - Differentiation
 - Segregation
 - Organization by restructuring and articulating the field
 - Hypothetical thinking
 - Inferential thinking
 - Visual transport
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Case Study for Teaching Thinking Skills in Vocational Training

- To provide practice in the projection of virtual relationships
 - To help develop perceptual skills to organize and represent objects and events using spatial and temporal elements
 - To develop planning behavior
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Case Study for Teaching Thinking Skills in Vocational Training

- ❑ To provide practice in the use of perceptual processes and perform structural and operational analyses
 - ❑ To provide practice in integration or synthesis
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Case Study for Teaching Thinking Skills in Vocational Training

- Cognitive functions and operations required for environmental training
 - Planning behavior
 - Labeling
 - Transporting
 - Structural and operational analysis
 - Restructuring
 - Systematic search
 - organization
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Case Study for Teaching Thinking Skills in Vocational Training

- Differentiation,
 - Integration
 - Synthesis
 - Spontaneous Comparisons
 - Hypothetical thinking
 - Use of logical evidence
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Case Study for Teaching Thinking Skills in Vocational Training

- ❑ **Description of the Study**
 - ❑ **Where: Chicago, Illinois, USA
DePaul University's Office of Applied Innovations**
 - ❑ **Who: Dr. James T. Kinard, IE Trainer and Environmental Technician Trainer**
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Case Study for Teaching Thinking Skills in Vocational Training

- **Description of Vocational Training**
 - Environmental Technician Training for Hazardous Waste Cleanup
 - **Target Population**
 - Inner city youth and young adults from cities across the U.S.
 - Exposed to environmental toxins, pollutants, and hazardous waste
 - Victims of poor health, poverty, high unemployment, poor education, crime
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Case Study for Teaching Thinking Skills in Vocational Training

- **Goals of the Program for Environmental Technician Training**
 - **To develop the mindset and motivation for focused engagement in environmental training**
 - **To engage students in rigorous thinking and scientific and mathematical inquiry as a catalytic and developmental agent to prepare them for elaboration and understanding of the technical course content**
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Case Study for Teaching Thinking Skills in Vocational Training

- **Goals of the Program for Environmental Technician Training**
 - **To help students become proactive learners and independent thinkers who work to improve the quality of life for themselves, their families, and their community.**
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Case Study for Teaching Thinking Skills in Vocational Training

- **Content of Environmental Training Courses**
 - **Lead-based Paint Abatement Worker Training**
 - **Hazardous Waste Operations and Emergency Response Training (HAZWOPER)**
 - **Asbestos Abatement Worker Training**
 - **Environmental Phase I and Phase II Training**
 - **Underground Storage Tank Removal Training**
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Case Study for Teaching Thinking Skills in Vocational Training

- **Description of Thinking Skills Instruction**
 - **Pre and Post cognitive tests given**
 - **IE with MLE intervention of 1st four instruments**
 - **Bridging or transfer of thinking skills to environmental training courses**
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Case Study for Teaching Thinking Skills in Vocational Training

- Results from combined training sites (six studies):
 - Pre and Post Cognitive Tests
 - Logical Reasoning: Ranged from 219% - 1,504% increase in scores from pre to post
 - Hours of IE Intervention:
 - 15 – 72 hours
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Case Study for Teaching Thinking Skills in Vocational Training

- Coverage of Instruments:
 - Organization of Dots: 55% - 100%
 - Orientation in Space: 10% - 100%
 - Comparisons: 0% - 35%
 - Analytic Perception: 0% - 70%
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Case Study for Teaching Thinking Skills in Vocational Training

□ Summary of Findings:

- As the dosage of IE for level one approaches 70-80 hours with 80%-100% coverage of 4 instruments, a threshold for positive changes in cognitive functioning occurs for youths and adults above 14 years of age.
 - IE with MLE can be used to “prime the intellectual pump and motivational pump”, to engage in technical, scientific, and mathematical inquiry.
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Case Study for Teaching Thinking Skills in Vocational Training

□ Summary of Findings

- There appear to be strong correlations between positive changes in students' cognitive test results and their performance on environmental technician training examinations.
 - Students experienced increased motivation
 - Students demonstrated increased feelings of competency and self-worth.
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