VISIBLE THINKING
A FRAMEWORK DEVELOPED BY PROJECT ZERO | HARVARD GRADUATE SCHOOL OF EDUCATION

Presented by: Jessica Ross
LCEEQ 2.12&13.18
PROJECT ZERO

Making Learning Visible

Teaching for Understanding

Good Project

Good Play Project

He Good Project

Understanding Consequence

Early Project Zero showed an array of passions that still mark Project Zero today. There were at least five passions for the big overtake.
Throughline:
- If, learning is a consequence of thinking, and good thinking is learnable by all students, how can we make thinking dispositional and visible?

Goals:
- Introduce thinking routines and reflect on their, in practice, as a means to reach dispositional goals in and across the content areas.

Agenda:
- Explore a few routines
- Research background: Thinking Dispositions
- Making Thinking Visible
- Routines in the curriculum
- Resources
Purpose and Goals

- Visible Thinking has a double goal: on the one hand, to cultivate students' thinking skills and dispositions, and, on the other, to deepen content learning.

Key Features and Practices

- Thinking Routines
- Thinking Dispositions
- Making Thinking Visible
- Looking at Student Thinking
Thinking Routines with Content Area Artifacts

1. Step Inside: Perceive, Know About, Care About
2. Claim/Support/Question
3. Parts/Purposes/Complexities
4. See/Think/Wonder
5. Looking 10x2
6. Circle of Viewpoints
7. Connect/Extend/Challenge
8. Question Starts
9. Think/Puzzle/Explore
10. Beginning/Middle, or End
Features of Thinking Routines

- Short number of steps, easy to understand and remember (they work “out of the box.” Title of the routine usually says it all)
- Authentically start with, and build on, learners’ own ideas
- Encourage active processing
- Highly transferable across disciplines, contexts, and ages
- Uncover complexity and make it accessible
- Make thinking visible (and audible)
- Leverage the power of collaborative thinking (though can also be used solo)
- Develop thinking dispositions by cultivating intellectual habits of mind.
- Research-based
- Encourage slow looking and learning
From this viewpoint, I think...

From this perspective, I see...

From this angle, I question...
What do you think you know?

What puzzles do you have?

What do you want to explore?
What are its parts?

What are its purposes?

What are its complexities?
Research background: The triadic theory of dispositions
Which dispositions?

VT Thinking Ideals

- Curiosity
- Concern for Truth & Understanding
- A Creative Mindset
How do dispositions develop?

By routinely engaging in specific patterns of behavior — by doing certain things regularly.
**Artful Thinking Palette**

**Reasoning**
What makes you say that?
Claim / Support / Question

**Exploring Viewpoints**
Step inside
Circle of Viewpoints

**Finding Complexity**
Parts / Purposes / Complexities
Complexity Scale

**Comparing & Connecting**
I used to think...now I think
Connect / Extend / Challenge
Creative Comparisons
Headlines

**Questioning & Investigating**
Think / Puzzle / Explore
Creative Questions
See / Think / Wonder

**Observing & Describing**
Beginning / Middle / End
Looking: Ten Times Two
Listening: Ten Times Two
Colors / Shapes / Lines
The Elaboration Game
<table>
<thead>
<tr>
<th>Routine</th>
<th>Key Thinking Moves</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Routines for INTRODUCING &amp; EXPLORING IDEAS</strong></td>
<td></td>
<td></td>
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<tr>
<td>See-Think-Wonder</td>
<td>Description, Interpretation &amp; Wondering</td>
<td>Good with ambiguous or complex visual stimuli</td>
</tr>
<tr>
<td>Zoom In</td>
<td>Description, Inference, &amp; Interpretation</td>
<td>Variation of STW involving using only portions of an image</td>
</tr>
<tr>
<td>Think-Puzzle-Explore</td>
<td>Activating prior knowledge, wondering, planning</td>
<td>Good at the beginning of a unit to direct personal or group inquiry and uncover current understandings as well as misconceptions</td>
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<tr>
<td>Chalk Talk</td>
<td>Uncovers prior knowledge and ideas, questioning</td>
<td>Open-ended discussion on paper. Ensures all voices are heard, gives thinking time.</td>
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<tr>
<td>321 Bridge</td>
<td>Activates prior knowledge, questioning</td>
<td>Works well when students have prior knowledge but instruction will move it in a new direction. Can be done over extended time like the course of a unit.</td>
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<tr>
<td>Compass Points</td>
<td>Decision making and planning, uncovers personal reactions</td>
<td>Solicits the group’s ideas and reactions to a proposal, plan or possible decision.</td>
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<tr>
<td>Explanation Game</td>
<td>Observing details and building explanations</td>
<td>Variations of STW that focuses on identifying parts and explaining them in order to build up an understanding of the whole from its parts and their purposes</td>
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<tr>
<td><strong>Routines for SYNTHESIZING &amp; ORGANIZING IDEAS</strong></td>
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<tr>
<td>Headlines</td>
<td>Summarizing, Capturing the heart</td>
<td>Quick summaries of the big ideas or what stands out</td>
</tr>
<tr>
<td>CSI: Color, Symbol, Image</td>
<td>Capturing the heart through metaphors</td>
<td>Non-verbal routine that forces visual connections</td>
</tr>
<tr>
<td>Generate-Sort-Connect-Elaborate: Concept Maps</td>
<td>Uncovering and organizing prior knowledge to identify connections</td>
<td>Highlights the thinking steps of making an effective concept map that both organizes and reveals one’s thinking</td>
</tr>
<tr>
<td>Connect-Extend-Challenge</td>
<td>Connection making, identify new ideas, raising questions</td>
<td>Key synthesis moves for dealing with new information in whatever form it might be presented: books, lecture, movie, etc.</td>
</tr>
<tr>
<td>The 4 C’s</td>
<td>Connection making, identifying key concept, raising questions, and considering implications</td>
<td>A text-based routine that helps identifies key points of complex text for discussion. Demands a rich text or book.</td>
</tr>
<tr>
<td>Micro Lab</td>
<td>A protocol for focused discussion</td>
<td>Can be combined with other routines and used to prompt reflection and discussion</td>
</tr>
<tr>
<td>I used to think</td>
<td>Reflection and metacognition</td>
<td>Used to help learners reflect on how their thinking has shifted and changed over time.</td>
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<tr>
<td><strong>Routines for DIGGING DEEPER INTO IDEAS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What makes you say that?</td>
<td>Reasoning with evidence</td>
<td>A question that teachers can weave into discussion to push students to give evidence for their assertions.</td>
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<tr>
<td>Circle Viewpoints</td>
<td>Perspective taking</td>
<td>Identification of perspectives around an issue or problem.</td>
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<tr>
<td>Step Inside</td>
<td>Perspective taking</td>
<td>Stepping into a position and talking or writing from that perspective to gain a deeper understanding of it.</td>
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<tr>
<td>Red Light, Yellow Light</td>
<td>Monitoring, identification of bias, raising questions</td>
<td>Used to identify possible errors in reasoning, over reaching by authors, or areas that need to be questioned.</td>
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<tr>
<td>Claim Support Question</td>
<td>Identifying generalizations and theories, reasoning with evidence, counter arguments</td>
<td>Can be used with text or as a basic structure for mathematical and scientific thinking.</td>
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<tr>
<td>Tug of War</td>
<td>Perspective taking, reasoning, identifying complexities</td>
<td>Identifying and building both sides of an argument or tension/dilemma</td>
</tr>
<tr>
<td>Word-Phrase-Sentence</td>
<td>Summarizing and distilling</td>
<td>Text-based protocol aimed at eliciting what a reader found important or worthwhile. Used with discussion to look at themes and implications.</td>
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</table>
What is the role of information?

• A means to deepen understanding: not telling learners what to think, but giving them some information to help them think further and deeper

• Reframing and extending thinking: for learners to develop an understanding that their thinking changes and evolves as they encounter new information

• Encourages and supports active learning (information should be something to “act” on)

• Promotes inquiry: information should not be an end (the “answer”), instead should help expand the inquiry in new directions and lead to new curiosities

• Helps reveal complexity (should not aim to simplify)
Observation Interpretation

Elaboration
Uncovering Student Thinking
To make learning visible

“Documentation serves different purposes during different stages of learning. The criteria for what counts as quality documentation depend on the context”

When deciding what to look at and for what purpose:

Consider **who**: Inside the learning group or outside of the learning group

Consider **when**: during the learning experience or after the learning experience
Study groups: Professional growth and support
To a Friend Whose Work Has Come to Triumph

Title of a poem

By Anne Sexton 1928 - 1974

Poet author and dates of birth and death.

In response to a friend whose work has come to naught.

Agreement with Yeats.

Consider Larkin, passing those sticky wings on testing that strange light tug at his shoulder blade and think of that first flawless moment over the lawn of the labyrinth. Think of the difference it made.

There below are the trees, as awkward as camels, and here are the shocked starlings pumping past and think of innocent Icarus who is doing quite well.

Larger than a sail, over the fog and the blast of the plushy ocean, he goes. Admire his wings! 

Feel the fire at his neck and see how casually he glances up and is caught, wondrously tunneling into that hot eye, who cares that he fell back to the sea?

See him reclaiming the sun and coming plunging down while his sensible daddy goes straight into town.

— Anne Sexton

Student Work

[Image of handwritten text]

[Image of handwritten text]

We the People Constitution

the so called MTV generation is locked in a box by the constant barrage of should and ought by the undertow of popularity of conformity of density and intensity by the need to choose whether to expose the Achilles heel that is your reality or to wear boots by the blur of the line between what and need by the ease of staring at what they say you should be what you don’t want to be by the mass generalization the labels that society embroiders on your sweaters by the box you have to fit into

fit into the community fit into the crowd

Trust of friends

he says as he flips on the TV

Poem is about a lesson of life

— Alexis Kellner-Barker

Poem is about a lesson of life

http://www.poetryfoundation.org/bio/anne-sexton

http://www.uta.edu/english/tim/poetry/as/bio1.html
**See, Think, Wonder in the Early Years**

**Context:** Our Unit of Inquiry is Journeys. It was one of the first times we tried the See Think Wonder Routine. I used a simple and clear picture. I used this routine at the beginning of the Unit, or it was more of an introduction of the Unit.

**Process:** I did the routine with the children on a one-to-one basis in order to receive more authentic answers to the questions. I wrote their answers in speech bubbles.

**Lingering Questions:** What to do with the received information? Should I do something with their wonder? Is there a better way to make the received answers more visible for my not reading 3-5 year old students?

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**See, Think, Wonder in Grade Two**

**Context:** Our Unit of Inquiry is Plants. Students have a weekly observational drawing session in the park to observe changes in their plants. I wanted to implement a familiar routine to new surroundings in order to push them beyond their normal observational process.

**Process:** I held a one-on-one interview-style conversation with four selected students separately using the STW as the format. We have only ever used STW in the classroom using paper. The children and I spoke using phone dictation technology, an option chosen over pen and paper. This setting allowed for spontaneous conversations where students discovered the right photograph.

**Lingering Questions:** What is the thinking routine that has been done better organize my planning so it done more often but not overload.

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**See, Think, Wonder in Grade Three**

**Context:** Our Unit of Inquiry was Rights and responsibilities. The students had a daily writing activity in class to document their thinking about their own ideas of rights. I wanted to combine different thinking routines they already know from their classrooms in German to get the transition between the languages and a clear understanding of what thinking could look like in their mother tongue.

**Process:** I started with the See/Think/Wonder routine in combination with a Gallery walk on the corridor. We used pen and paper for our documentation (pictures on the left). On the next day we presented those pieces in our circle time and figured out how important these rights are. Each student chooses a card and creates his/her own right (picture below). In the following days we displayed our work on the board and on the carpet. We worked on our last bit, a writing picture about important words and phrases about our thoughts (picture on the left side).

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**See, Think, Wonder in Grade Four**

**Context:** Our unit of inquiry was Artists. Students have understood that artist express his creativity and individuality through his art. This was the inquiry into the ways in which we discover and express ideas, feelings extend and enjoy our creativity and our appreciation of the aesthetic.

**Process:** Children explored famous artworks from well-known artists by using the See Think Wonder routines. As children used STW routine over a period of time using different famous artworks, creativity was the main focus of this unit. Children looked at other people's creative works and considered how learning about those could develop their own creativity. Students demonstrated their ability to appreciate and STW activity pushed our children to broaden their thinking and demonstrate their understanding.

**Lingering Questions:** After reflecting back, I thought this activity was bit self-centered. How can we make the same activity more social using more speaking and listening skills? Can we have a pair or 3-4 children doing STW in a group? Would children still be creative and original with their ideas, questions and creativity?
Science: Think-Puzzle-Explore & Chalk Talk

- Focus on learning: The focus of this activity was to elicit the prior knowledge of students and formata meta-understanding of space, earth and the solar system, for me as well as for the students to identify questions and investigate puzzles.
- Making the learning process visible: The students divided their paper into three sections and wrote down their thoughts, puzzles, and explore ideas. They were allowed to draw their concepts about Earth and Space, to write them in two areas that should be addressed in the unit of work as further focus and areas that students did not need much guidance from the teacher. The puzzles may get involved in their thinking process and how they were viewing the unit and activity. The activity was given a window of opportunity for students to expand their thinking about how they could ask questions of a more higher order. By completing their activity, the students were asked to identify their lingering questions with the class, from there class wonder wall was created, following the chalk talk thinking visible activity.

Context for viewers: This content is viewed in the students’ books, which is a reference point for them to reflect back on during and at the end of the unit, to follow with an "I used to think, now I think" VA activity to demonstrate their thinking and learning process. The chalk talk, which evolved a "Wonder wall" displayed on the back wall of the classroom, to not demonstrate a colourful scheme but to make visible the questions and queries brought up by the students. This also provides a reference point, a base and guiding questions throughout the unit of work for students to refer to and reflect on.

Student and teacher reflections: Through sharing of their questions students began to further reflect on each other’s questions and identified that they had similar puzzles and wonders. Students identified that there were many puzzles which lead to an increased excitement in the unit of work. This activity gave visual insights into students thinking on what and what concepts and misconceptions they have about Earth and Space. This provided further direction for the unit of work and areas of focus. It also gave students the opportunity to think for themselves and work out how they could explore their own questions. However, I feel that this is an area that needs to be further addressed and scaffolding to better assist students on how to find out puzzles in a more strategic way, e.g. variety of experiments and specify how they are to be conducted, therefore applying prior knowledge.

Mathematics: Exit Pass: Connect-Extend-Challenge

- Focus on learning: Students were asked to reflect on the module, lesson and identify what they enjoyed, what they didn’t enjoy and what they found beneficial and challenging about learning. This helped students to reflect on what they had learned and what they enjoyed and what challenges they faced. The focus was to identify what students were thinking, what they enjoyed, what they enjoyed learning and what challenges they faced. This activity was based on the context, extend, challenge thinking routine allowed students to process and reflect on their learning. It demonstrated how students think and how they were thinking about specific problem solving strategies in maths.
- Context for viewers: The students’ exit passes were displayed near the door on a poster making this visible for students to see in and out of the room as they move from one activity to another. By making this visible, students were able to see other students’ thoughts and the rationale behind their thinking, which focused on problem solving strategies. Students identified aspects verbally as a class discussion and then wrote down some reflective responses on post it to stick up on a poster as they left the class.

- Making the learning process visible: This allowed all students an opportunity to reflect on their learning in that lesson, to identify areas that are challenging or beneficial to their learning and what they enjoyed/connected with and reflect on. This activity was based on the context, extend, challenge thinking routine to allow students to process and reflect on their learning. It demonstrated how students think and how they were thinking about specific problem solving strategies in maths.

- Student and teacher reflections: This was highlight aspects of the lesson that students could explore to ask more questions. It was important to identify what students were thinking and how and why they were thinking about specific problem solving strategies in maths.

Visual Arts: See-Think-Wonder

In pairs, students completed this thinking routine whilst examining an image of the Aboriginal Burial Poles installation at the National Gallery of Australia.

- Focus on learning: The thinking routine we used on this artefact suitably tied in with the overarching theme of ‘Identity’. Students had previously been studying Aboriginal literature as well as art from different cultures, symbolism and sculpture. Using a 5-T-W routine enabled students to gain further depth of understanding of this theme, focusing on their thoughts and feelings. Some students initially identified it as “enjoyed this lesson and found it interesting” while other students found it challenging as it asked them to consider the context and the thinking process behind the image, which was more complex.
- Context for viewers: Students’ burial pole installations, along with the 5-T-W routine and the feedback from the teacher, enabled viewers to build a comprehensive picture of this creative learning experience.

- Student and teacher reflections: Displaying students’ burial poles in the learning space enabled other students to connect with their visual thoughts to their final product, and feel the process involved in the creation of the final piece. This helped students to build their confidence and self-esteem as the process moved forward. The reflection on the feedback and the process involved in the creation of the final piece enabled students to see the progression and development of their own ideas and thoughts.

- Making the learning process visible: The students’ burial pole installations were displayed in the learning space, allowing other students to see the progression and development of their ideas and thoughts. This not only provided an opportunity for them to reflect on their work, but also to see the progress made by their peers, thus enabling them to learn from each other and gain inspiration.

Physical Education-See/Think/Wonder

- Focus on learning: The purpose of this activity was to provide students with a unique and engaging experience. Students were provided with a scenario and asked to think critically about the situation. The activity encouraged students to share their thoughts and ideas and engage in discussion. The students were provided with a set of questions to guide their thinking and encourage them to consider different perspectives.

- Making the learning process visible: The students were asked to reflect on their experience and share their thoughts with the class. This was done through a discussion where students were encouraged to express their opinions and share their ideas. The teacher facilitated the discussion, asking questions and encouraging students to think critically about the situation.

- Context for viewers: The physical education activity was designed to engage students in critical thinking and encourage them to explore different perspectives. The activity was aimed at developing students’ ability to think independently and creatively. The students were asked to reflect on their experience and share their thoughts with the class. This was done through a discussion where students were encouraged to express their opinions and share their ideas. The teacher facilitated the discussion, asking questions and encouraging students to think critically about the situation.
Thanksgiving Day

CSI: Color-Symbol-Image

**COLOR**
The Feather color is red.

**SYMBOL**
On Thanksgiving, see a turkey.

**IMAGE**
They shech a ham.
Gathering Blue

- Kira is the new weaver
- Kira placed in new home
- Thomas
- Jo
- Matt
- Katrina
- Christopher
- Jamison
- Annabella
- Kira's defender
- Kira's guardian
- Kristen
- Dyes
- Trial to decide if Kira lies
- Killed parents
- Death
- Matt goes young to find
- Matt brings back
- Kira learns there her parents so she comes for
- Skills/Talents
- Very different lifestyles
- Parts of town with no electricity, running water
- Mysterious, secretive mood
- Secrets/Lies
- The populous live in filthy & poor communities while the COG have nice facilities
- Live in with Cinjures
Generate * Sort * Connect * Elaborate

**Process:** The objective of this task was to identify which characteristics materials in the workshop has as a starting point of a design process.

**First step:** The students were asked to think (GENERATE) of a list of attributes of materials that could be useful when creating products. This list based on consensus in the group was documented on the board and used as a key to SORT the images using colour codes. Each student selected their own colour keys and completed their own sheet but could discuss their ideas in the table group while sorting the images.

**Second step:** We physically explored a range of materials, the teacher answered questions about each material and students could refer to the classroom blog for more information on materials, before CONNECTing what they now knew with their previous knowledge - documented by labelling the images further (ELABORATE)

**Student feedback:**
'I think it is really nice to know and think about everything before you plan'
'I have now decided to change the materials I will use because I know more about the materials now'.
'I did not know before which materials can hold screws and about the glues that only work for some materials'
'Knowing what the materials can do, makes it easier to know how to design'.
'It was easy to write a lot about the materials in a short time and it was fun to work with the colours'.
Kimberley O'Driscoll @odmorden · Nov 20
Grade eights launched into the story of #Canada and the decision to unite. #makingthinkingvisible helped get minds-on with the #learning. #visiblethinking #Canada150

Guiding Question: What were the internal and external factors that led to the decision to unite?

Jena Villalba @JenaVillalba · Nov 16
Assessing and reflecting on our views before and after our Socratic Seminar #visiblethinking #sschat #educat

angela tremble @ajtremble · Nov 1
2nd graders talk about friendly numbers and create their own headlines! #sbsedu #sbsdrr #visiblethinking

J. Rafael Angel @JRafaelAngelM · Oct 25
The power of #VisibleThinking! Students looking at all the ideas collected in their service-led unit as they prepare to write their proposals and take action! #MYPChat #ServiceLearning @QAIS_LIVE

MEN OF BIG BUSINESS.
"ROBBERS BARRONS" OR "CAPTAINS OF INDUSTRY"?
"Tug of War"
Reflection

I used to think, Now I wonder...

Artist: Shahzia Sikander
Ready to Leave, 1997
www.shahziasikander.com
Visible Thinking Digital Resources

http://www.pz.harvard.edu/

www.visiblethinkingpz.org

www.pzartfulthinking.org

www.gse.harvard.edu/ppe/program/visible-thinking

http://www.agencybydesign.org/

http://idglobal.gse.harvard.edu/
Thank you!

Artist: Shahzia Sikander
Ready to Leave, 1997
www.shahziasikander.com

jessicarosspz@gmail.com
On August 7, 1965, President Lyndon Johnson signed the Voting Rights Act, one of the most important pieces of legislation in America since the era of Reconstruction. It signaled the victory of a battle that was fought five months earlier in Dallas County, Alabama. On March 25, twenty-five thousand participants—the largest civil rights gathering the South had yet seen—converged on the state capital of Montgomery, concluding a four-day march for voting rights that began in Selma, fifty-four miles away.

James Karales, a photographer for the popular biweekly magazine Look, was sent to illustrate an article covering the march. Titled “Turning Point for the Church,” the piece focused on the involvement of the clergy in the civil rights movement—specifically, the events in Selma that followed the murder of a white minister from the North who had gone down to support voting rights for blacks. Karales’s photograph of this event captured the spirit and determination of civil rights workers during those tense and dangerous times.

As in Emanuel Leutze’s Washington Crossing the Delaware (see 4-A), the participants face human and natural obstacles that stand in the way of heroic action. Karales positioned his camera so that we look up at the train of marchers, who appear to climb some unseen path toward the low, threatening sky as they move resolutely from right to left. As though in defiance of the oncoming storm, four figures at the front of the group march in unison and set a brisk, military pace. In the center of the photograph, the American flag, a symbol of individual freedom and Constitutional rights, is carried by invisible hands beneath a heavy, black thundercloud that appears ready to break.

In the week before Karales took this iconic picture, two unsuccessful attempts to march on the capital had already been made. On Sunday, March 5, the first activists, recorded by television cameras and still photographers, crossed the Edmund Pettus Bridge out of Selma. Horrified viewers watched as unarmed marchers, including women and children, were assaulted by Alabama state troopers using tear gas, clubs, and whips. The group turned back battered but undefeated. “Bloody Sunday,” as it became known, only strengthened the movement and increased public support. Ordinary citizens, as well as priests, ministers, nuns, and rabbis who had been called to Selma by Dr. Martin Luther King Jr., flocked to join its ranks. The second attempt—“Turnaround Tuesday”—which Karales had been sent down to cover, was halted at the bridge by Dr. King before anyone was injured. Finally, six days later, the last march began after President Johnson mobilized the National Guard and delivered his voting rights legislation to Congress.

At first, Karales’s photograph did not receive much exposure or recognition. He was a quiet man who let his work speak for itself. Born in 1930 to Greek-immigrant parents in Canton, Ohio, Karales trained as a photojournalist at Ohio University and then apprenticed with legendary photographer W. Eugene Smith. He worked for Look magazine from 1960 until the magazine folded in the early 1970s, and covered significant events of that turbulent decade such as the Vietnam War, the work of Dr. King, and the civil rights movement. Of all his photographs, it was those of this last group for which he became known, and his image of the Selma march has become an icon of the civil rights movement. It caught the attention of a broad audience when it appeared in the 1987 award-winning documentary series, Eyes on the Prize, which chronicled the history of the movement and acknowledged the role played by the news media in getting the story to the American public.

Karales’s Selma-to-Montgomery March for Voting Rights in 1965 reveals the strength of conviction demonstrated by hundreds of Americans seeking basic human rights. Transcending its primary function as a record of the event, it tells the story of the desire for freedom that is the shared heritage of all Americans. It is also a testament to Karales’s ability to capture a timeless image from a fleeting moment—one that still haunts the American conscience.