

UNIVERSITY OF
BATH



**7TH INTERNATIONAL CONFERENCE
ON PUBLIC COMMUNICATION OF
SCIENCE AND TECHNOLOGY (PCST)**

Science via Narratives

Communicating science through literary forms

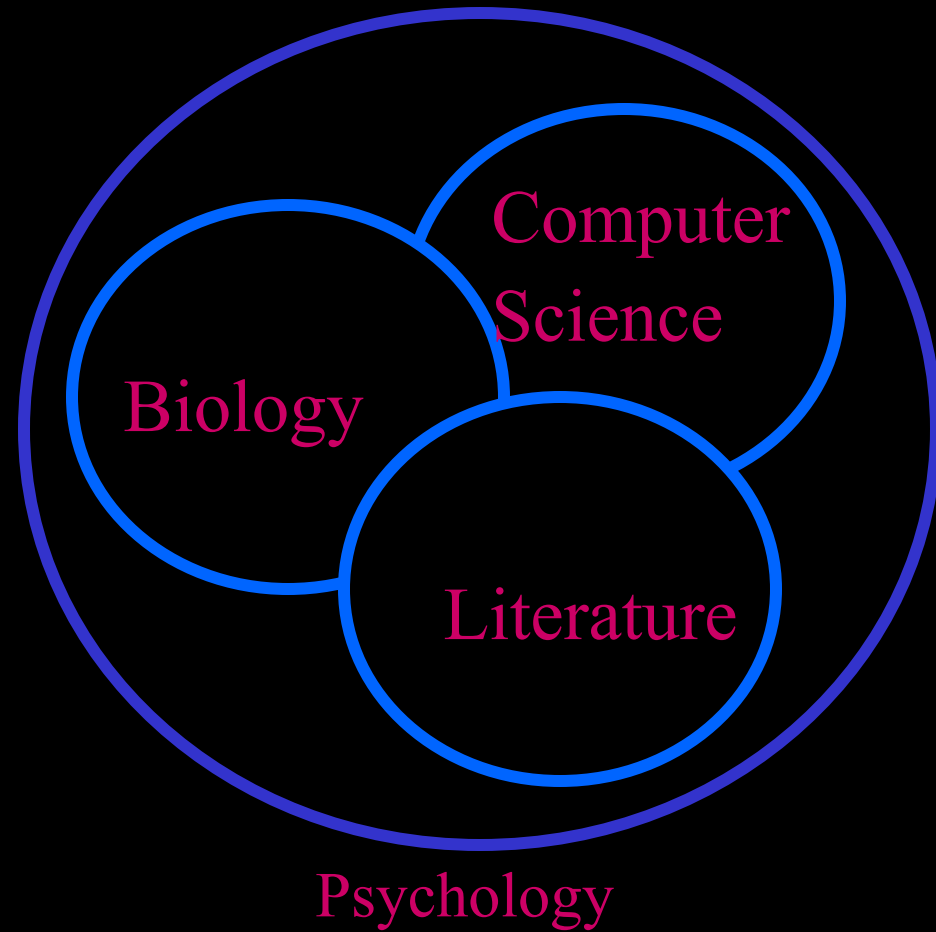


- Can we remember scientific information included in fictional stories?

Aquiles Negrete-Yankelevich

Science via Narratives

Communicating science through literary forms



Aquiles Negrete-Yankelevich



- **Research Question** (The Plot)
- **Background** (Why it is interesting?)
- **Methodology** (How I am studying it?)
- **Findings** (What I found)
- **Conclusion** (My interpretation)

Fact via Narratives



Research Quest.

- Can we communicate science through fictional narratives?
- What are the differences of learning through factual texts *versus* fictional stories?



Background:

Science Education

- Science textbooks have been privileged over other means in science education, but in fact science and technology are represented in the media such as radio, television, magazines as well as in music, cinema and a diversity of examples in fictional literature (Gough 1993, Appelbaum 1995, Weinstein 1998 and Weaver 1999).
- If we are to educate society in and about science as Nunan and Homer (1981) propose, we have to treat all of the cultural media of science equally.

Fact via Narratives

Background:

Challenge of Science Communication:



Establish a bridge between science and the general public.



Translate science into common language so the reader becomes interested and excited.



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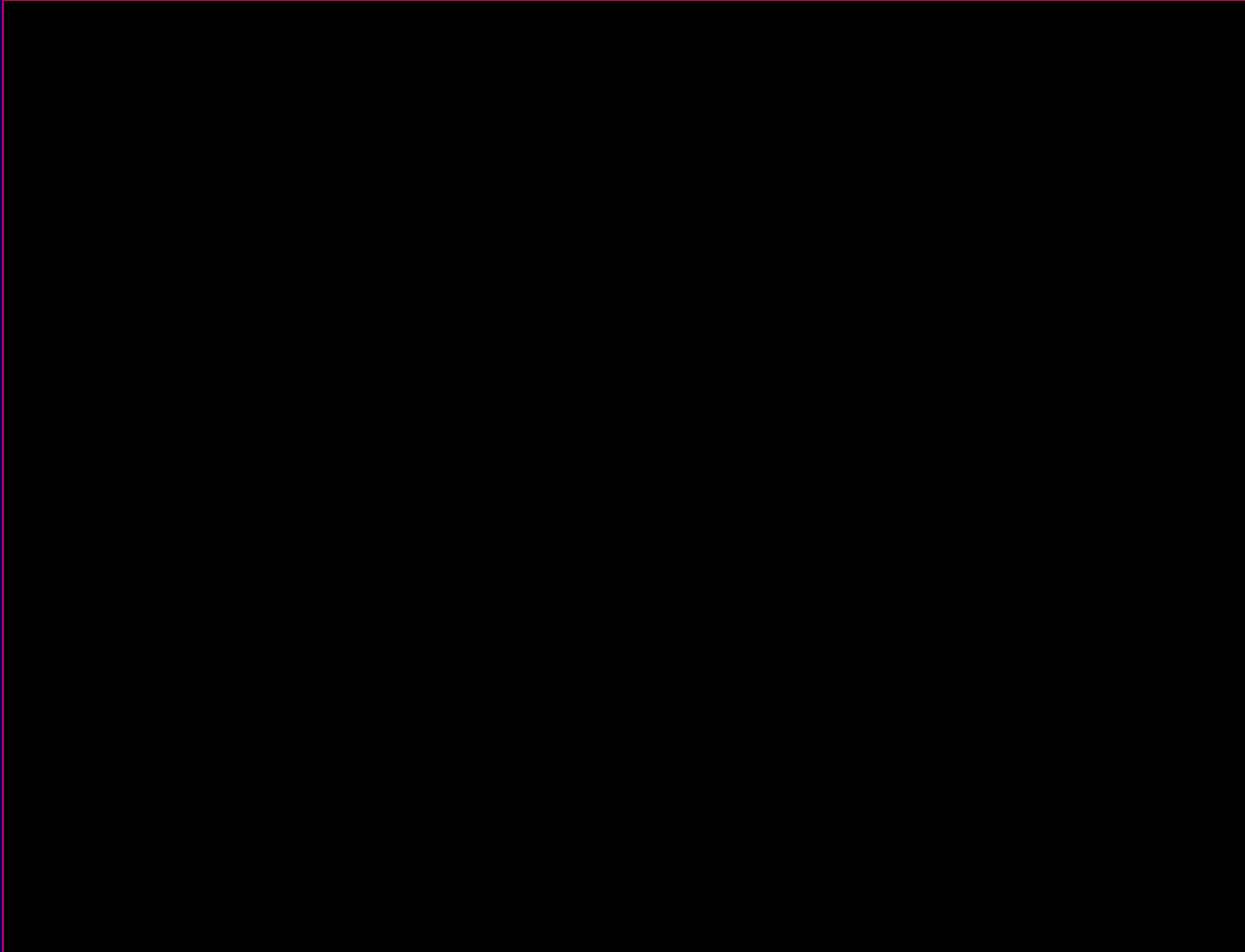
Methodology :

- Two short stories with scientific content were adapted to be no more than 2 A4 pages.
- Questionnaires were used to evaluate the amount of scientific information individuals learnt from the stories (measured through memory tasks: recognise, recall and contextualise. Stainberg 1998).

Fact via Narratives

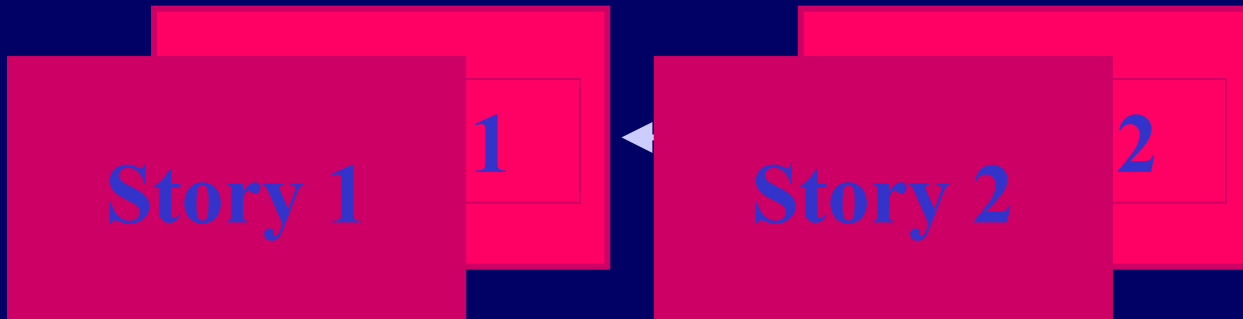
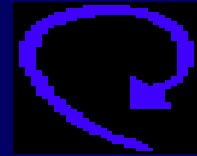
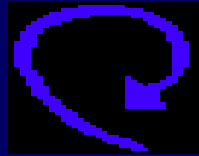


Study:

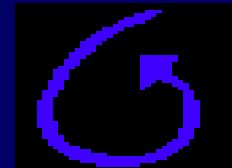
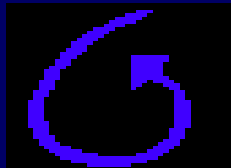
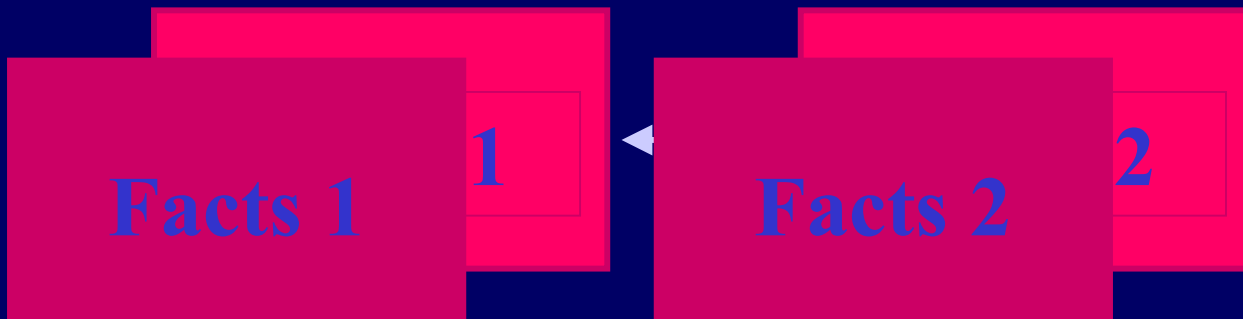


Fact via Narratives

Study: Design



One week later



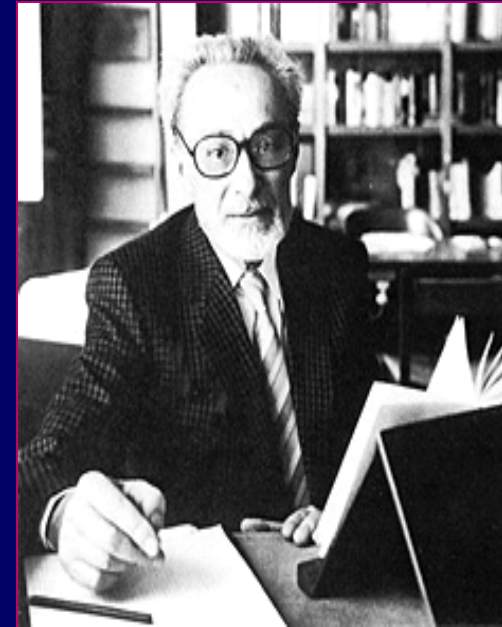
Fact via Narratives



Study:

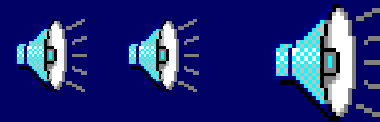
The Stories:

- Nitrogen by Primo Levi



- The Crabs Take over the Island by Anatoly Dnieprov

(Narrated by: Irwin Scott)

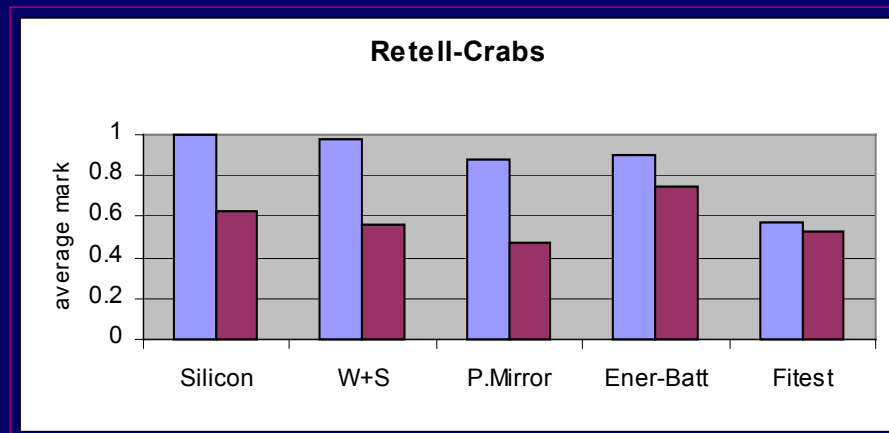
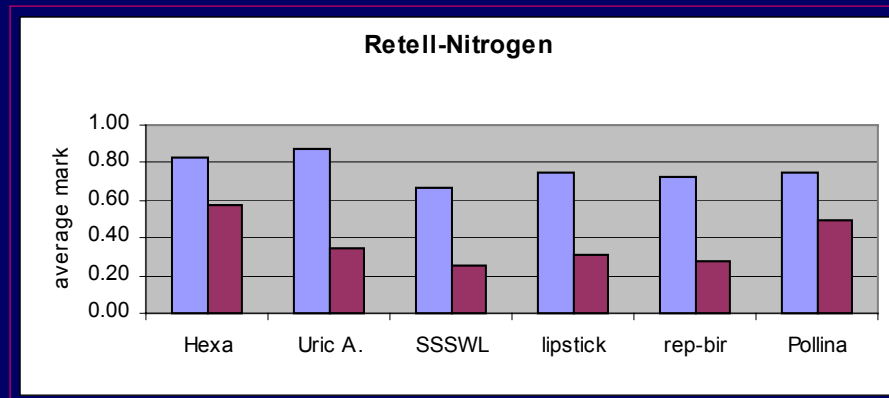




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Differences in time:

Facts 1



Stories

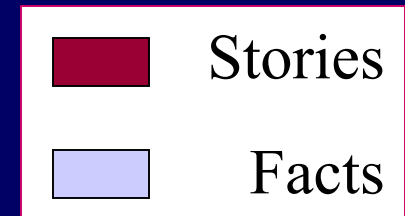
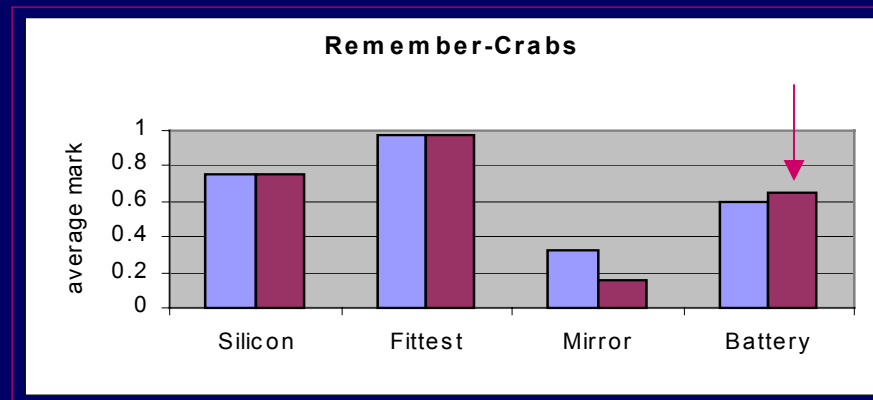
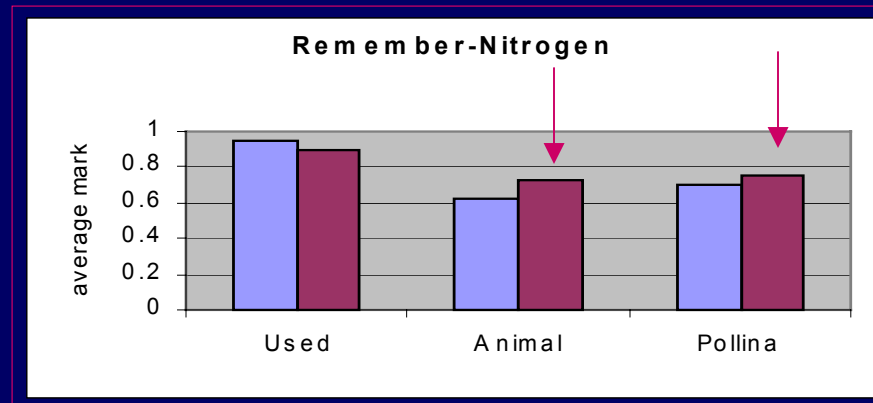
Facts

Fact via Narratives



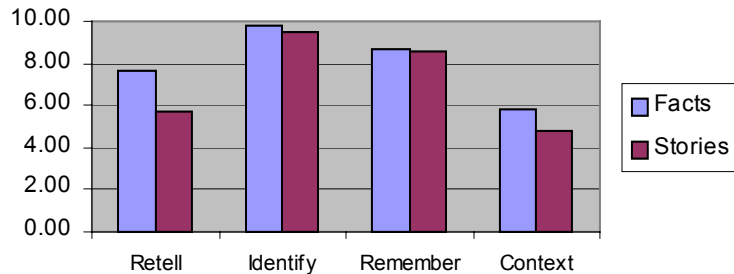
Study:

Differences in time:

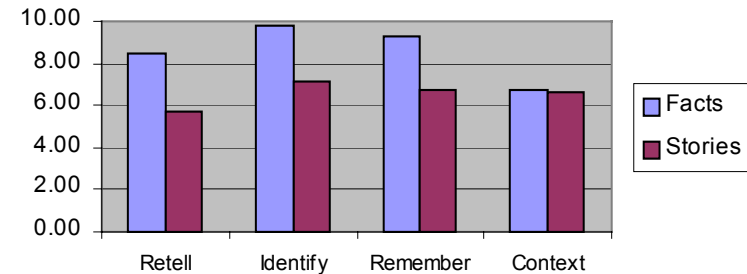


Stories versus Facts in time :

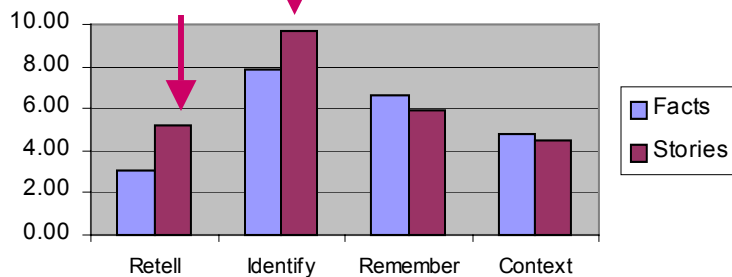
Stories vs Facts Nitrogen W1



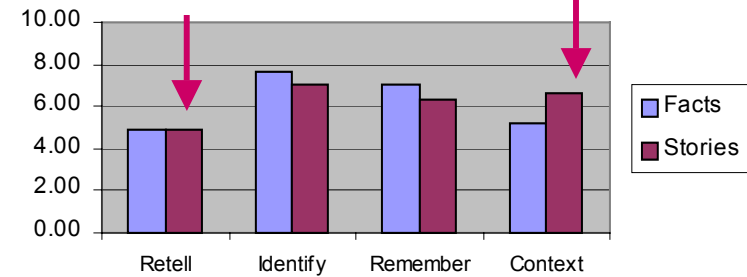
Stories vs Facts Crabs W1



Stories vs Facts Nitrogen W2



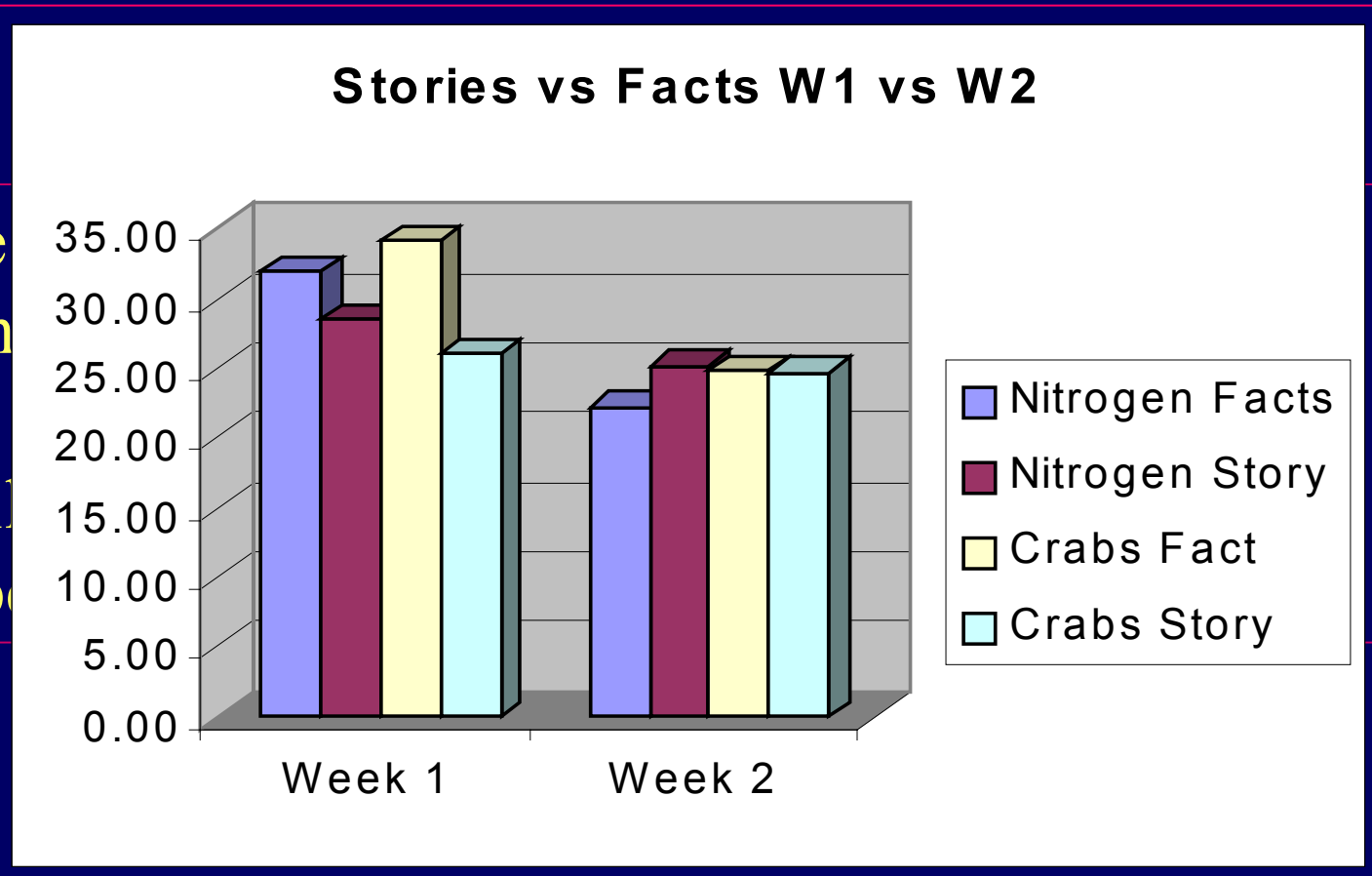
Stories vs Facts Crabs W2



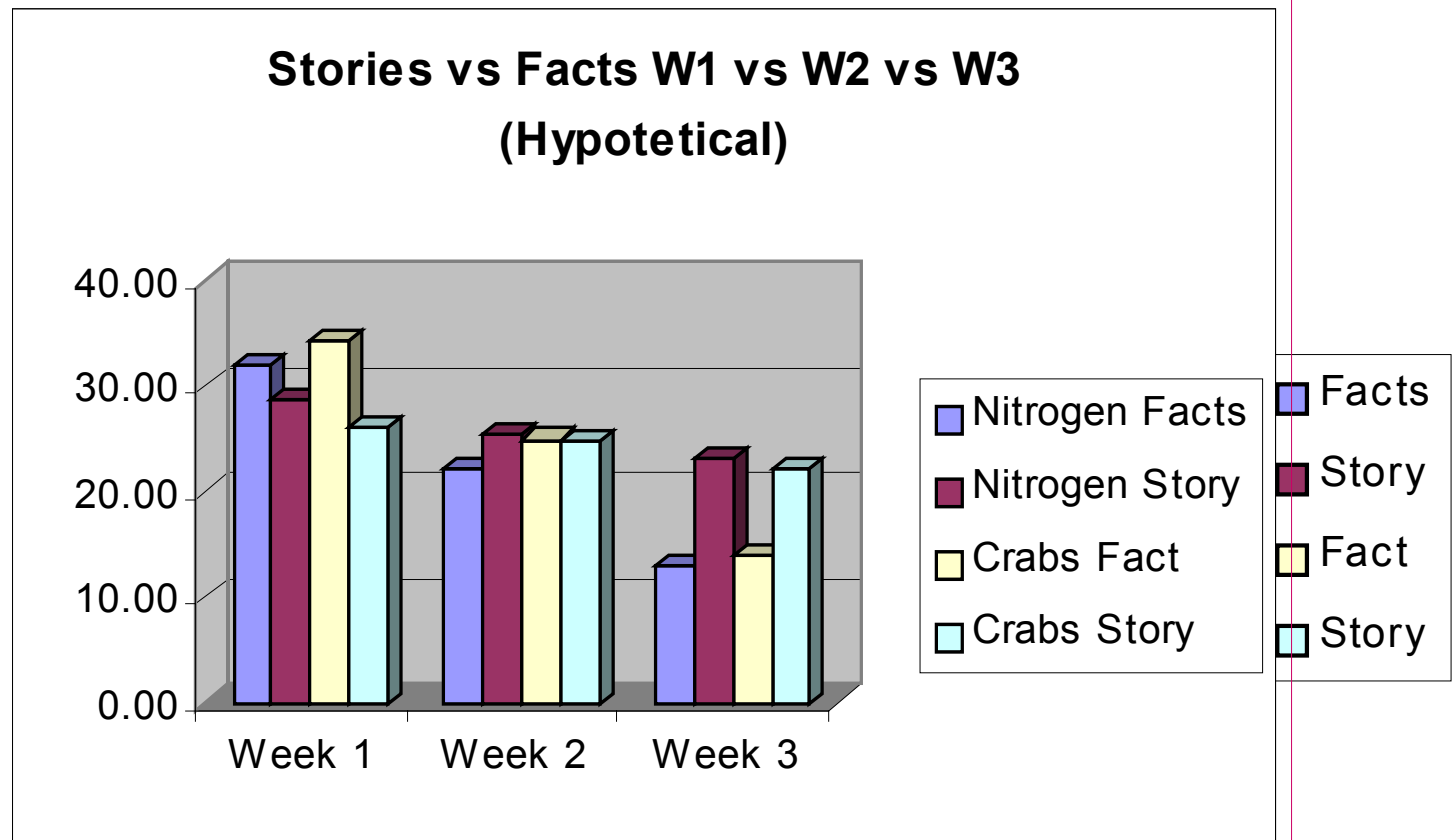
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Stories versus Facts in Time :

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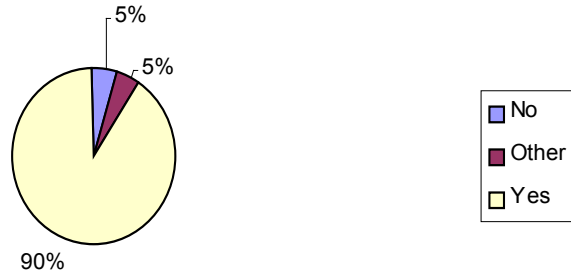
Stories versus Facts in Time :



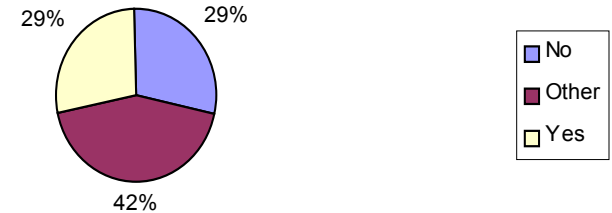
Do you believe that you can learn some science through the stories and what is scientific knowledge and what is fiction?

Learn - Narrative Group

Fiction vs Science Narrative Group



Fiction vs Science - Factual Group





- Research Question (Plot)
- Background (Why it is interesting?)
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Fact via Narratives



Discussion and Conclusion:

The results of this study as a whole suggest that:

- Science can be learned through literary stories and that this represents an important means for science communication to transmit information in an accurate, memorable and enjoyable way.
- That narrative information is retained for lengthier periods than factual information in long-term memory.

Fact via Narratives



Discussion and Conclusion:

The results of this study as a whole suggest that:

- There is a relationship between how central to the development of the story the scientific information is, to how memorable it becomes. In other words, as the scientific information is closer to the important moments of the narration, higher in hierarchical respect to the plot, it is more likely to succeed in communicating and making such knowledge memorable.

Fact via Narratives



Discussion and Conclusion:

The results of this study as a whole suggest that:

- People remember and retell information quoting verbatim literary phrases, analogies, metaphors and irony. These verbatim quotations suggest that people retain information when this is presented in an attractive way to them. Apparently the literary effects mentioned above enable to evoke emotions in the reader and therefore information linked to this emotional response results more memorable.

Fact via Narratives



Discussion and Conclusion:

Science through short stories... for whom?



Fact via Narratives



Discussion and Conclusion:

Science through fictional narratives for whom?

- Children
- Special Education (dyslexia)
- Teaching all education levels
- Communicating science to the general public

Fact via Narratives



Discussion and Conclusion:

What fictional literature can do for science communication:

- Generate stories as models to explain science (Lotman)
- Help people to understand and remember scientific information for lengthier periods of time compared with traditional non-narrative texts.
- To present science as it is developed including the emotions, errors and risks involved.
- To provide the public with an interface to learn science in an accurate, trustworthy, enjoyable and in a dialogical way.



We are:
the friends we have met,
the books we have read
and
an infinite number of
subtractions...

Sergio Pitol



Science Communication

Transmit : (Dornan 1990)

- information (+)
- maximum fidelity

Questions: (Durant et al 1989)

- which scientific information
- how should it be communicated

Fact via Narratives



Discussion and Conclusion:

Retelling analogies, literary phrases + irony

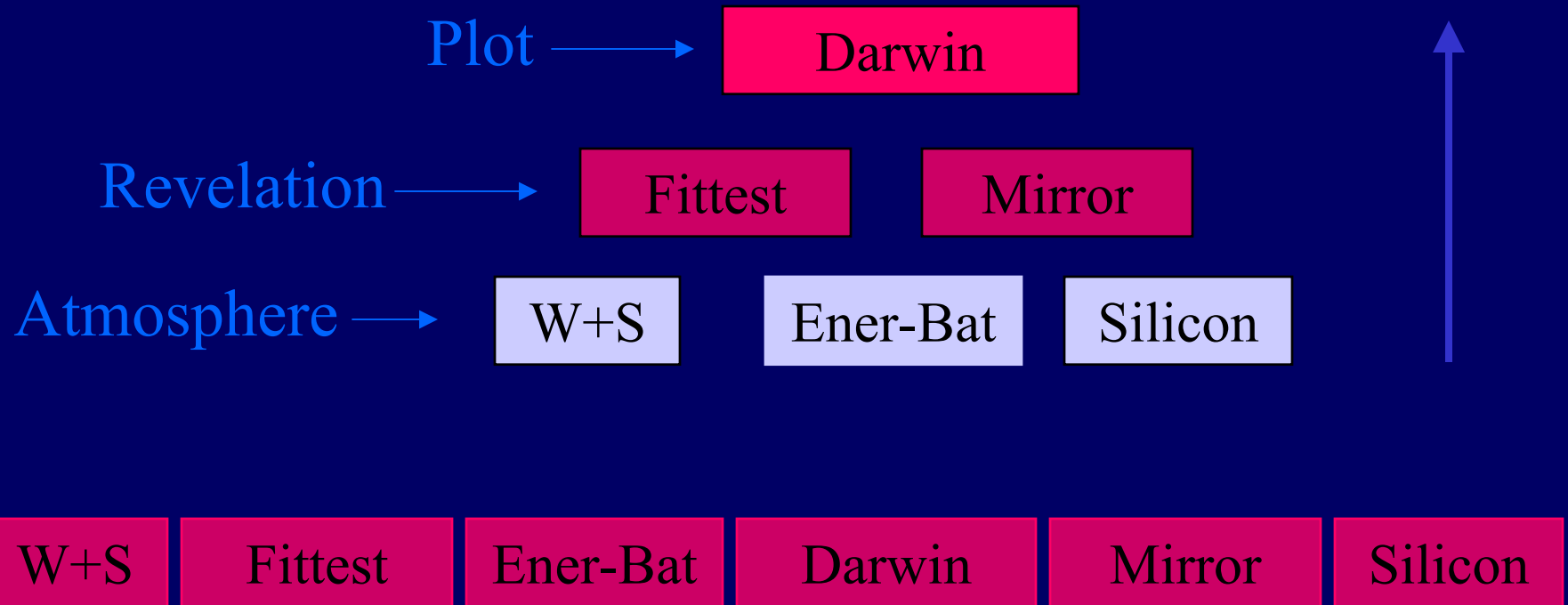
- “He only ended smelly, dirty, with a nasty brown liquid but not Alloxan.” (organic chemistry)
- “Mater as mater, neither noble or vile” (Nitrogen)
- “Put animal excretion on their lips” (the use of Alloxan)
- “What happened then was too terrible to be told” (the outcome of the experiment)

Fact via Narratives



Discussion and Conclusion:

Pyramid Model



Facts to remember from Crabs story

Fact via Narratives



Study:

Dispersion of the data:

Story 1

Story 2

