

Visualizing Comprehension: A Practitioner-Inquiry Case Study on Sequential Art and Cognitive Load

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The Problem: Cognitive Overload

The “Cold Read” and Working Memory

BOOM!

I looked toward the huge explosion up near the peak of the volcano. Red-hot lava was pouring over the lip of the crater. It was flowing down the face of the mountainside with the speed of a proverbial freight train. And not just any proverbial freight train but a proverbial freight train made of deadly magma and consuming anything unlucky enough to get caught in its path!

“Oh, dagnabbit,” I muttered under my breath. Okay, maybe that’s not exactly what I said, but hey, I’m trying to keep my memoirs G-rated here. Let’s just agree that what I said wasn’t very nice. Then I turned my attention back to the set of wires I was working on. I fiddled with them and then glanced at the computer monitor. Nothing. Well, nothing good, anyway. There was a slight crackle and the sink of burnt ozone, but the monitor just continued to flash its red low-battery symbol. Huh. The small power source in the computer was still putting out a trickle of juice, but nothing was coming through from the other platform.

Double dagnabbit.

I frowned, kneeled down as best I could on my left leg and with my stiff right leg stretched out beside me and got back to work on the connections.

“DUH-NAAAAAAAAAAAAAY!”

Hearing my name being shouted, I jerked my head up and looked toward the treetline.

Rae busted out of the jungle and onto the beach, directly between me and the volcano. She was running full-tilt across the hundred or so meters of sand, right toward me and the platforms. She yelled, “I got them! I GOT THEM! The time has come for us to vacate the premises! That means go go GO GOOOOOO!” And that girl’s got a set of lungs on her, so when I say she yelled, I mean she YELLED!

“Argh! It’s not ready yet!” I hollered back.

“Well, it needs to GET ready at this point in time, or the window of opportunity is likely to be closed forever. In other words, it’s now or never, Sis!” Rae finally reached our OtherWorld Portal equipment and jumped up on the platform to stand next to me. Her bulging canvas rucksack hung from one shoulder.

Prose text from the prologue to
Escape from OtherWorld Island

The Theoretical Framework

Sweller

Cognitive Load Theory

Paivio

Dual Coding Theory

Mayer

Cognitive Theory of Multimedia Learning

Barnwell
Ngo/
Unsworth

Pedagogical Legitimacy

Methodology: The S-STEP Environment

Blue
Group
23 students
"Analytical"

Yellow
Group
18 students
"Social"

Red
Group
23 students
"Energetic"

Green
Group
25 students
"Contentious"

Teacher-as-Instrument *(Cochran-Smith & Lytle)*

The Architecture of Adaptation

The Script Translation

PROLOGUE

PAGE 1

Page Layout: 4 Panels.

- **Panel 1 (Large/Splash):** A wide shot of the volcanic island. The peak of the volcano has just blown. Massive red-hot lava is spilling over the lip, looking heavy and fast.
 - **SFX (Large, jagged):** BOOM!
 - **CAPTION (Danae):** I looked toward the peak. Red-hot lava poured over the lip of the crater.
 - **CAPTION (Danae):** It flowed like a freight train made of magma, consuming everything in its path.
- **Panel 2 (Small/Inset):** Close up on DANAЕ'S face. She is looking up, illuminated by the red glow of the eruption. She looks annoyed rather than terrified.
 - **DANAЕ (Muttering):** Oh, dagnabbit.
- **Panel 3:** Danae is kneeling on the sand next to a complex machine (the Platform). **Visual Note:** Show her right leg stretched out stiffly/awkwardly to establish her physical limitation. She is fiddling with a mess of wires. A monitor on the machine is flashing a RED BATTERY ICON.
 - **SFX:** Fzzzt.
 - **DANAЕ:** Come on... nothing?
- **Panel 4:** Close up of the monitor. It shows a "Low Battery" symbol. There is a small waft of smoke (burnt ozone).
 - **CAPTION (Danae):** The power source is barely trickling. Nothing is coming through from the other platform.
 - **DANAЕ:** Double dagnabbit.

PAGE 2

Page Layout: 5 Panels.

- **Panel 1:** Danae is back to working on the wires, focused.
 - **SFX (From off-panel):** DUH-NAAAAAAAAY!
- **Panel 2:** Danae jerks her head up, looking toward the treeline.
 - **NO DIALOGUE.**
- **Panel 3:** RAE busts out of the jungle foliage onto the sand. She is sprinting full-tilt. She has a heavy canvas rucksack on one shoulder.
 - **RAE (Yelling):** I got them! I GOT THEM!
- **Panel 4:** Rae is running closer, frantic. Danae is still at the machine, looking stressed.

Graphic-novel script from the prologue
to *Escape from OtherWorld Island*

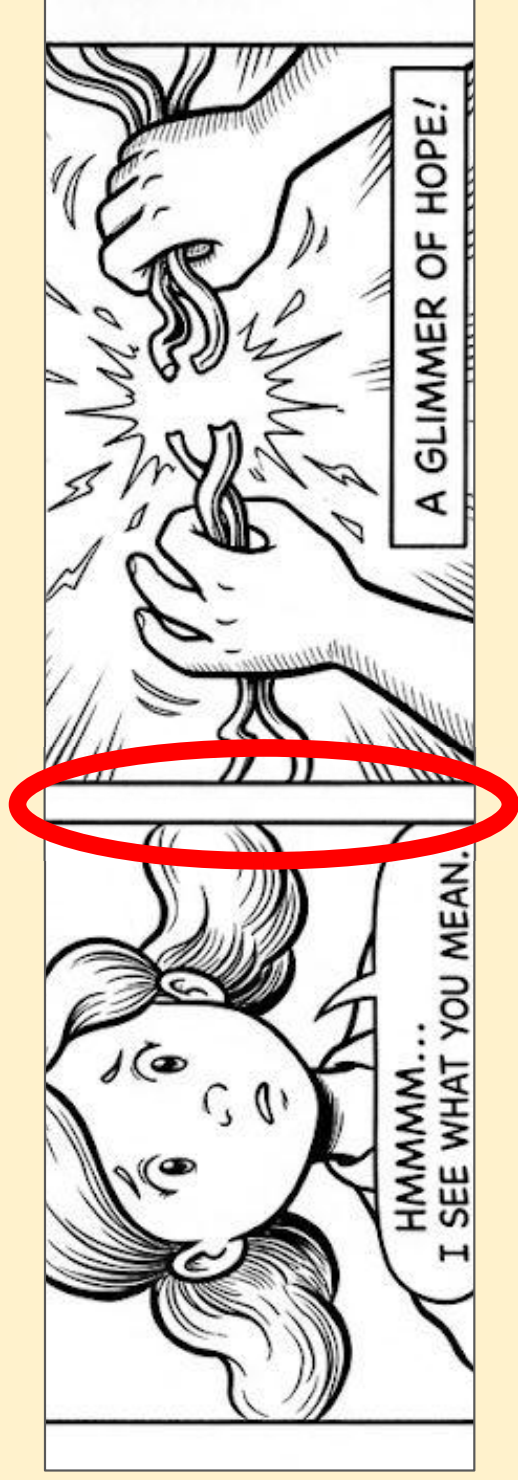
The Gutter as Placeholder

The gutter in graphic storytelling is an innovation in human communication on par with the use of the zero as a placeholder in human mathematics.



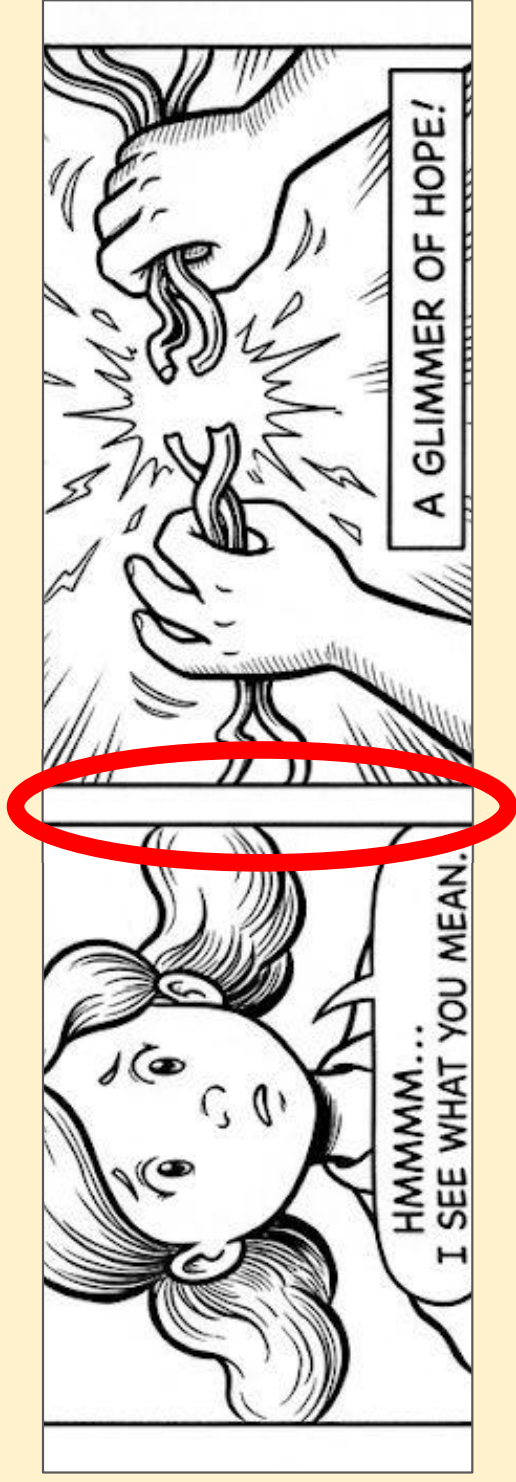
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The Gutter as Placeholder

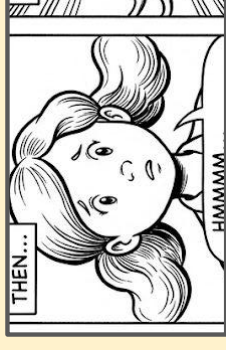
- Observing the parts but perceiving the whole
- Synthesizing time and action across blank space
 - High-level inferencing



Visual Anchors and Schema Activation



**Visual Anchor
(Character):
Leg Brace**



**Visual Anchor
(Character):
Big Fluffy Hair**

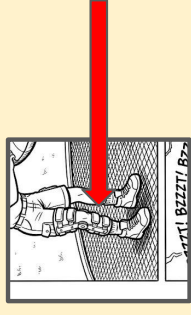


**Visual Anchor
(Setting):
Palm Tree,
Volcano**

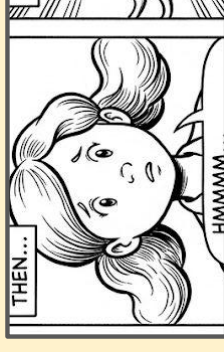
The Filing Cabinet Shortcut

Details from *Escape from OtherWorld Island* graphic novel

Visual Anchors and Schema Activation



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**Visual Anchor
(Character):
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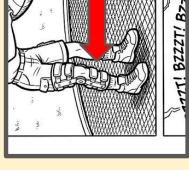


**Visual Anchor
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Volcano,
Palm Tree**

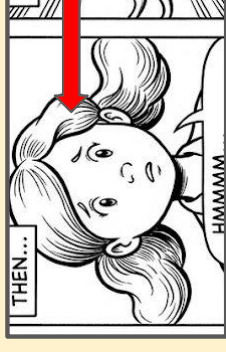
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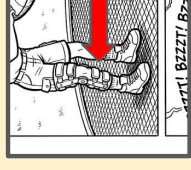


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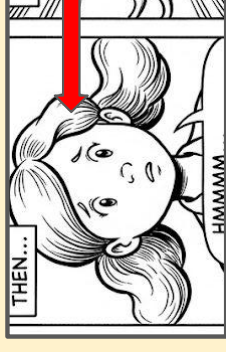
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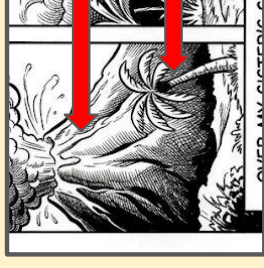
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Practitioner Observations: Sound and Pacing

- SFX as auditory/visual synthesizers
 - Increased independent stamina
 - Intuitive structural analysis

Cohort Dynamics: Micro-Iterations

- Same visual scaffolds across different classes
- Social dynamics vs. Analytical dynamics vs. High Energy dynamics
- Dual-Code lightening of Cognitive Load applicable across all classes

The Practitioner's Verdict

Synthesizing Setting,
Character, and Action



Final panel from *Escape from OtherWorld Island* graphic novel
prologue

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