

Storytelling as an Interactive Learning Medium

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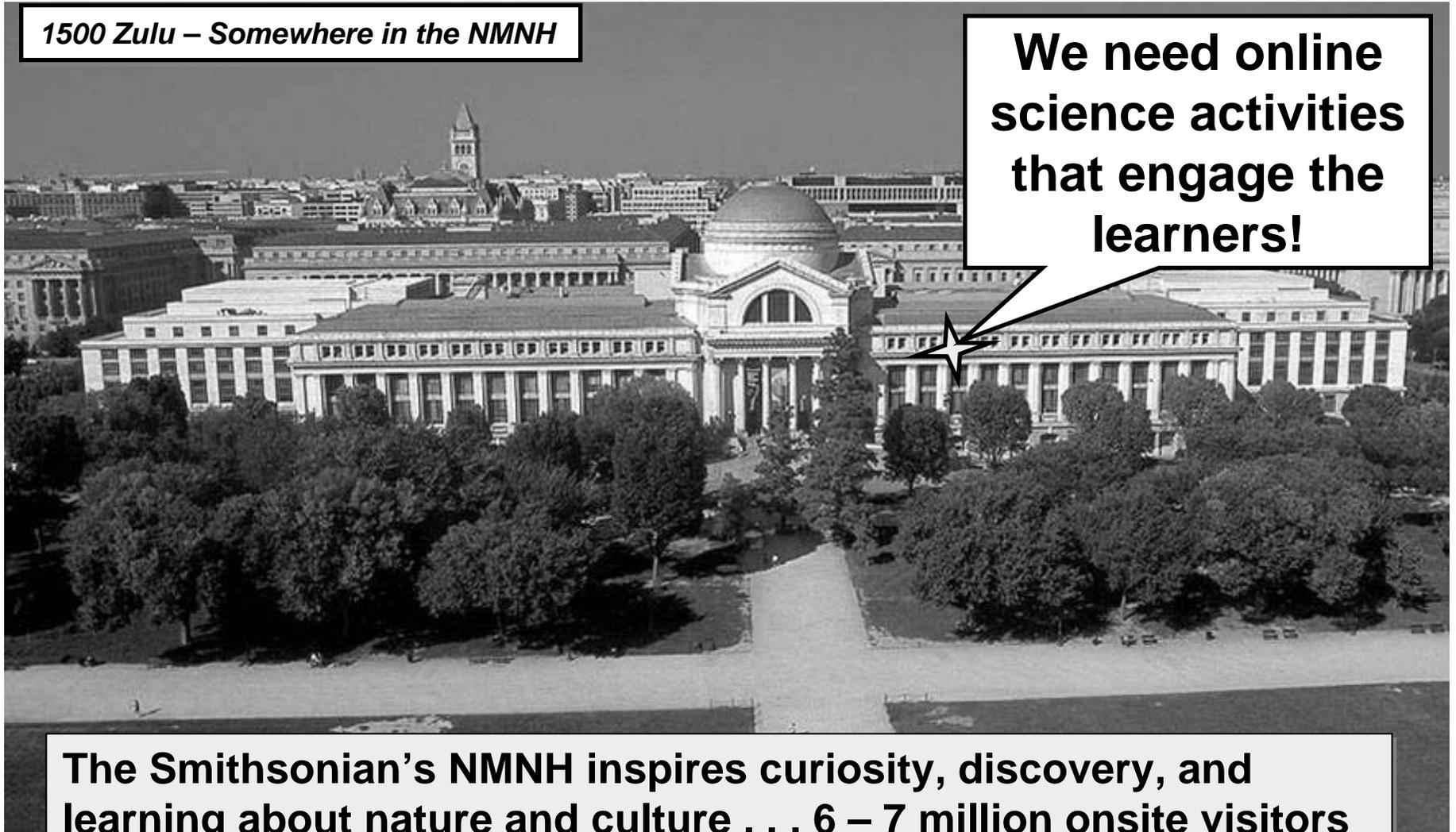
Smithsonian
National Museum of Natural History

The National Museum of Natural History (NMNH) wanted online activities to support an exhibit

1500 Zulu – Somewhere in the NMNH

We need online science activities that engage the learners!

The Smithsonian's NMNH inspires curiosity, discovery, and learning about nature and culture . . . 6 – 7 million onsite visitors and 30 million online visitors in 2008.



The Design Team recommended a technique to motivate the initiation of self-guided activities



Like Serious Games projects, we had to answer questions from stakeholders about the Visual Storytelling approach

- Is storytelling an effective approach?**
- Comic books might work for young males, what about young females?**
- Can we really use comic books for conveying the education/training content to adults?**
- This is complex content, can Visual Storytelling be used for this material?**

What is the most effective method of persuasion for an organization trying to communicate to staff that it really is practicing a policy of avoiding layoffs?

- A) Statistical data alone
- B) A story alone
- C) A combination of statistics and story
- D) A policy statement by senior company executive



Source: Martin, J. and Powers, M.

Visual storytelling helps make your learning stick!

- Improves retention by making oral and written text more concrete
- Supports the construction of a mental simulation of the events and of the spatial relationships
- Enables emotional connections
- Taps into existing visual acuity skills
- Facilitates knowledge construction

Stories are experience simulators.

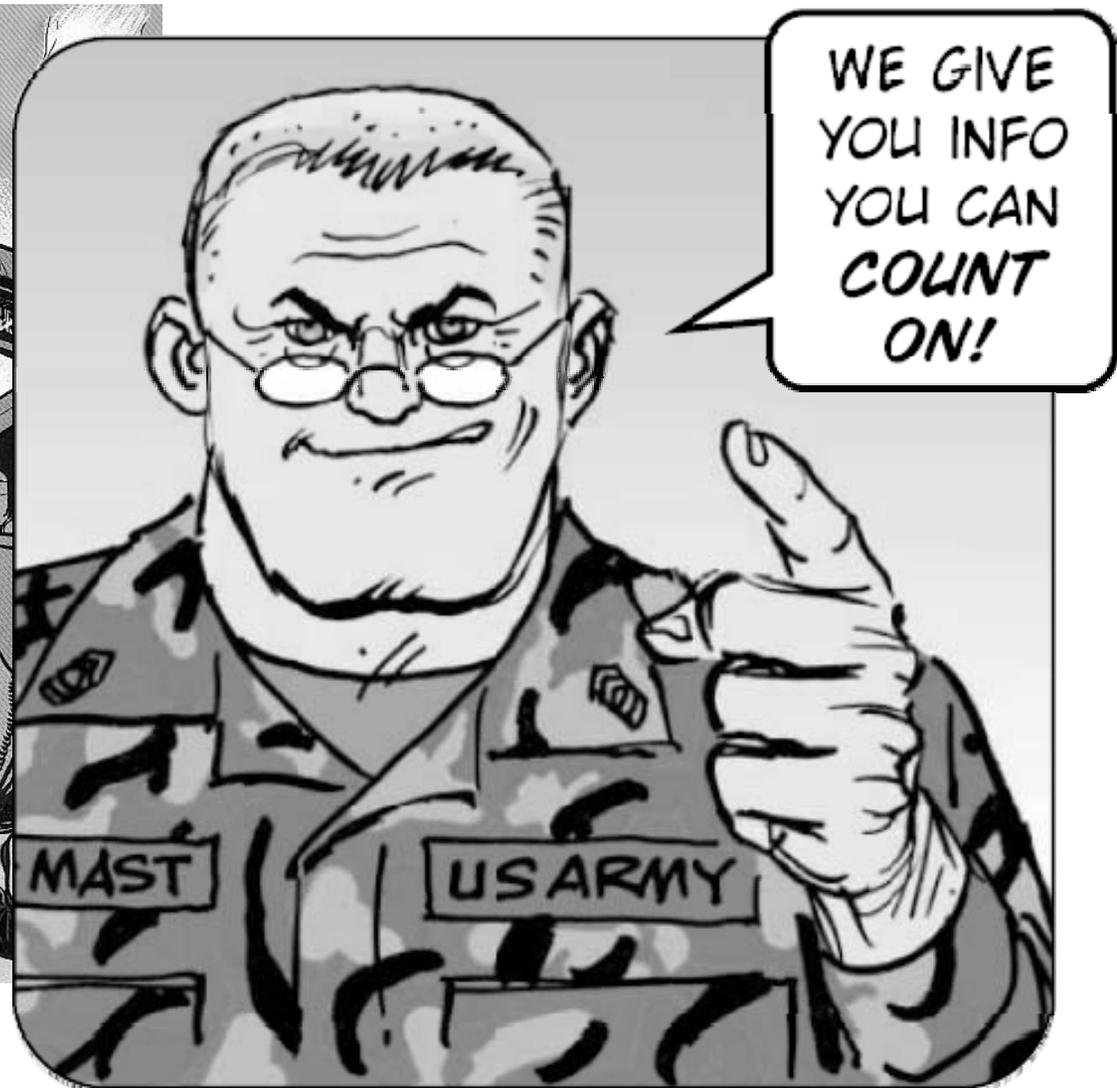
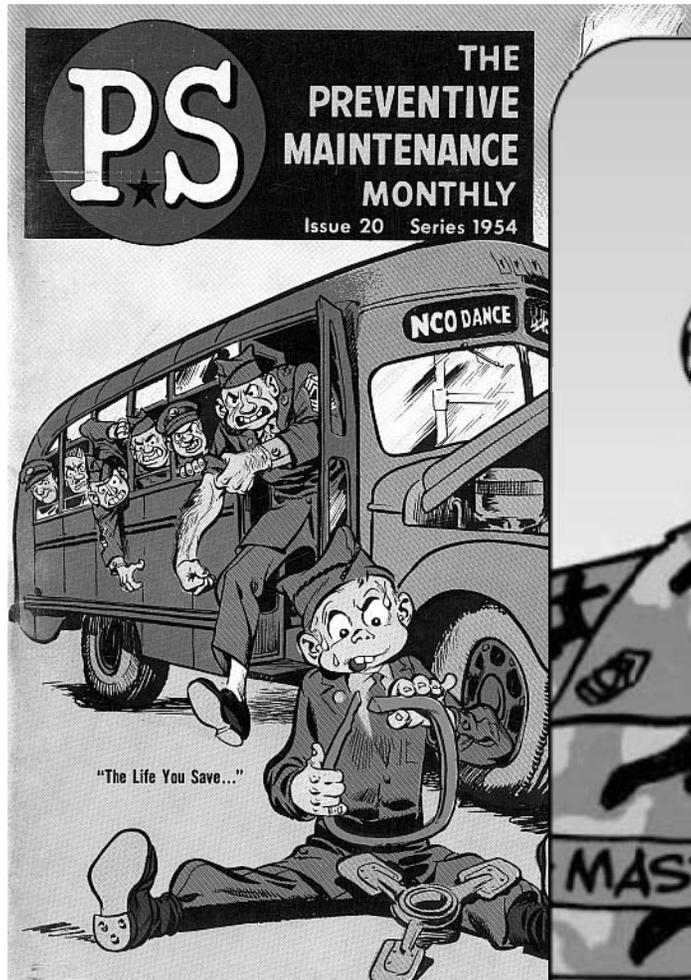
They provide the information, the context, and the models that people need to make decisions.

Readership exploded with U.S. girls once Manga was available in mainstream stores



Barnes & Noble bookstore
Reston, VA

U.S. military has used Visual Storytelling for years



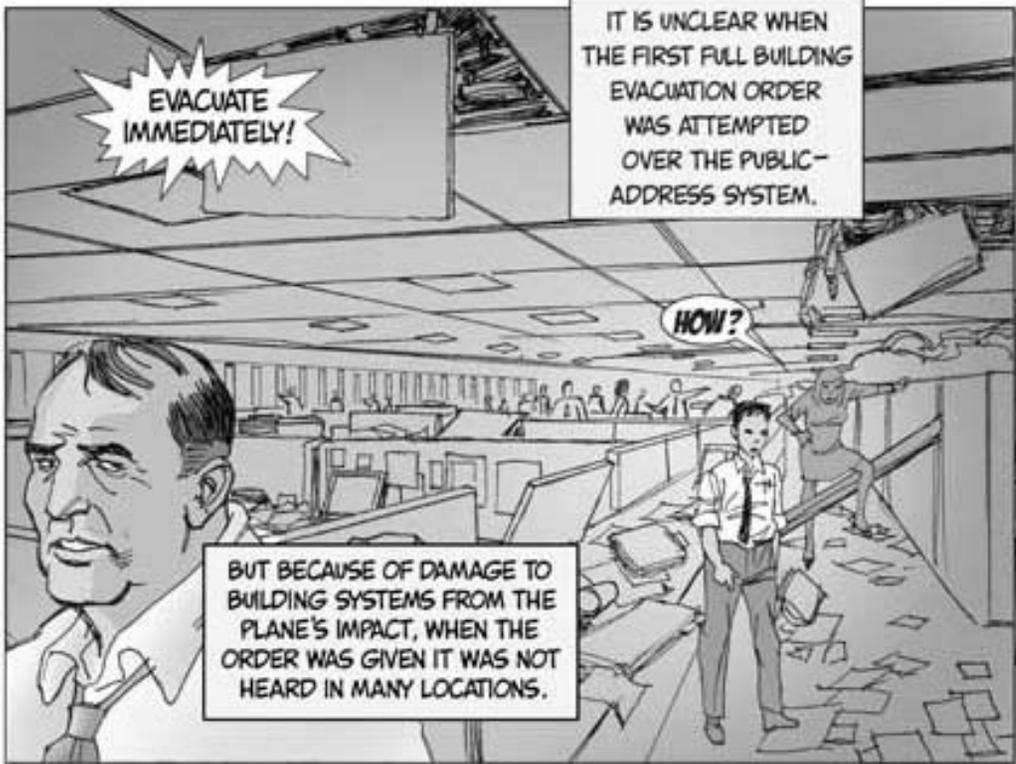
Source: PS 1954 and 2001

ians should stay low, remain where they are, and wait for emergency personnel to reach them. This advice was given to callers from the North Tower for locations both above and below the impact zone. Fire chiefs told us that the evacuation of tens of thousands of people from skyscrapers can create many new problems, especially for individuals who are disabled or in poor health. Many of the injuries after the 1993 bombing occurred during the evacuation.³⁷

Although the guidance to stay in place may seem understandable in cases of conventional high-rise fires, FDNY chiefs in the North Tower lobby determined at once that all building occupants should attempt to evacuate immediately. By 8:57, FDNY chiefs had instructed the PAPD and building personnel to evacuate the South Tower as well, because of the magnitude of the damage caused by the first plane's impact.³⁸

These critical decisions were not conveyed to 911 operators or to FDNY dispatchers. Departing from protocol, a number of operators told callers that they could break windows, and several operators advised callers to evacuate if they could.³⁹ Civilians who called the Port Authority police desk located at 5 WTC were advised to leave if they could.⁴⁰

Most civilians who were not obstructed from proceeding began evacuating without waiting for instructions over the intercom system. Some remained to wait for help, as advised by 911 operators. Others simply continued to work or



EVACUATE IMMEDIATELY!

IT IS UNCLEAR WHEN THE FIRST FULL BUILDING EVACUATION ORDER WAS ATTEMPTED OVER THE PUBLIC-ADDRESS SYSTEM.

HOW?

BUT BECAUSE OF DAMAGE TO BUILDING SYSTEMS FROM THE PLANE'S IMPACT, WHEN THE ORDER WAS GIVEN IT WAS NOT HEARD IN MANY LOCATIONS.



RINNG! RIINGG! RIINNG!

THE 911 PHONE SYSTEM IS SWAMPED!

HOLD ON, PLEASE!

THE 911 SYSTEM WAS NOT EQUIPPED TO HANDLE THE ENORMOUS VOLUME OF CALLS THAT CAME IN BECAUSE OF THE PLANE CRASH.

OPERATORS COULD ALSO NOT KNOWLEDGEABLY ADVISE CALLERS IN THE BUILDING. TOO MANY WERE TOLD TO SIT TIGHT AND WAIT FOR HELP.



WE'VE GOT TO GET EVERYONE OUT OF THERE THAT WE CAN!

AND FROM THE OTHER TOWER, TOO.

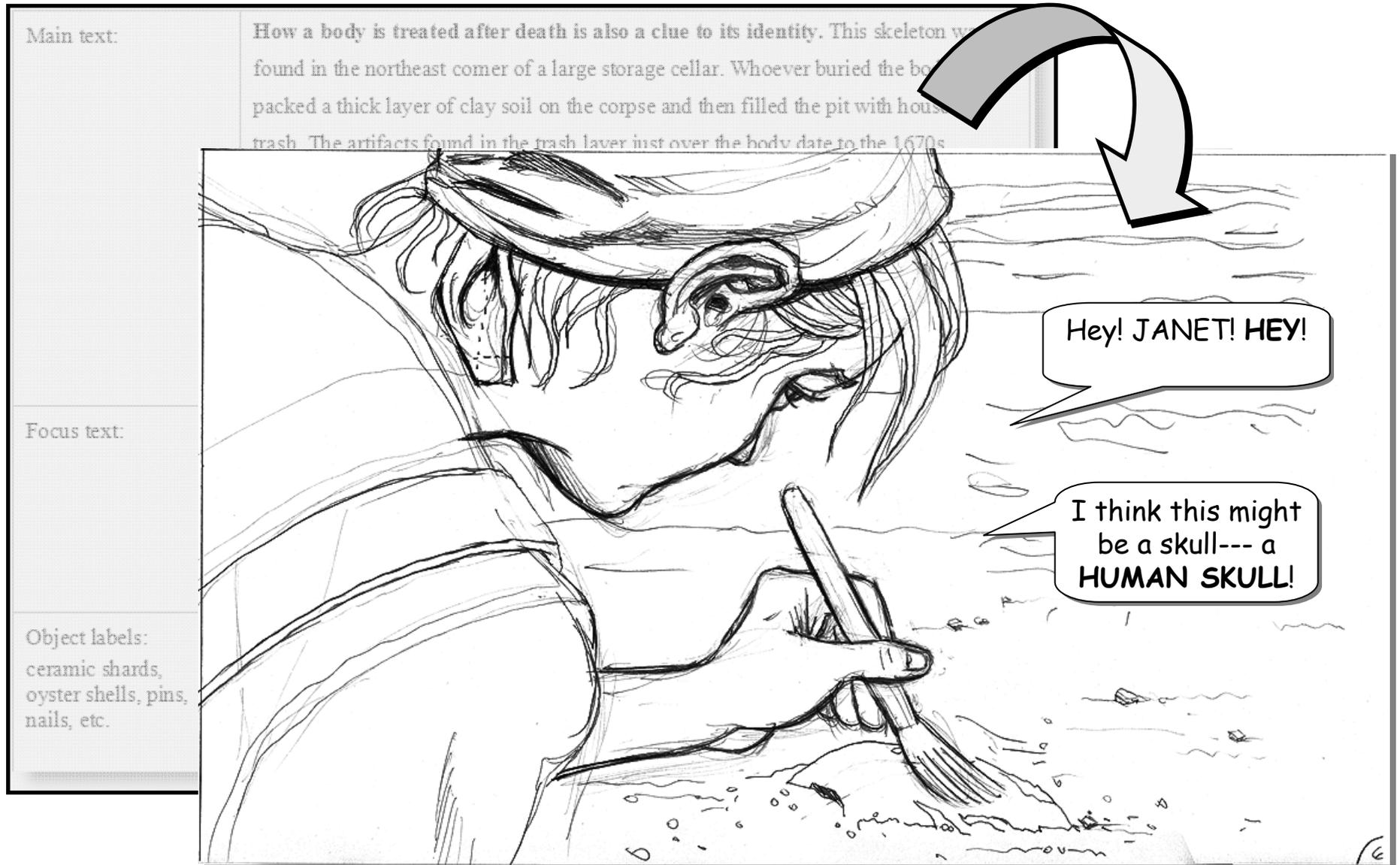


BY 8:57, THEY HAD INSTRUCTED THE PORT AUTHORITY POLICE AND BUILDING PERSONNEL TO EVACUATE THE SOUTH TOWER AS WELL.

LET'S MOVE, FOLKS. QUICKLY BUT ORDERLY.

Source:
The 9/11
Report:
A Graphic
Adaptation

Challenge was to take part of the exhibit script and turn it into an engaging story



What is result of adding very interesting, but extraneous details (e.g., interesting anecdotes and cartoons) to science lessons?

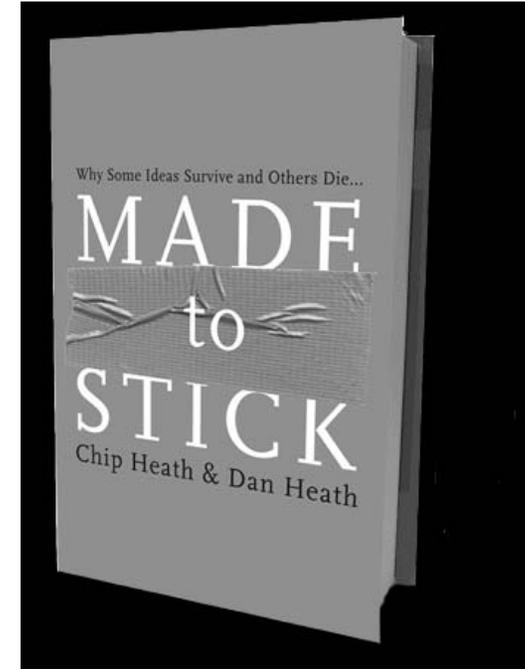
- A) Retention test performance increases
- B) Transfer test performance increases
- C) Transfer test performance decreases
- D) Retention test performance stays the same



Source: Richard E. Mayer, Emily Griffith, Ilana T. N. Jurkowitz, and Daniel Rothman.

Sticky Story **SUCCESS** Checklist

- Simple**
- Unexpected**
- Concrete**
- Credible**
- Emotional**
- Sparks Action (or provides **Solution**)**



Source: Adapted from *Made to Stick: Why Some Ideas Survive and Others Die* www.madetostick.com

As part of the process, we held focus groups with middle and high school students

When: After the rough pencil drawings were done

How: Each character role assigned to a student; read story aloud (no activities)



Great feedback from the focus groups confirmed approach was on target

“At first I didn’t think I would like it. I am not the type of person who likes comic book-type stories, like this one. Luckily, I enjoyed it greatly. I think most of the panels were excellent.”

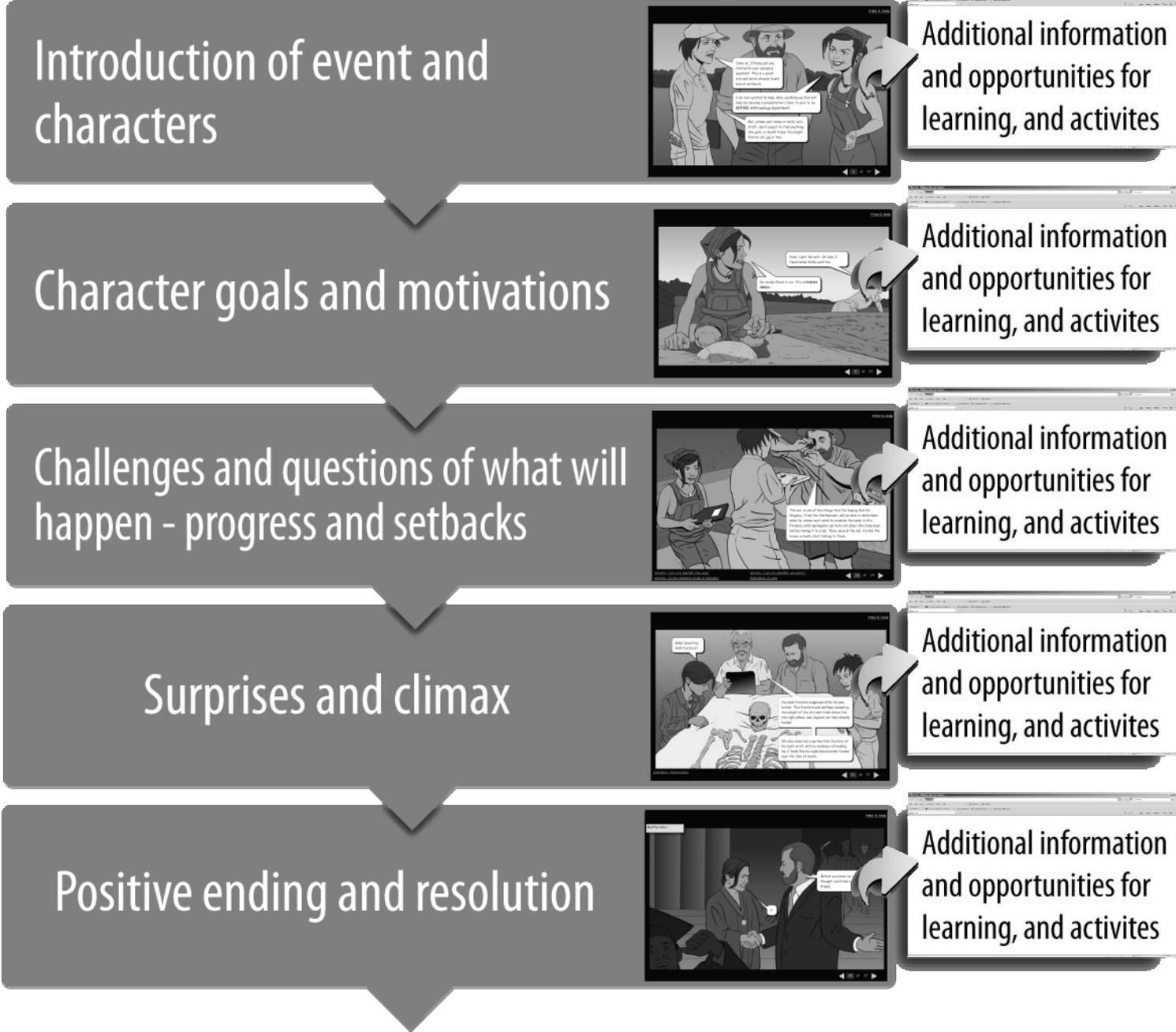
- comment from a female group member



We then developed vector images to be delivered via Flash (low bandwidth)



Applied instructional story framework to single case file



Links access activities and additional information



The sex is one of the things that I'm hoping that Dr. Kingsley, from the Smithsonian, will be able to determine when he comes next week to examine the body in situ. Forensic anthropologists can tell a lot about the body even before taking it to a lab. Then, once in the lab, it's like the bones actually start talking to them.

[Activity: Can you identify the age?](#)
[Activity: Is the skeleton male or female?](#)

[Activity: Can you identify ancestry?](#)
[Definition: In situ](#)

◀ 16 of 37 ▶

Activities allow the learners to view new information and then apply it

 [Print Article](#)

Activity: Is the Skeleton Male or Female?

The pelvis tells the story.

Distinct features adapted for childbearing distinguish adult females from males. Other bones and the skull also have features that can indicate sex, though less reliably. In young children, these sex-related features are less obvious and more difficult to interpret. Subtle sex differences are detectable in younger skeletons, but they become more defined following puberty and sexual maturation.

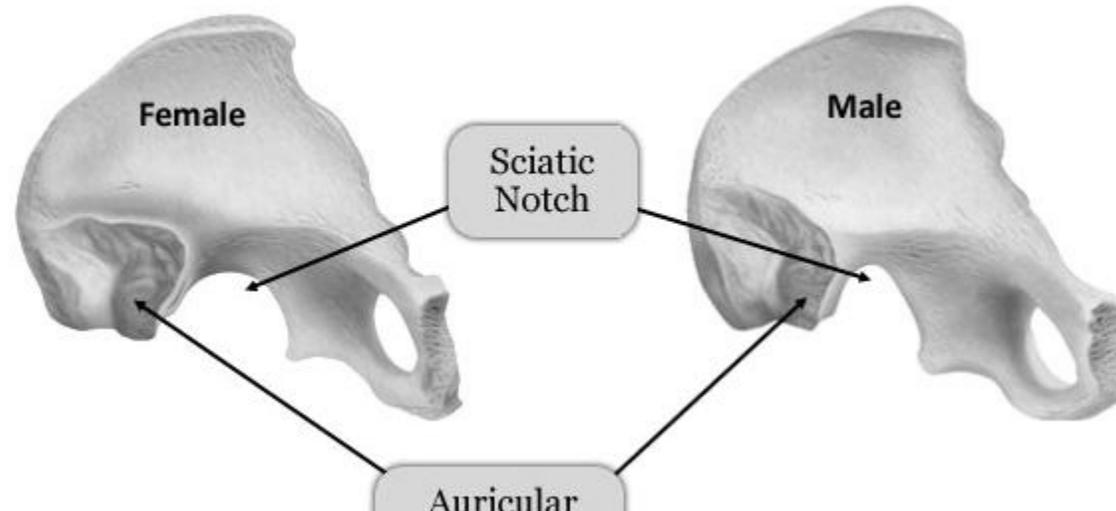
What are the differences? Compare the two illustrations below in Figure 1.

Female Pelvic Bones

- Broader sciatic notch
- Raised auricular surface

Male Pelvic Bones

- Narrower sciatic notch
- Flat auricular surface



We used polling questions to make the activities more of a connected experience



Our audience is very comfortable collaborating as part of an online community.

Figure 2. Pelvic bone of the skeleton in the cellar. (Source: Smithsonian Institution)

What do you think?

Is the pelvic bone of the skeleton in the cellar female or male?

Male

Female

Vote

The social media questions provided polling results and feedback

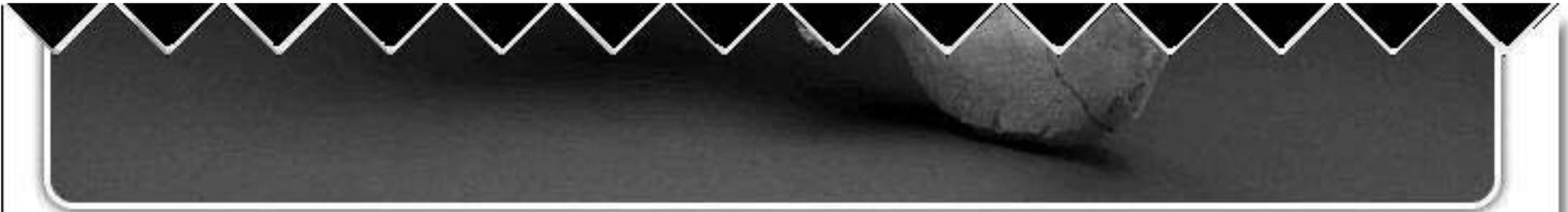
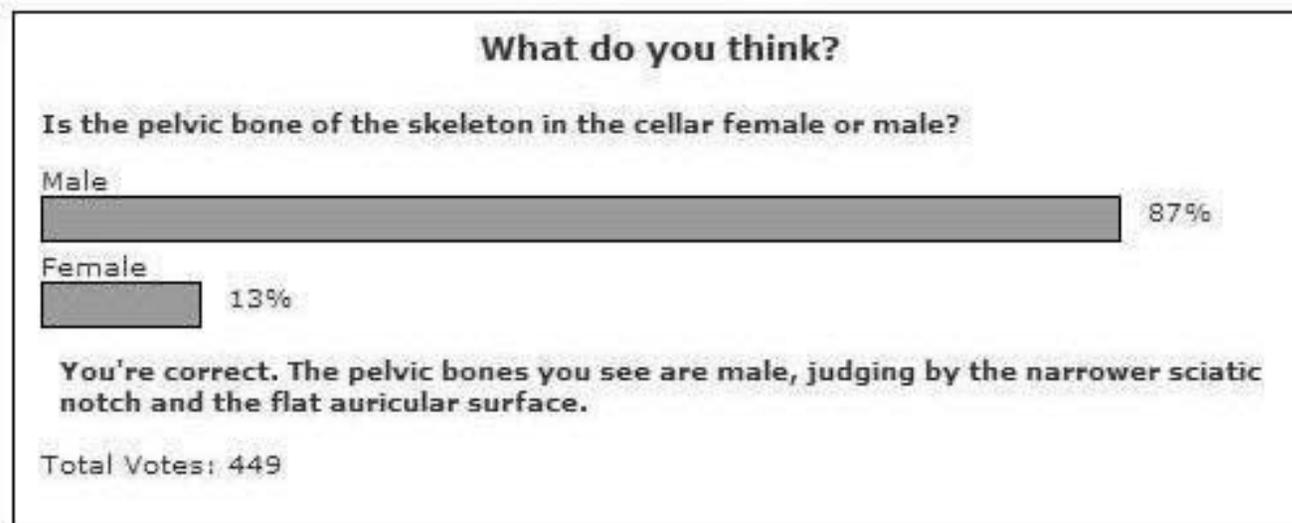
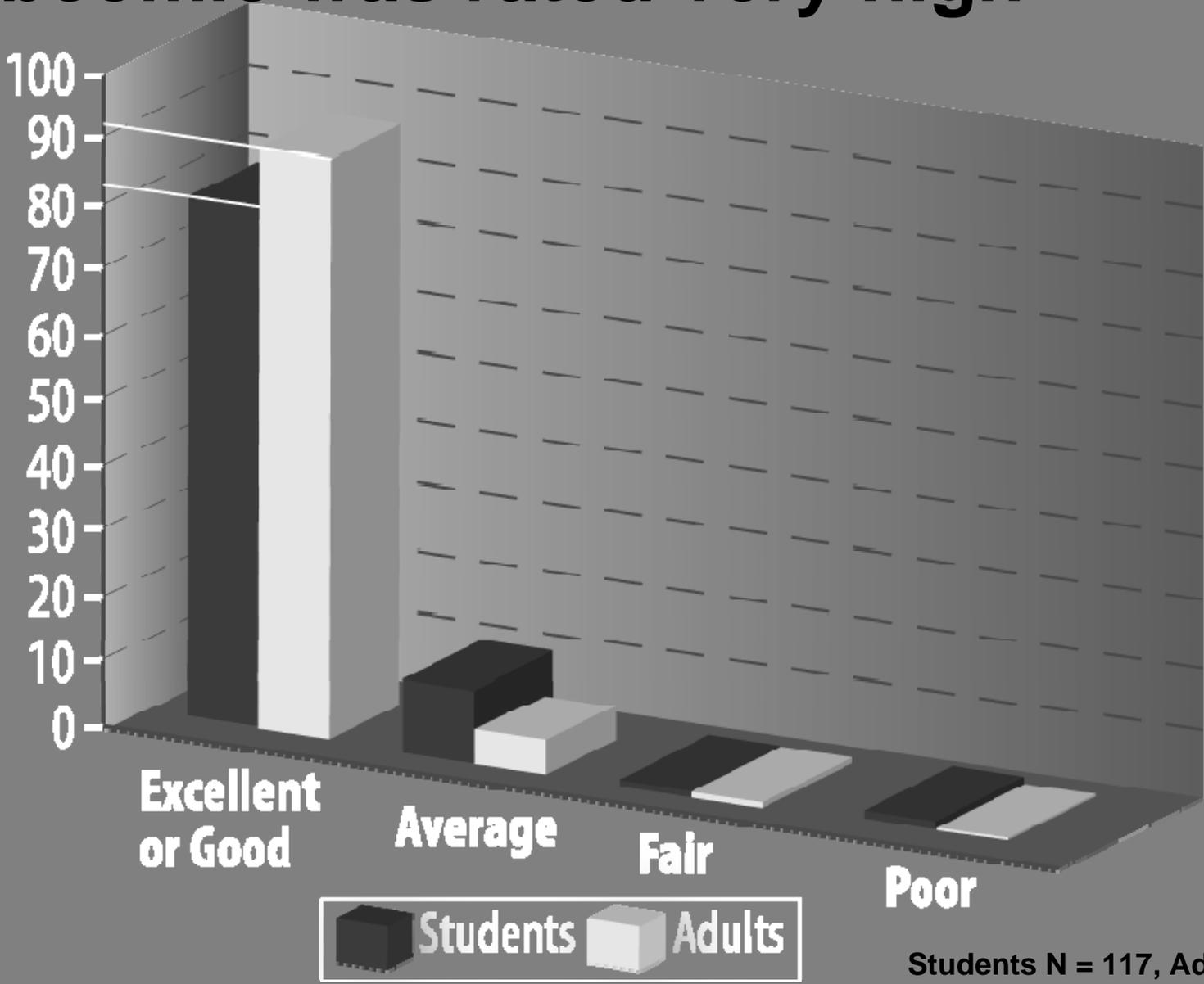


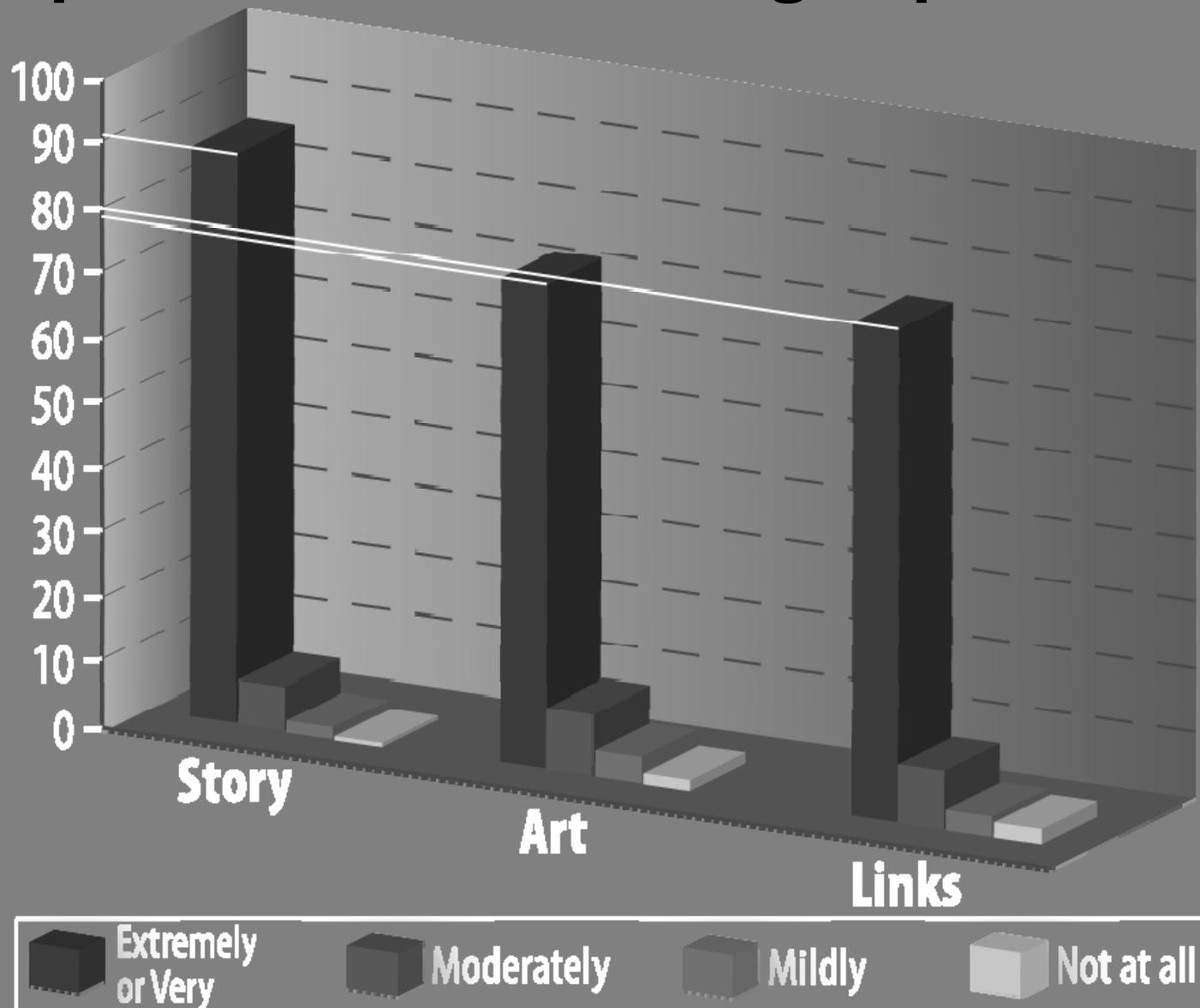
Figure 2. Pelvic bone of the skeleton in the cellar. (Source: Smithsonian Institution)



Overall learning experience with the Webcomic was rated very high



Story was reported as the most important component of the learning experience



Adults N = 221

Impact can be measured by the time learners voluntarily spend with the Webcomic content

“I especially appreciated the links to more extensive information at the bottom of each page.”



the skeleton was removed and the bones carefully collected. They were taken to the Arundel County Annapolis, Maryland. After cleaning and documenting, the remains were transferred to Dr. Owsley at National Museum of Natural History.

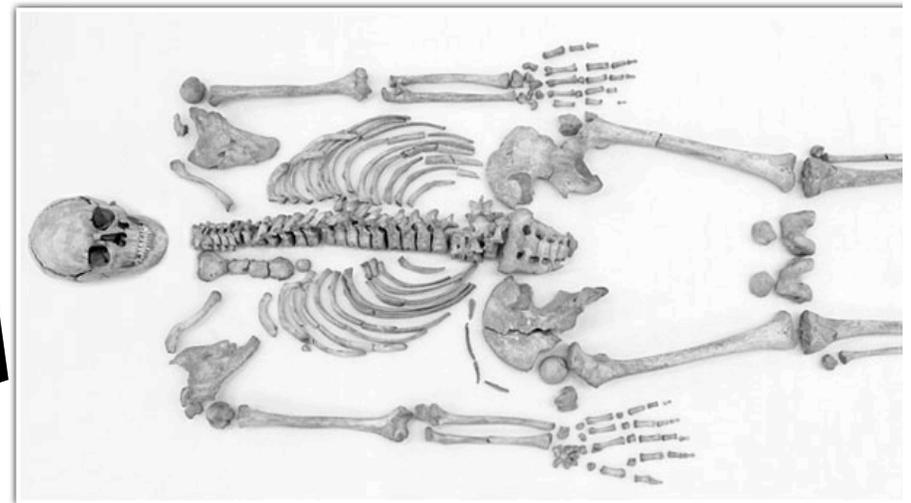


Figure 5. Skeleton in the cellar arranged in anatomical position. (Source: Smithsonian)

The Forensic Evidence: a Wretched Life and Violent Death

Dr. Owsley's team examined the remains for forensic evidence and found a number of telling conditions. The skeleton was examined to identify the individual (i.e., determine age, sex, ancestry) and compare the known about any people associated with the property around the time of death. Forensic analysis was information on the health of the person, his/her activities during life, and the cause of death.

The body matched the developmental growth pattern of a male, about 16 years old, of European descent. Growth plates on the long bones, permanent tooth eruption, and the shape of the pelvis and skull were

The Webcomic provides the motivation and means to access content and activities

*“At first, I thought sound might help. However, on second thought, it would prohibit the student from focusing on the **PROCESS** of learning, which I believe is the goal of Education; I think it was a job **WELL DONE!** “*



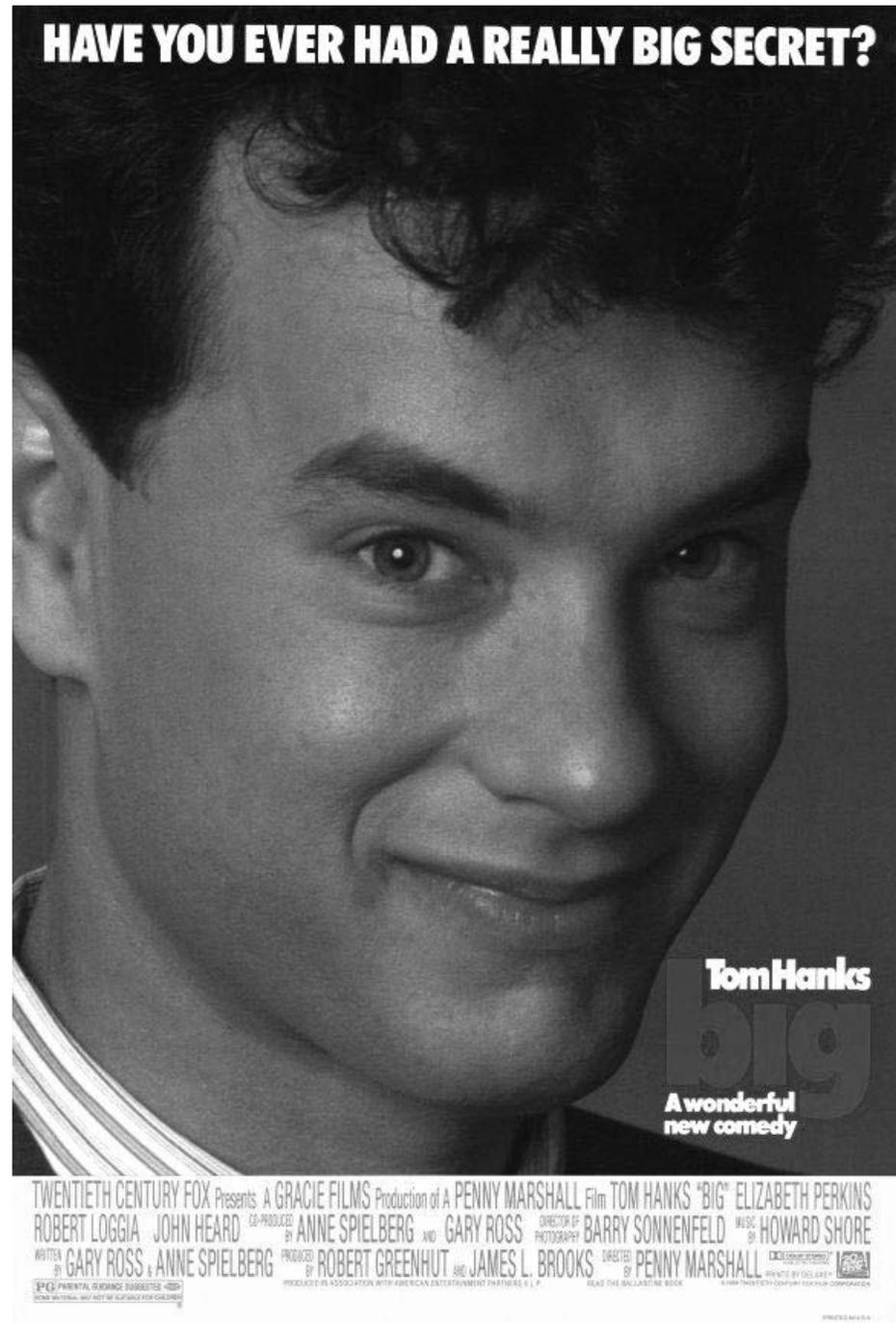
The image shows a screenshot of a Facebook page for a character named Ana. The page header features the Facebook logo and a 'Sign Up' button. Below the header, there is a profile picture of Ana, a cartoon illustration of a woman with dark hair tied back, wearing a headscarf and a necklace. To the right of the profile picture, the page name 'Ana- The Forensic Anthropologist' is displayed, along with navigation tabs for 'Wall', 'Info', and 'Photos'. Below the profile picture, there is a text box that reads: 'Ana is a character in the Smithsonian's Webcomic - The Secret in the Cellar: A Written in Bone Forensic Mystery from Colonial America. The link to the Webcomic is below.' To the right of the profile picture, there are three posts. The first post is by Bartley Collart, who says 'I enjoyed the guest by the physical Written especially the lab. The lab tec 10 minutes ago · Report'. The second post is by Joan Blinn Lynn, who says 'I recently vi the 'Written In Bone' exhibit. \ that as a mother, I found the touching....Read More ▾ August 3 at 2:15pm · Report'. The third post is by Ana- The Forensic Anthrolog, titled 'Forensic Friday at the Smith', with the time '1:00PM Friday, July 31st' and location 'National Museum of Nat'.

Once you have a good story, you can share it multiple ways.



**What was
Tom Hanks
character's
big idea in
the 1988
movie BIG?**

**An electronic
comic book
that allowed
users to make
decisions.**



Source: 20th Century Fox

The Smithsonian Webcomic shows that Visual Storytelling is

- **Effective**
- **Accepted**
- **Accessible**
- **Achievable**

Think about how you could use Visual Storytelling on a project to simulate an experience.

Do you have questions for the core team?



Links to the Webcomic and references:



http://delicious.com/Visual_Storytelling