





LinkedIn as the new classroom

Storytelling and AI for nuclear communication

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A note about the content of this presentation

- I am using the PowerPoint template of my employer, as this reflects my professional affiliation.
- However, this presentation is based on my own personal project, developed outside working hours.
- Yesterday, in the session on applications of isotopes, I gave a professional talk on why Cobalt-60 is an ideal radiation source to treat the brain with the Leksell Gamma Knife.
- In this talk, I will also talk about isotopes, radiation and nuclear technologies in relation to the brain, but from a different perspective.

Fantastic Isotopes and Where to Find Them

- I work every day with radiation and isotopes, and I often talk to very different audiences about **Cobalt-60, Iridium-192, linear accelerators, and neutrons.**
- I am also someone who really enjoys talking about **physics, radiation, and nuclear technologies**, giving trainings, talking to colleagues and customers, engaging with students in schools, discussing science on social media.

What I have encountered is how **abstract** all this talk about “*nuclear,*” “*radiation,*” and “*radioisotopes*” sounds to people who are not in our field.

Almost as if I were talking about **fantastic beasts in a Harry Potter movie.**



Cobalt 60 in my pocket

I always try to make science relatable.

I asked to one of our suppliers to manufacture a pocket size jar with the exact amount of Cobalt pellets that is loaded in one Gamma Knife (20 grams)

And I started pulling it out of my pocket when talking about Cobalt 60.

Now I could talk about it, and show something relatable.

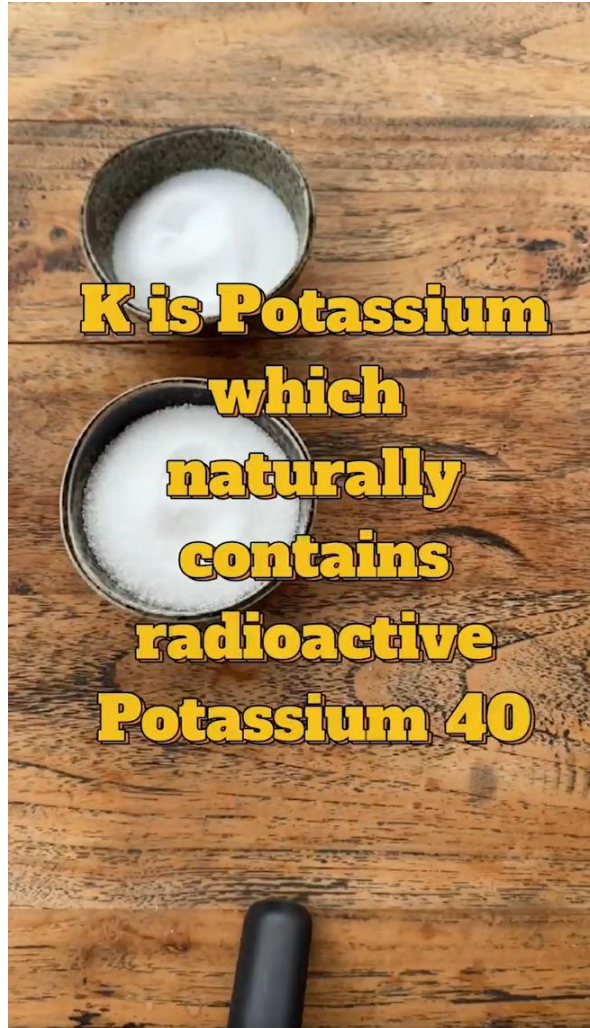


have inside the gamma knife.



Rad Chat Podcast, hosted by Jo McNamara and Naman Julka-Anderson

Then, one day I posted on LinkedIn a video of me eating some radioactive salt...





Radioactive Ingredients

- Bananas (^{40}K)
- Brazil Nuts
- Low-Sodium Salt (KCl) (^{40}K)
- High-Potassium Milk (^{40}K)
(Banana milk or potassium-fortified milk)
- Monsooned Coffee (^{60}Co Irradiated)
- Eggs (^{40}K)
- Dark Chocolate
(Trace U/Th)
- Butter, Flour, Sugar, Baking Powder
- Non-Stick Cake Form
(Radiation Hardened)



Can LinkedIn be the new classroom?

The video about table salt and Potassium 40 went viral, 200.000 impressions, on a platform like **LinkedIn**, which was traditionally dedicated to professional topics, career development, business...

But science communication?

Yet, this is a very relevant platform as this is the social network where highly educated professionals, managers, industry leaders, decision makers are present (not on Facebook, Instagram, TikTok)

But why this post presenting a nuclear physics topic, introducing the concept of isotopes and radiation, was successful?

LinkedIn Demographics

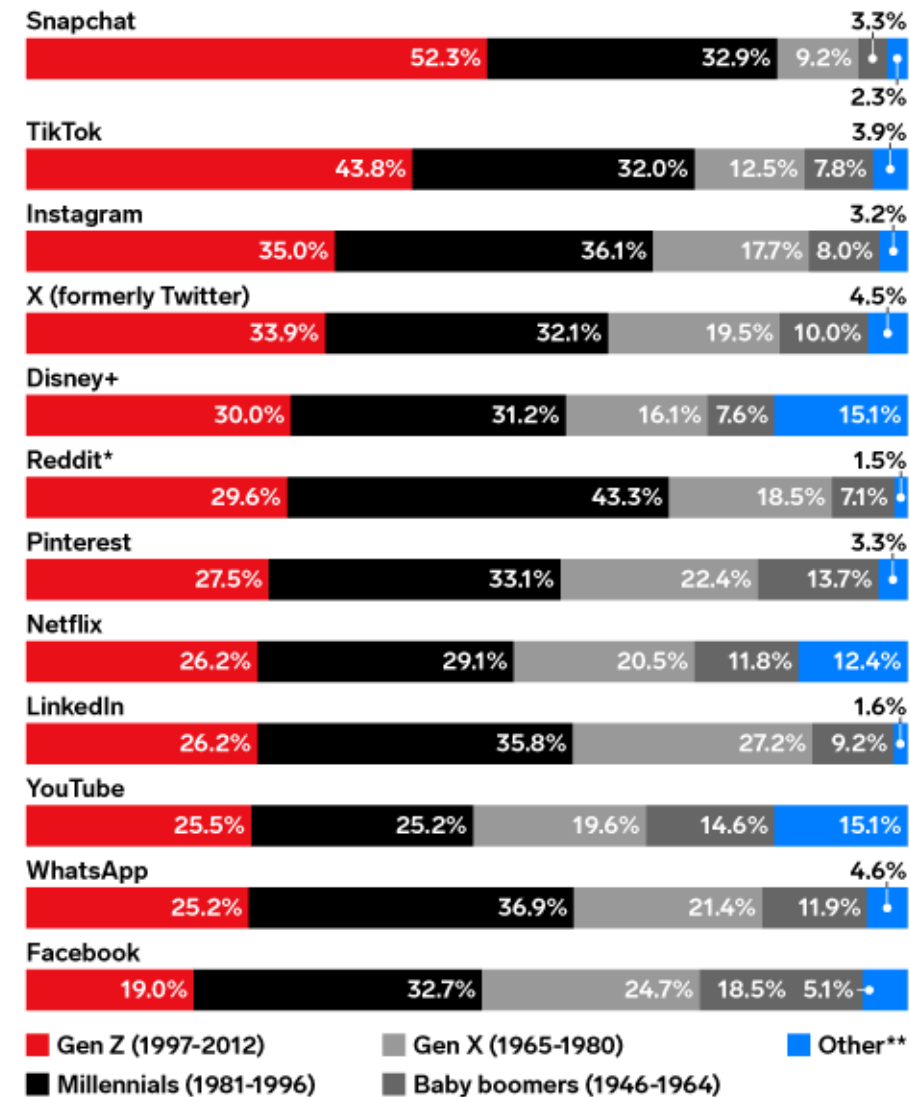
- 53% of U.S. adults who earn more than \$100,000 per year use LinkedIn
- 54% of U.S. college graduates use LinkedIn
- There are 10 million C-level executives on LinkedIn. In addition, there are 180 million senior-level influencers and 63 million decision makers.
- Executives from every Fortune 500 company are on LinkedIn
- LinkedIn members earn 15% more than users of other social platforms

Data sources: LinkedIn and Michelle Martin (2025) for hootsuite.com



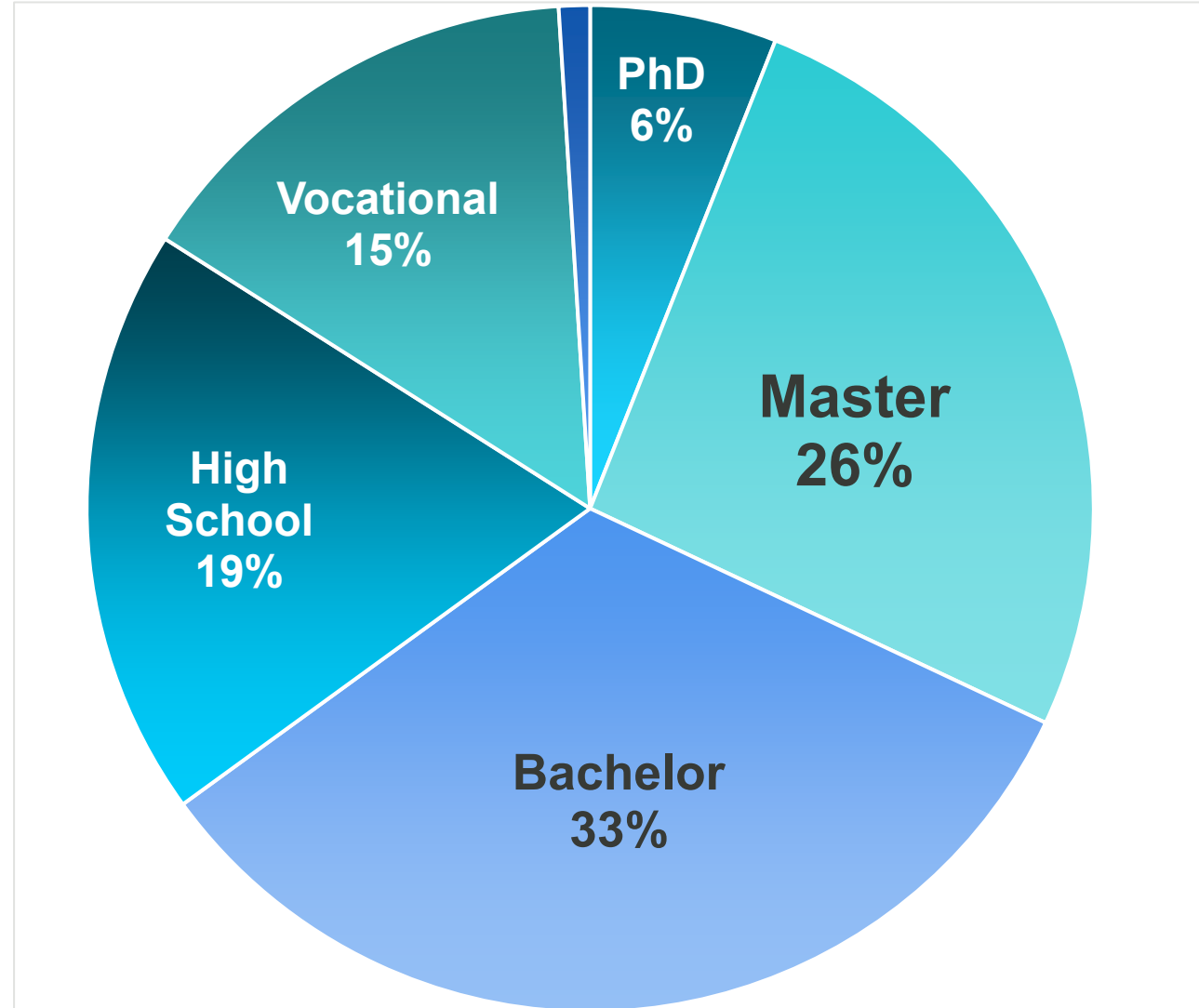
Share of Total US Users on Select Digital Platforms, by Generation, 2024

% of total



Note: internet users who access their account on the referenced digital platform via any device at least once per month; social network user forecasts from May 2023; *logged-in users; **includes the Silent Generation, Gen Alpha, and younger
Source: EMARKETER Forecast, May 2024

LinkedIn Demographics



Can I teach about isotopes on LinkedIn?

- ❑ I asked myself, can I “teach” about isotopes, radiation and nuclear physics on LinkedIn?
- ❑ And what is the best way to do that?

We need to look at the cognitive model, memory and how this works on social media.

The cognitive model

- To understand learning, we must understand **memory**.
- When we say, “I learned something,” we may confuse *momentary performance* with *lasting change*.
- **Working memory** is fast but capacity-limited.
 - It handles only a small number of elements, is easily disrupted, and fades within seconds.
 - Immediate understanding does not necessarily lead to lasting learning.
 - Baddeley (1992) defines working memory as a system for “temporary storage and manipulation” needed for learning and reasoning
- **Long-term memory** has a very large, often described as virtually unlimited, capacity and can retain information for years or decades (Squire & Kandel, 1999).

Social media and the dominance of working memory

- Content on social media is fast and often interesting, but it mainly engages our **working memory**.
- Social media biases us toward working-memory processing. At the same time, the continuous flow of inputs and frequent switching of attention can reduce the resources available in working memory.
- ❑ **“To scroll or not to scroll: Scrolling, working memory capacity, and comprehending complex texts”** shows that scrolling formats can reduce understanding of complex topics, especially when working-memory capacity is limited (Sanchez & Wiley, 2009).
- ❑ **“Media multitasking and memory: Differences in working memory and long-term memory”** shows that media multitasking is associated with differences in both working-memory and long-term memory performance (Uncapher et al., 2016).



A social-media driven “Eureka!” moment. What will remain in my long-term memory, tough?

A meta-talk moment

Did you notice?

A meta-talk moment

In the previous slide, I played the same game I just called out.

A meta-talk moment

- A presentation, by definition, activates working memory. You listen, you read, you follow...
- A colorful image, dense text, bold statements, paper titles...
- All of this competes for the same limited working memory resources.

A meta-talk moment

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A social-media driven "Eureka!" moment. What will remain in my long-term memory, tough?

A meta-talk moment

The information may feel interesting, reasonable, understandable, even convincing, but how can we facilitate the consolidation into long-term memory?

We need to activate other channels.

- **Meta-talk** is one strategy:
take a step back, change perspective, break the fourth wall, and prompt the learner to reflect on *how* they are learning.
- **Repetition** is another strategy:
revisiting ideas over time and across contexts to strengthen connections and improve recall.

The power of repetition

- Repetition plays an important role in learning. Seeing the same idea multiple times increases the chance that it is noticed, remembered, and recognized.
- Research on learning shows that **repeated exposure over time improves memory retention**, especially when repetitions are spaced rather than concentrated in one moment (*Cepeda et al., 2006*).
- Repetition helps us establish patterns in the brain. Information feels familiar, easier to process, and less effortful.
- This mechanism is extremely effective in **advertising**. We recognize a logo, a slogan, a brand. And familiarity builds trust and preference.

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A social-media driven "Eureka!" moment. What will remain in my long-term memory, though?

Elekta

The power of repetition

- But do we really understand a product just because it feels familiar?
- Familiarity helps us recognize something. It does not necessarily help us explain it, reason about it, or use it correctly.
- In **advertising and consumer psychology**, repeated exposure alone is known to increase liking and preference, even without deeper knowledge of the product (*the “mere exposure effect”*; Zajonc, 1968).
- In learning, repetition alone often creates the **feeling of understanding**, without guaranteeing deep or durable knowledge.



Storing information is not the same as learning



Long-term memory: productive and context dependent

- In his book *Teaching Physics with the Physics Suit*, Edward Redish describes recall from long-term memory as productive and context dependent (Redish, 2003).
- **Productive means that recall is active.**
Information is brought up from long-term memory and used in new ways:
 - to explain
 - to reason
 - to solve a problem
 - to make a decision
- **Context dependent** means that recall depends on:
 - the external situation
 - how the information is presented
 - the state of mind of the person

Learning happens when we retrieve and process that knowledge.



BLOOM'S TAXONOMY



helpfulprofessor.com

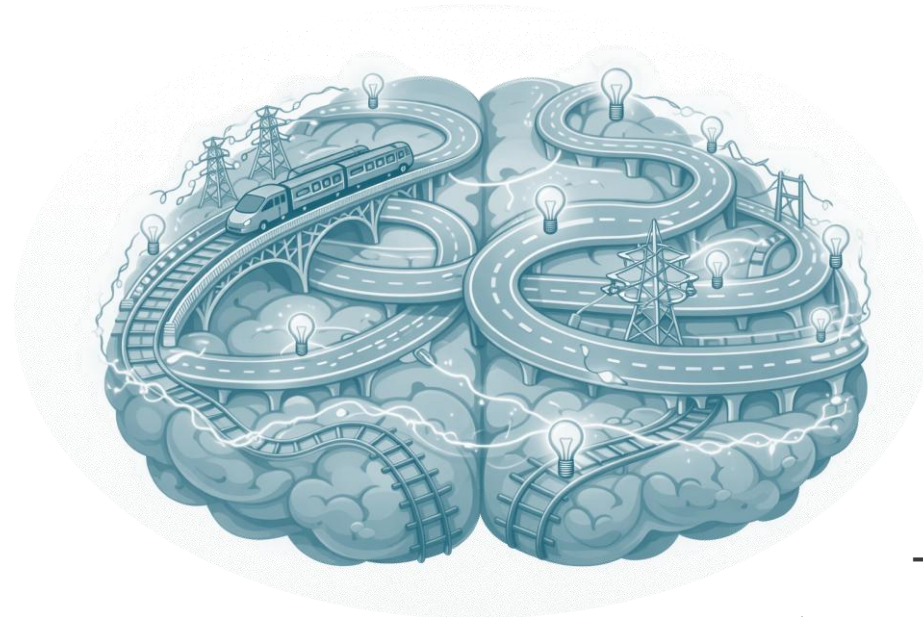
Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). Taxonomy of educational objectives: The classification of educational goals. Introduces a hierarchical model of learning, from basic recall to higher-order thinking. Infographic by HelpfulProfessor.Com

How learning happens

Meaningful learning depends on connecting new information to **what the learner already knows**
(Ausubel, 1968)

Recall depends on retrieval cues;
multiple cues improve access to memory
(Tulving & Thomson, 1973)

Memory is reconstructed using existing schemas, not retrieved as exact copies
(Bartlett, 1932)



Hebbian learning: repeated co-activation strengthens neural connections (Hebb, 1949)

Understanding relies on **structured knowledge patterns** that guide interpretation
(Rumelhart, 1980)

The molecular biology of memory storage: long-term memory is supported by lasting **changes in synaptic strength**
(Kandel, 2001)

From theory back to LinkedIn


If learning depends on:

- context
- existing patterns
- emotional and real-life anchors

Then effective science communication should:

- start from the **familiar**
- create a **story**
- and let the science attach to it

Iodine-131 in Nuclear Medicine: Key Facts

Iodine-131 (I-131) is a radioactive isotope of iodine with a physical half-life of 8.02 days . It decays by beta minus (β^-) emission and also emits gamma photons (364 keV), which makes it suitable for both therapeutic and diagnostic applications.

Production

I-131 is produced in nuclear reactors via neutron irradiation of tellurium targets, followed by chemical separation and purification.

Clinical Applications

I-131 is widely used in nuclear medicine for:

- Treatment of hyperthyroidism (Graves' disease, toxic multinodular goiter)
- Thyroid cancer ablation
- Management of metastatic thyroid carcinoma

Typical administered activities range from 200–800 MBq for benign thyroid disease, with higher activities used in oncological indications.

Mechanism of Action

Due to active uptake in thyroid tissue via the sodium-iodide symporter, I-131 delivers localized beta radiation, resulting in cytotoxic effects. The emitted gamma photons allow post-therapy imaging and dosimetric evaluation.

Radiation Protection

Appropriate patient instructions, isolation precautions, and dose monitoring are required to ensure compliance with regulatory limits and public safety standards.

Iodine-131 remains a cornerstone of nuclear medicine thanks to its favorable physical and biological characteristics.

#NuclearMedicine #Isotopes #RadiationTherapy


#HealthcareInnovation #MedicalPhysics

Iodine-131 in Nuclear Medicine

About Iodine-131

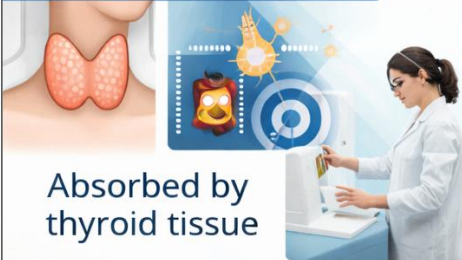
- Radioactive isotope with an 8.02 day half-life
- Emits both β^- particles and γ -rays
- Produced in nuclear reactors
- **Thyroid cancer management**

Clinical Applications



- Treatment of hyperthyroidism
- Thyroid cancer management
- Thyroid cancer ablation
- Management of metastatic thyroid carcinoma


How It Works




Absorbed by thyroid tissue

- Localized β^- radiation
- Simultaneously γ -rays

Radiation Safety



- Patient isolation
- Robust regulation
- Leakage monitoring
- #1 Safety

#1 Safety 

The Orlando Case

The story

- In January 2005, an ordinary passenger at Orlando airport triggers a radiation alarm.
- He is detained and treated as a terrorist.
- The cause is not nuclear weapon, but a recent nuclear medicine treatment (Iodine-131).

What this story gives us an opportunity to talk about

- Nuclear medicine
- The use of isotopes
- Safety of these applications
- The fact that they are part of everyday life, even if we do not notice them



Why it works

- It starts from a familiar context (airport security).
- It uses emotion and surprise to capture attention.
- It connects new concepts to personal experience.
- The science is intertwined with the story.

The Cat in the Scanner

The story

- A passenger's cat is sent through an airport X-ray scanner. This really happened to a colleague of mine.
- Panic, confusion, and a very stressed cat follow.
- It sounds absurd, but it is not an isolated case.

What this story gives us an opportunity to talk about

- Airport X-ray and CT scanners
- Radiation dose (μSv vs mSv)
- Medical imaging vs security scanning
- The idea that radiation exposure is context-dependent



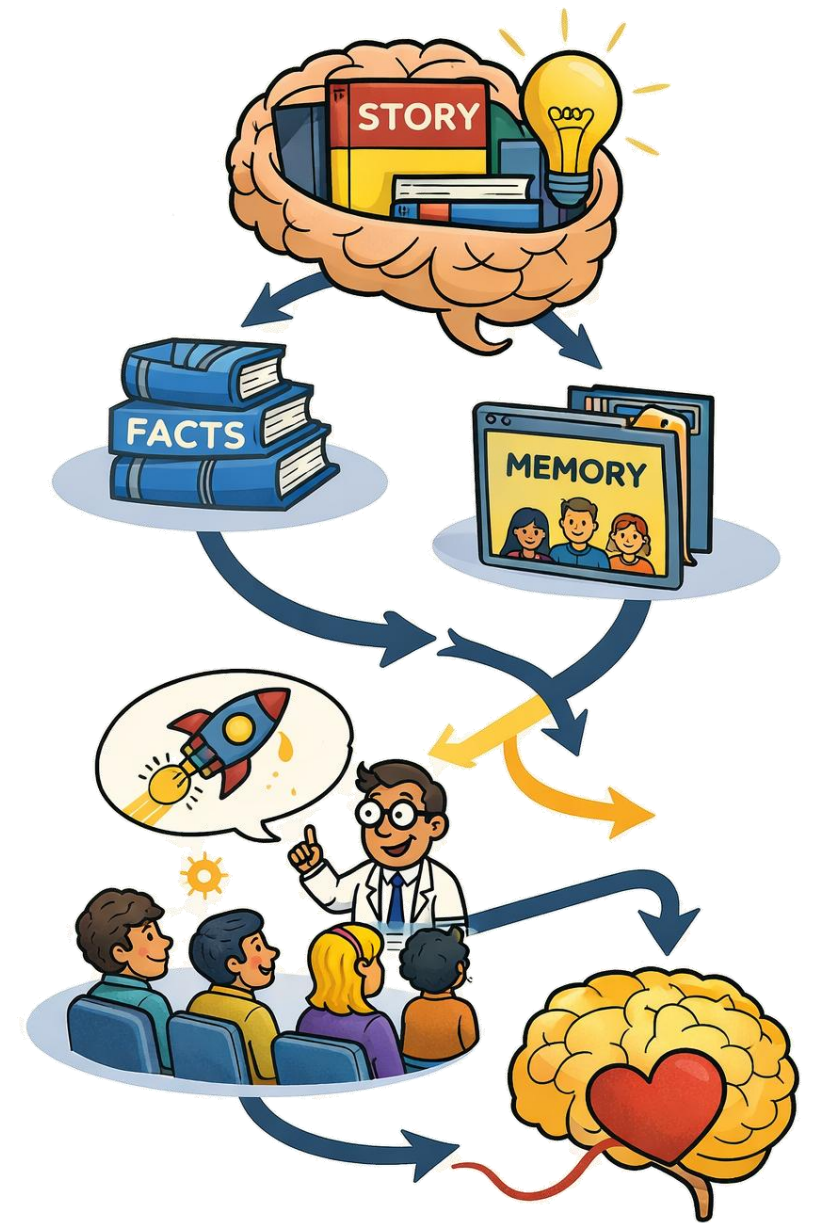
Why it works

- It starts from a strong emotional trigger
- It uses a surprising, almost humorous situation.
- It connects radiation to daily experience
- It allows quantitative comparisons (dental X-ray, CT scan, cosmic rays).
- The science comes along with the story, expanding on what we already know.

In conclusion: why storytelling in science communication on LinkedIn ?

- Humans organize meaning through narrative, not just logic. **“Narrative is a mode of thought that provides a means for organizing experience.”** (Bruner, 1991)
- Memory is indexed by stories and experiences, not abstract facts (Knowledge and memory: the real story, Schank & Abelson, 1995)

Mayer’s multimedia learning theory shows that learning improves when information **is embedded in meaningful structures** rather than presented as isolated facts (Mayer, 2009)



People learn more deeply when ideas are expressed in words and pictures rather than in words alone. (Mayer, 2009)

“Understanding means mapping your stories onto my stories.”

Schank, R. C., & Abelson, R. P. (1995).
Knowledge and memory: the real story.

Thank you



Hope for everyone
dealing with cancer.