

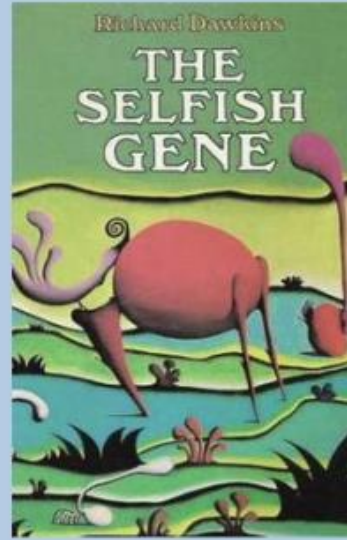
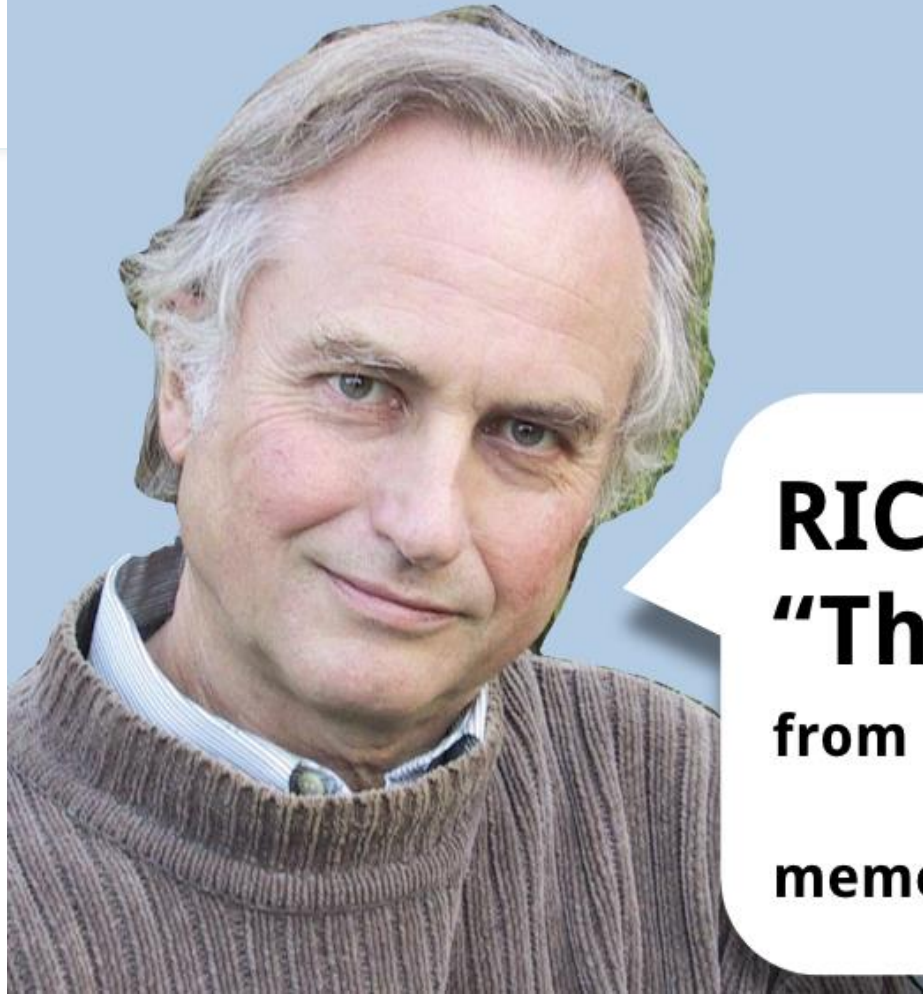


From Meme to Virtual Reality

Lecture 19 - 5th December 2024

Technology in Mathematics Education

WHAT ARE MEMES?



1976

RICHARD DAWKINS **"The Selfish Gene"**

from Greek μίμημα 'that which is imitated'

meme : human culture = gene : biological heritage

WHAT ARE INTERNET MEMES?

1993

MEMES

Fashions

Ideas

Art

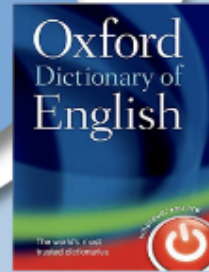
Tunes

INTERNET MEMES

*Captioned images
(Image Macros)*

Videos

Texts



➔ A digital artefact, typically **humorous in nature**, that is copied and **spread rapidly** by Internet users, often with **slight variations**

Oxford Dictionary of English, **2019**

EXAMPLES OF DIVERSE INTERNET MEMES GENRES

Performances:
the bottle cap challenge



Photo Fads:
the leaning tower of Pisa forced perspective



Image macros:
the Success Kid



THE EVOLUTION OF IMAGE MACROS



from LOLcats



tics



...and mathematics

OUR FOCUS: MATHS IMAGE MACROS

[source Facebook]

WHEN YOUR LONG DIVISION



ENDS UP WITH NO REMAINDER

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Arithmetics



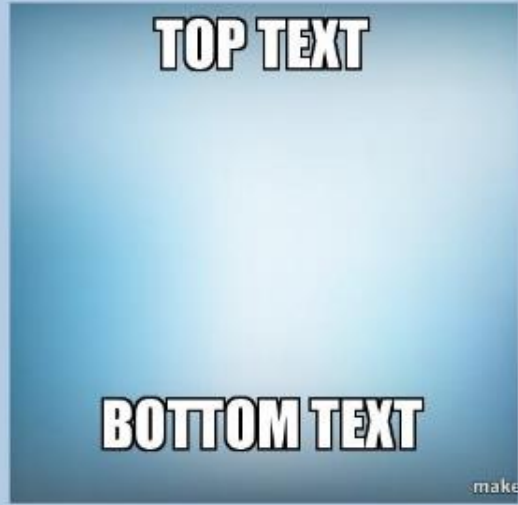
Trigonometry

Me using $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ to find roots of $x^2 - 1 = 0$.



Algebra

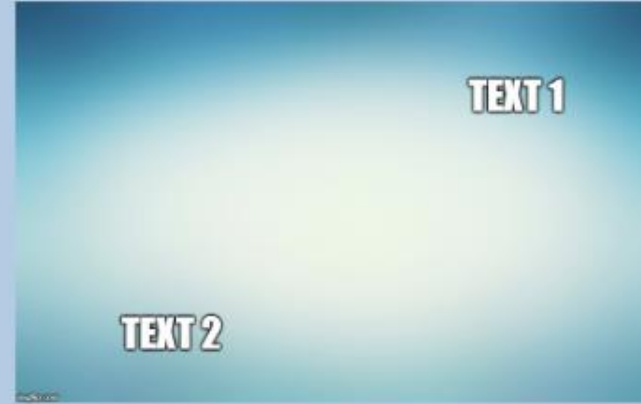
THE **TRIPLE-S** CONSTRUCT OF THE PARTIAL MEANINGS OF INTERNET MEMES (BINI & RO BUTTI, 2019)



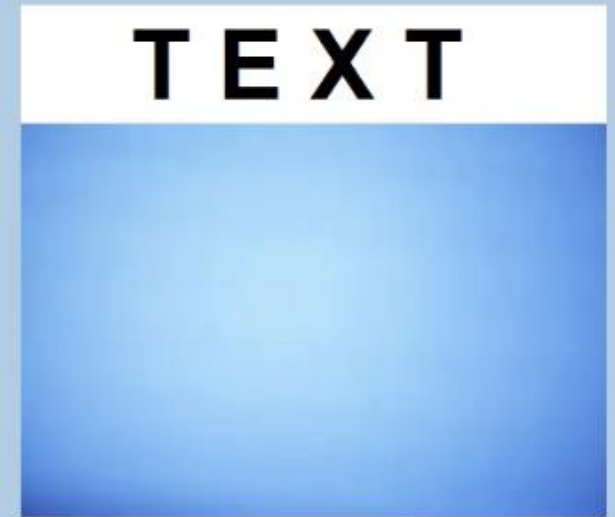
SINGLE-PANE



MULTI-PANE



OBJECT-LABELING



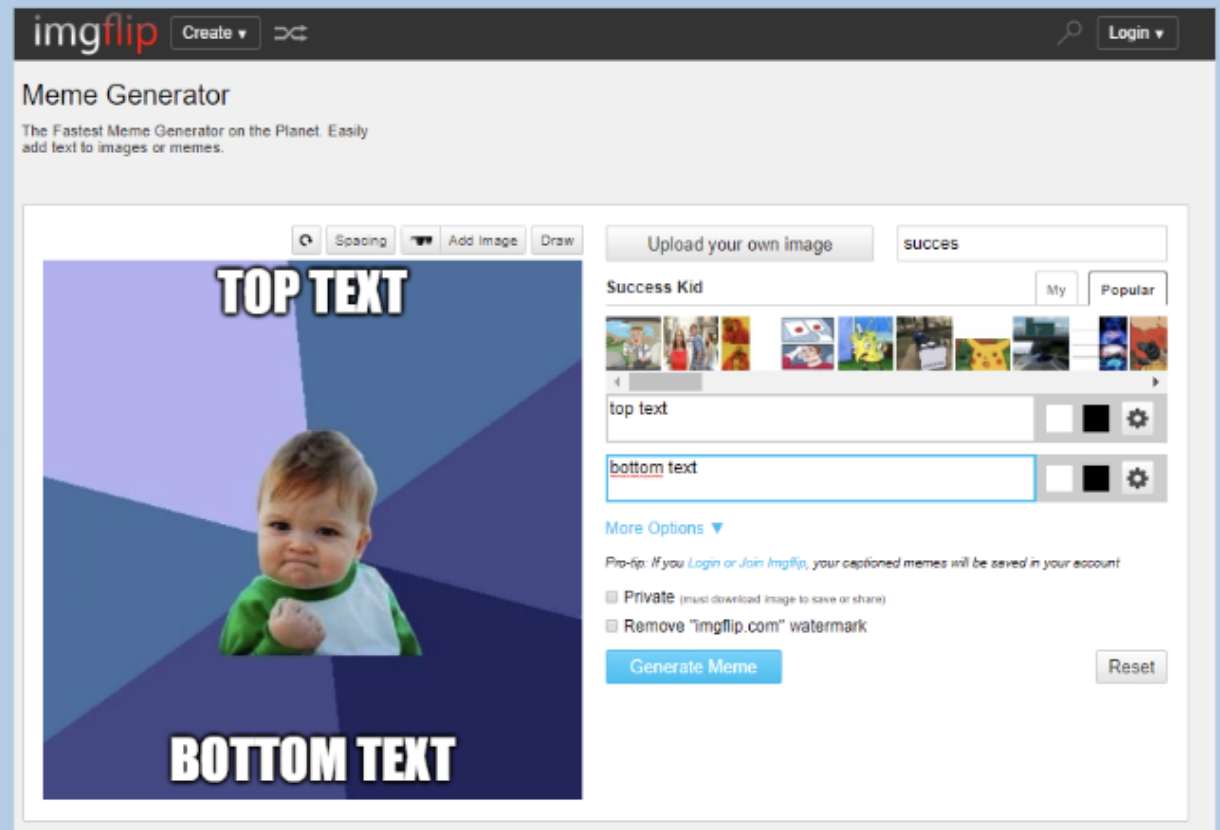
WHITE BORDER

The **first partial meaning** is **STRUCTURAL** and lies in having a recognizable and consistent aesthetic, given by the text font, colour and position, and by the image visual impact.

MOBILE DEVICES' SCROLLING GESTURE SHAPES STRUCTURAL RULES



STRUCTURAL RULES SHAPE MEME GENERATOR WEBSITES



THE **TRIPLE-S** CONSTRUCT OF THE PARTIAL MEANINGS OF INTERNET MEMES (BINI & ROBUTTI, 2019)



The **second partial meaning** is ***SOCIAL*** and lies in the shared conventions of viral images, compositional setups and syntaxes.

THE *MEMESPHERE* SHAPES SOCIAL RULES LIKE TEMPLATES NAME & USE

Featured Memes

- Success Kid (circled in red)
- Third World Success Kid
- Success Kid Original

User Templates

- Happy Picard
- dj khaled suffering from success meme
- Tony Stark success

Each meme entry includes an image and an "Add Caption" button.

SOCIAL RULES SHAPE WEBSITES LIKE KNOW YOUR MEME

Know Your Meme

Search: success kid (circled in red)

Success Kid / I Hate Sandcastles

Part of a series on Babies. (View Related Entries)

Updated 9 months ago by Y F.

Added 9 years ago by Greg McCoral

Share 328 | Salva | Tweet | Like us on Facebook | Like 1.1M

PROTIP: Press 'T' to view the image gallery, 'V' to view the video gallery, or 'R' to view a random entry.

Meme

Status: Confirmed

Type: Image Macro

Year: 2007

Origin: Flickr

Tags: kiki, explicable, baby, success kid, success, adult, animal, sandcastles, rolf, victory baby

Additional References: Encyclopedia Dramatica, Meme Generator

About

THE **TRIPLE-S** CONSTRUCT OF THE PARTIAL MEANINGS OF INTERNET MEMES (BINI & ROBUTTI, 2019)



general humor



maths



Politics

[Obama's staff on Twitter, June 2013]

The **third partial meaning** is **SPECIALIZED** and lies in images, symbols or text referring to a specific topic.

The Success Kid

Structural Meaning



Social Meaning

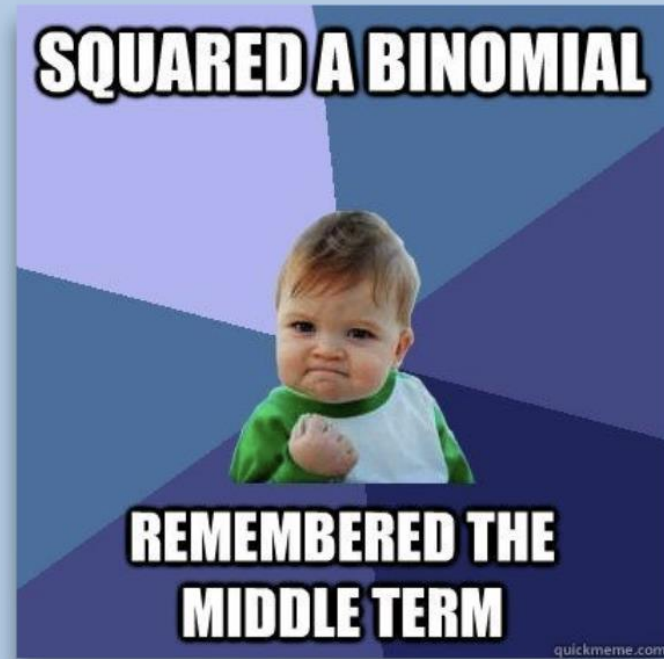


Didactic use: emphasize correct practices related to positive emotions

EXAMPLES



EXAMPLES

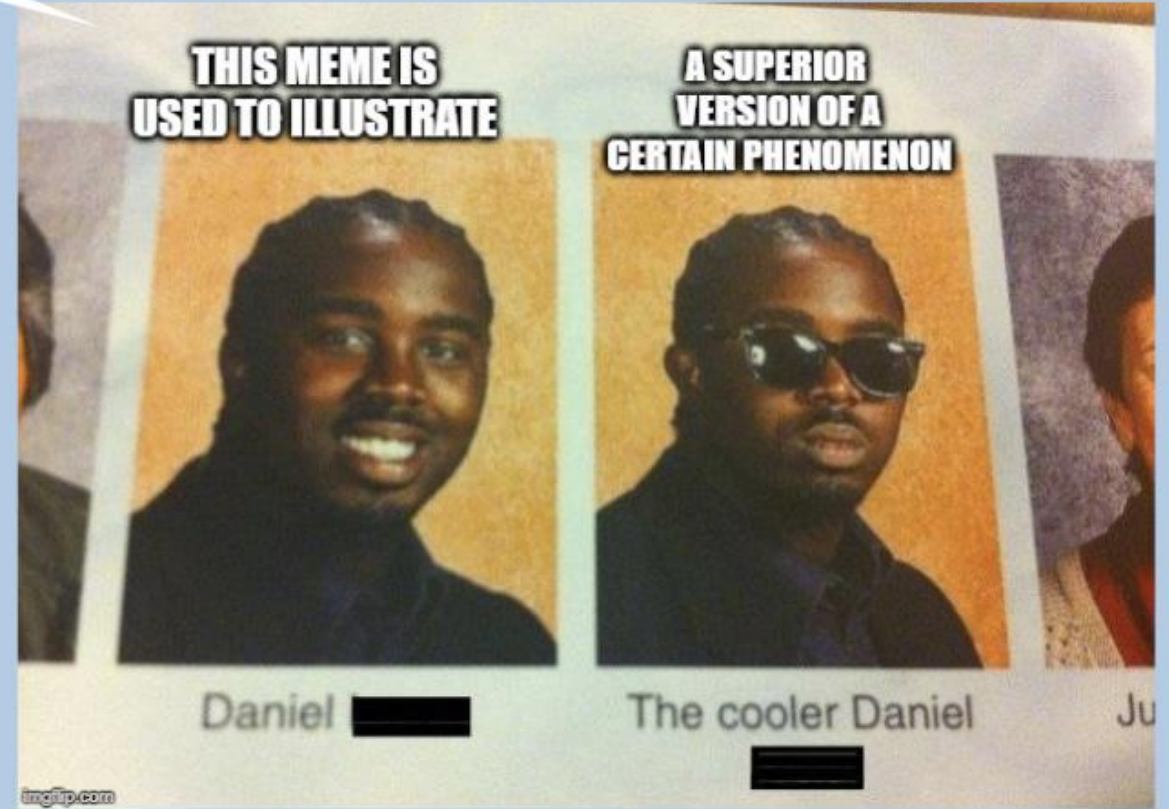


The cooler Daniel

Structural Meaning

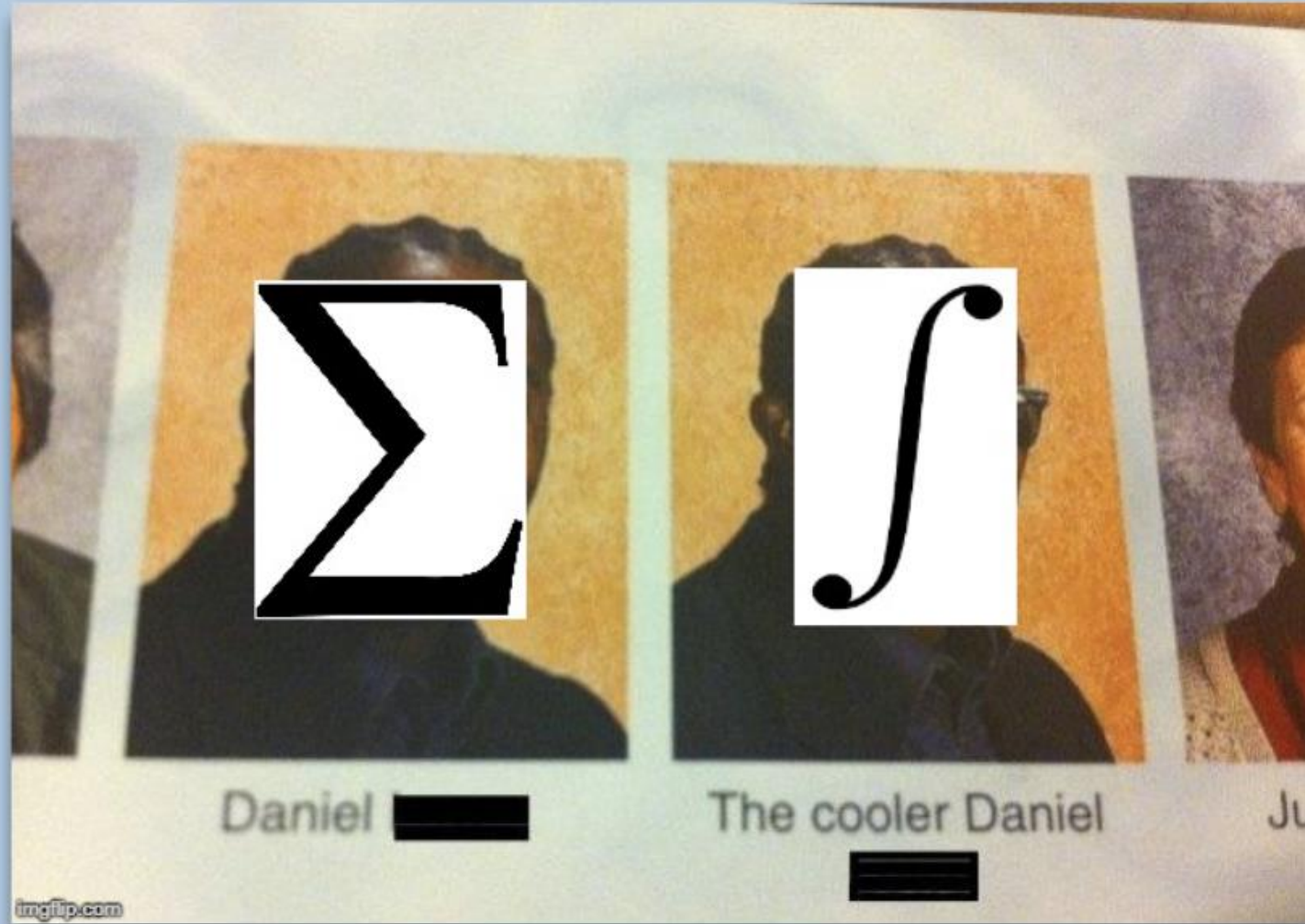


Social Meaning



Didactic use: compare different levels of mathematical concepts

EXAMPLES



Distracted boyfriend

Structural Meaning



Social Meaning



Didactic use: draw attention to misconceptions and classic errors

EXAMPLES



EXAMPLES

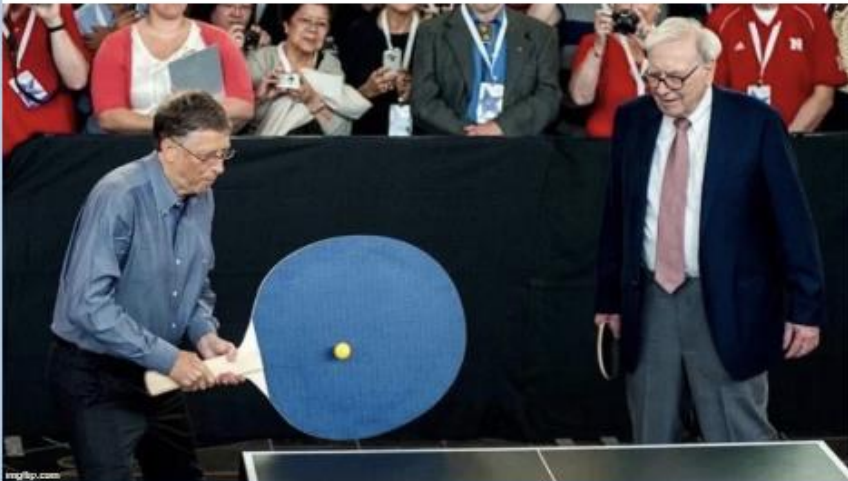


Bill Gates' giant ping pong paddle

Social Meaning

Structural Meaning

This meme is used to make fun at a tool that is too powerful for a particular job



Didactic use: focus on optimized procedures

EXAMPLES

Using a calculator to make sure $4+3$ equals 7 on a test



EXAMPLES

Me using $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ to find roots of $x^2 - 1 = 0$.



OTHER EXAMPLES

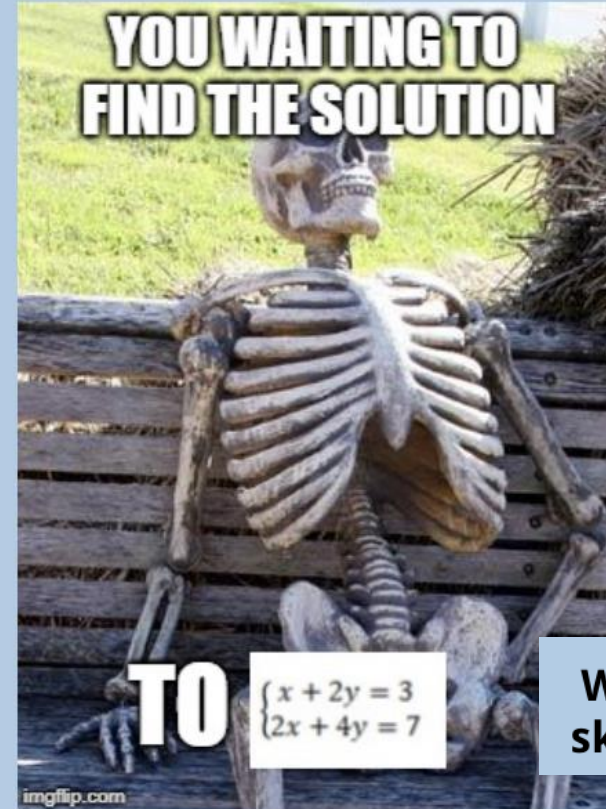
$$\int e^x x^2 dx$$



Me Opening up
to Someone

OTHER EXAMPLES

YOU WAITING TO
FIND THE SOLUTION



Waiting
skeleton

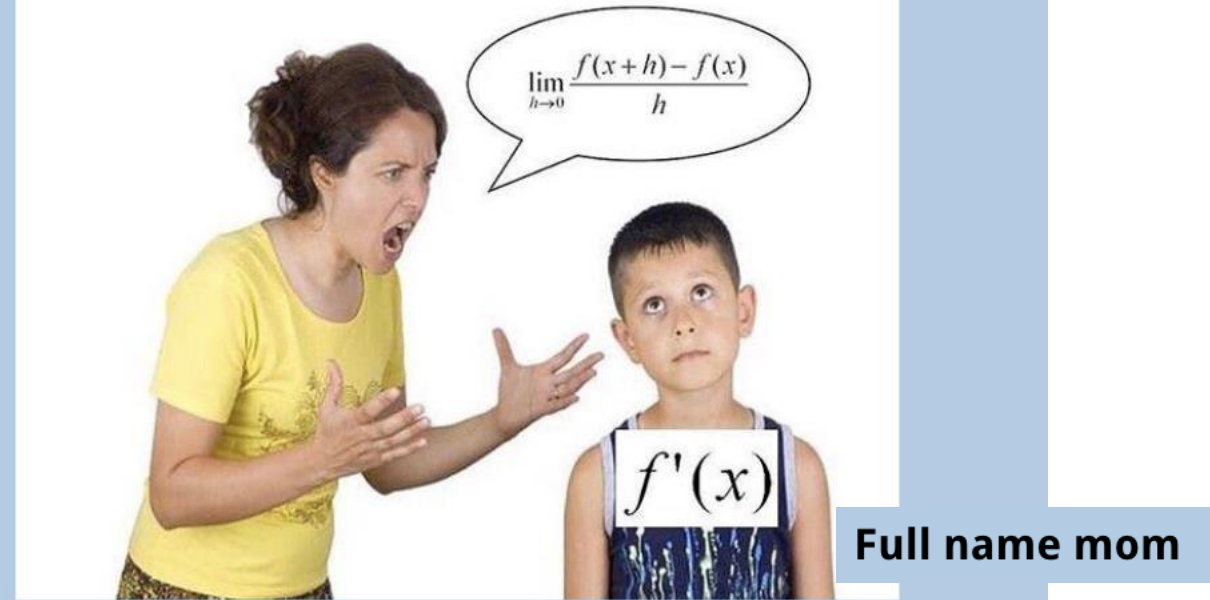
OTHER EXAMPLES



Classroom suggestion

OTHER EXAMPLES

When your mom calls you by your full name:



OTHER EXAMPLES



iPhone x



iPhone $y = x$



iPhone $y = x^2$



iPhone $y = x^3$



iPhone x



iPhone y



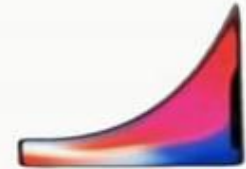
iPhone $y = x$



iPhone $y = x^2$



iPhone $y = x^3$



iPhone $y = e^x$



iPhone $y = \sin x$



iPhone-
 $(x-h)^2 + (y-k)^2 = r^2$



iPhone-
 $x^4 - y^4 = xy$

Possible activities for students

1. SEARCH
2. CREATION
3. DISCUSSION

ANALYSIS OF
PARTIAL
MEANINGS

DEEPENING OF THE
SPECIALIZED
MEANING

POSSIBLE
DIDACTIC USES

1. **Web search** for a meme on an assigned or free topic

Packing of partial meanings

Deepening of the mathematical meaning through video, written text, GeoGebra applet

- Systematization of knowledge
- Formative evaluation
- Metacognition
- Motivation
- Engagement


Creation of a meme on an assigned or free topic

Unpacking of partial meanings

3. **Class discussion** on memes found or created by classmates or teacher

Packing and unpacking of partial meanings

Collective discussion of the mathematical meaning



Meme as tools to systematize the knowledge already acquired by the class on a given topic, with particular attention to the following aspects:

COGNITIVE

- **strengthening of the mathematical discourse** and of the topic vocabulary
- **improvement of the ability to relate different representations** of a concept

NON-COGNITIVE

- **widening of the spectrum of student involvement** by leveraging on non-strictly educational skills;
- **openness to humour, creativity and emotions** in a subject traditionally distant from these elements;
- **updating of the teacher-student relationship**, thanks to the two-way exchange triggered by memes (the teacher learns about an artefact representative of youth culture while students learn maths);
- **engaging and motivating students**, using memes to connect with them in a different way.

BEFORE THE ACTIVITY: FOR THE TEACHER

Identify a topic already developed in class for which reorganization and systematization can be useful: the understanding and therefore the creation of a meme requires, in fact, to be able to access the third level of partial meaning (the specialized one).

Set up the virtual space for sharing works: memes, although extrapolated from the social context and brought into the school environment, maintain their value as “*social currency*” within the class group, and their message is strengthened by sharing and likes.

The most convenient environment for sharing is a Padlet board, but any other sharing tool that allows reactions is fine; if digital resources are scarce, the memes themselves, printed and hung in the classroom, are an excellent solution!

To maximize peer exchange, it is preferable to have the activity performed in pairs, using on-line devices.

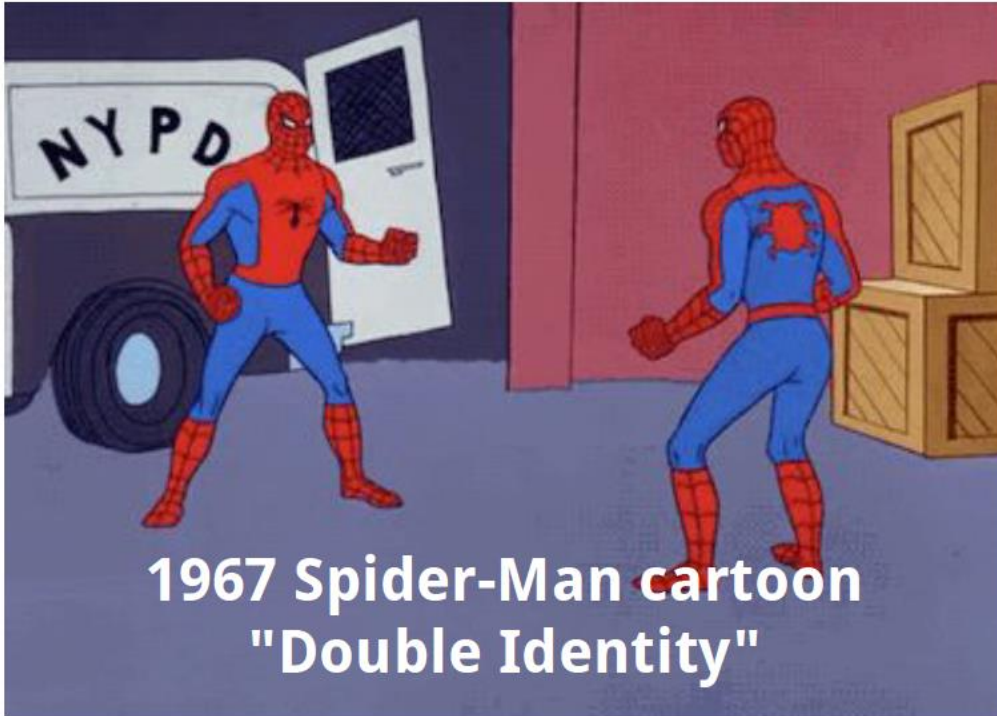
Students will create:

- a **meme (in the language you prefer) on a specific topic selected by the teacher**, created with an online device using one of the [webapps for creating memes](#) already seen on the [“Understanding and creating a meme” page](#);

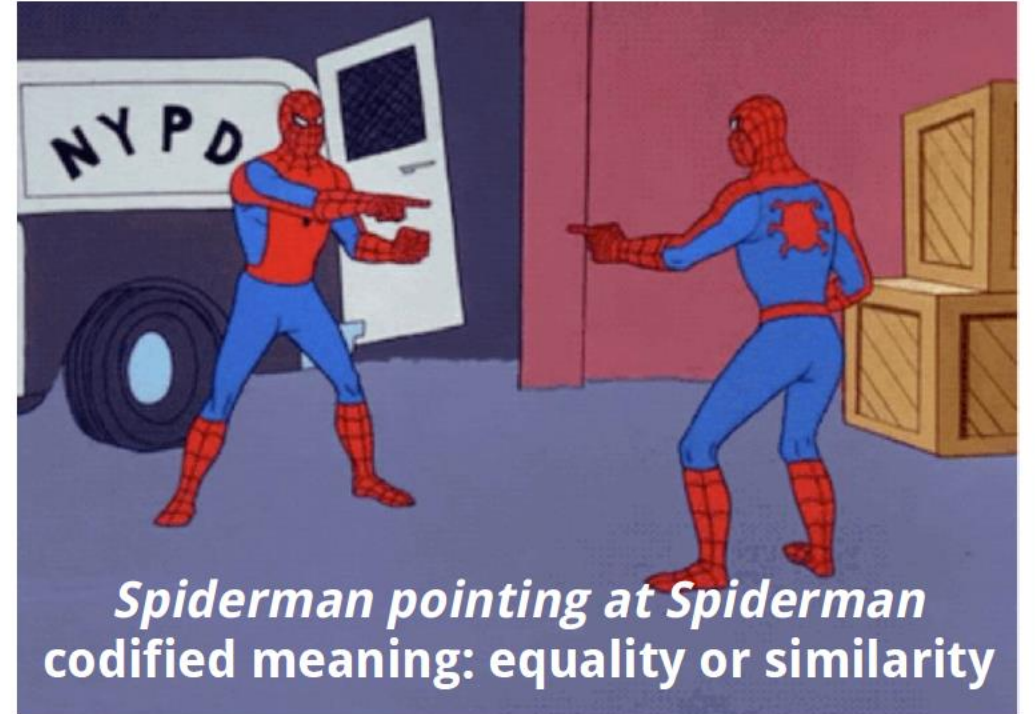
to which, at the discretion of the teacher, it will be possible to add:

- a **short video** (in your chosen language) max 2/3 minutes, a **written text or a short PowerPoint presentation explaining the mathematical content needed to understand the meme (not the joke!)**, created with a smartphone or a tablet; to facilitate sharing, the video can be uploaded to [Youtube](#) (using the “unlisted” option if you do not want it to be visible to the public);
- a **GeoGebra applet, which graphically or symbolically illustrates the mathematical content**, created with the GeoGebra sw downloaded to the device in use or through the online app.

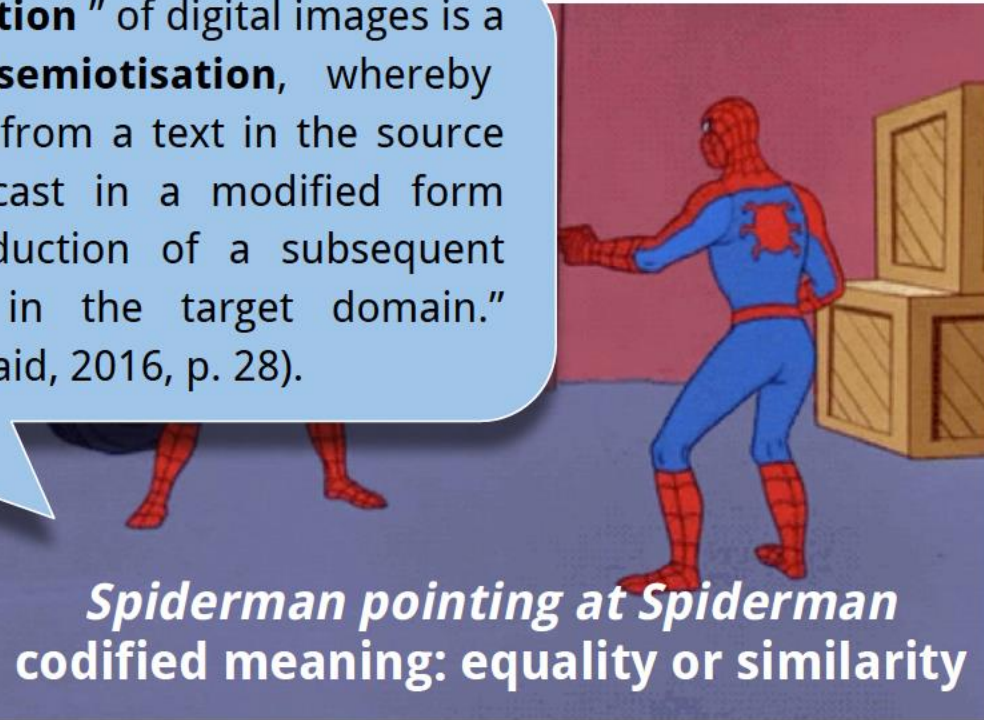
TEMPLATES



TEMPLATES



This “**memeification**” of digital images is a process of “**resemiotisation**,” whereby content is lifted from a text in the source domain and recast in a modified form during the production of a subsequent derivative text in the target domain.” (Laineste, & Voolaid, 2016, p. 28).



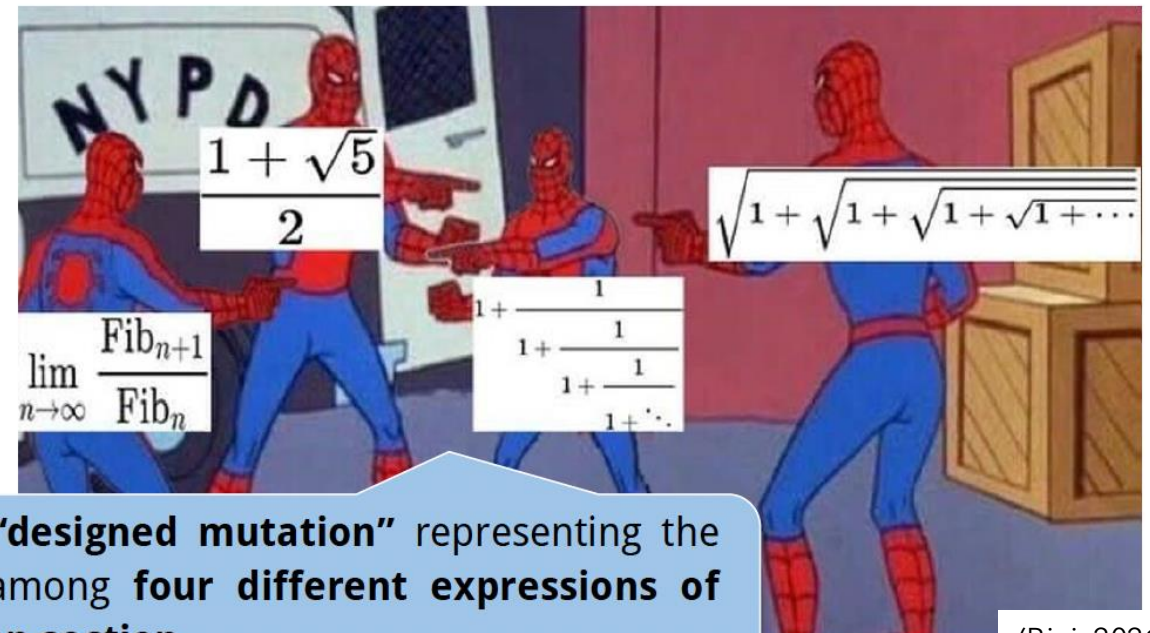
Spiderman pointing at Spiderman
codified meaning: equality or similarity

CRACKING THE PUZZLE



The *Spiderman* template is used to represent the mathematical **property of the derivative of the exponential function**

The *Spiderman* template undergoes a “**designed mutation**” to convey the mathematical idea of **small angle approximation**



Another “**designed mutation**” representing the relation among **four different expressions of the golden section**

$$x^2 + 3x + 2 = 0$$

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x^2 + sx + p = (x + x_1)(x + x_2)$$

$s = x_1 + x_2$ $p = x_1 \cdot x_2$

Daniel [REDACTED]

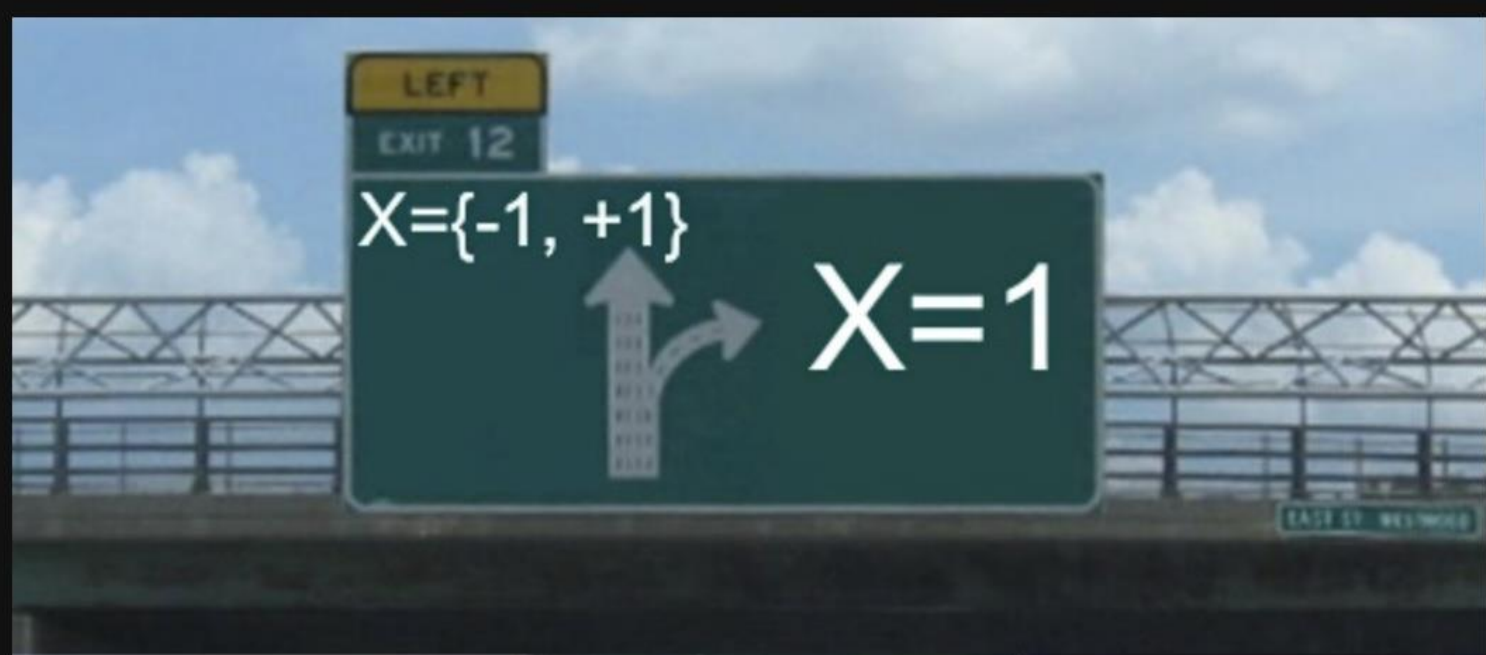
The cooler Daniel [REDACTED]



Ruffini



Qualsiasi
altro
metodo di
scomposizione



**QUANDO DEVI RISOLVERE
 $X^2+1>0$**



**E TI RICORDI CHE NON
SERVE FARE IL CALCOLO PERCHÈ HAI
UN QUADRATO + 1**

imgflip.com



imgflip.com



$$x^2 - 1 = 0$$

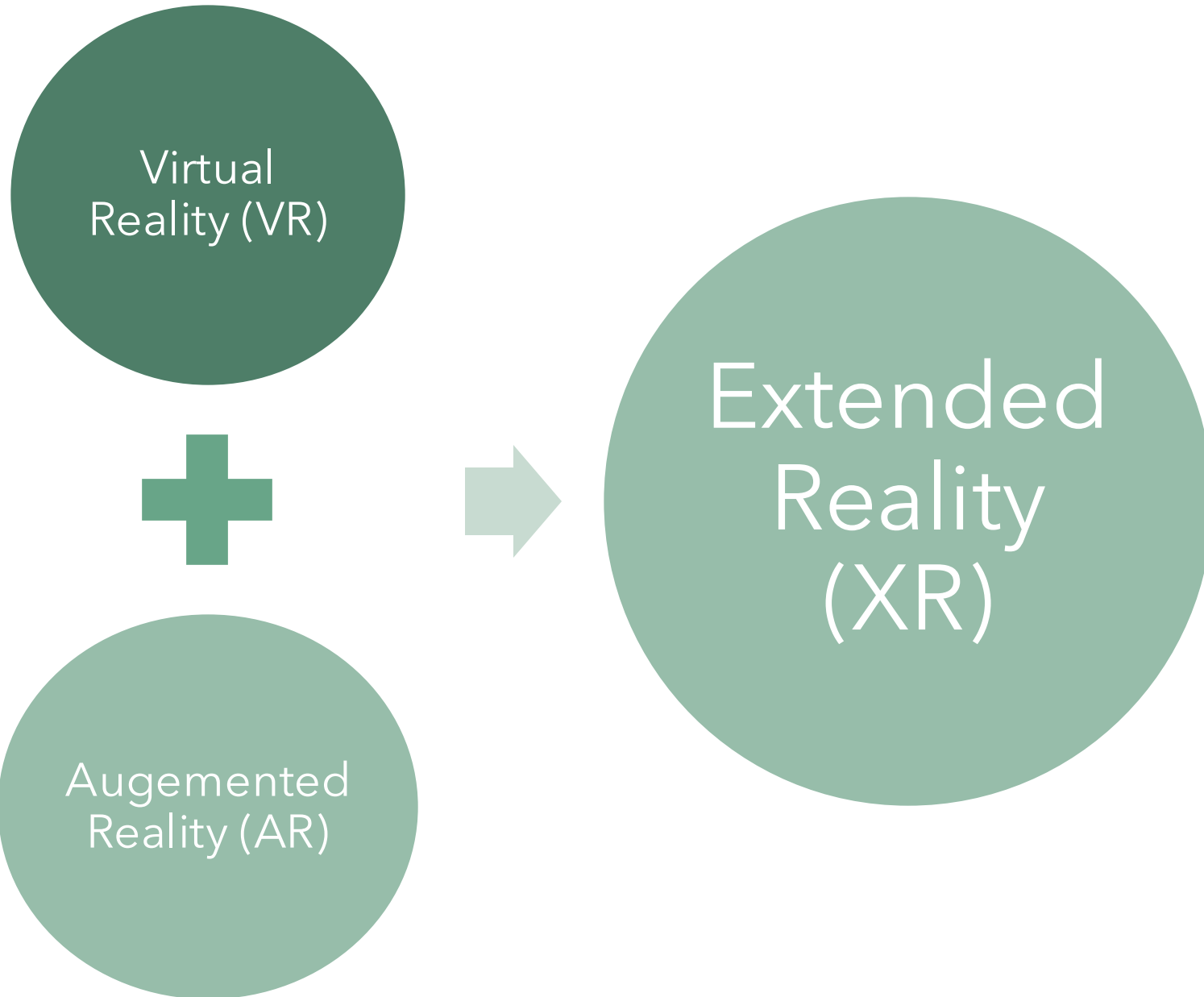
imgflip.com



$$x^2 + 1 = 0$$



imgflip.com



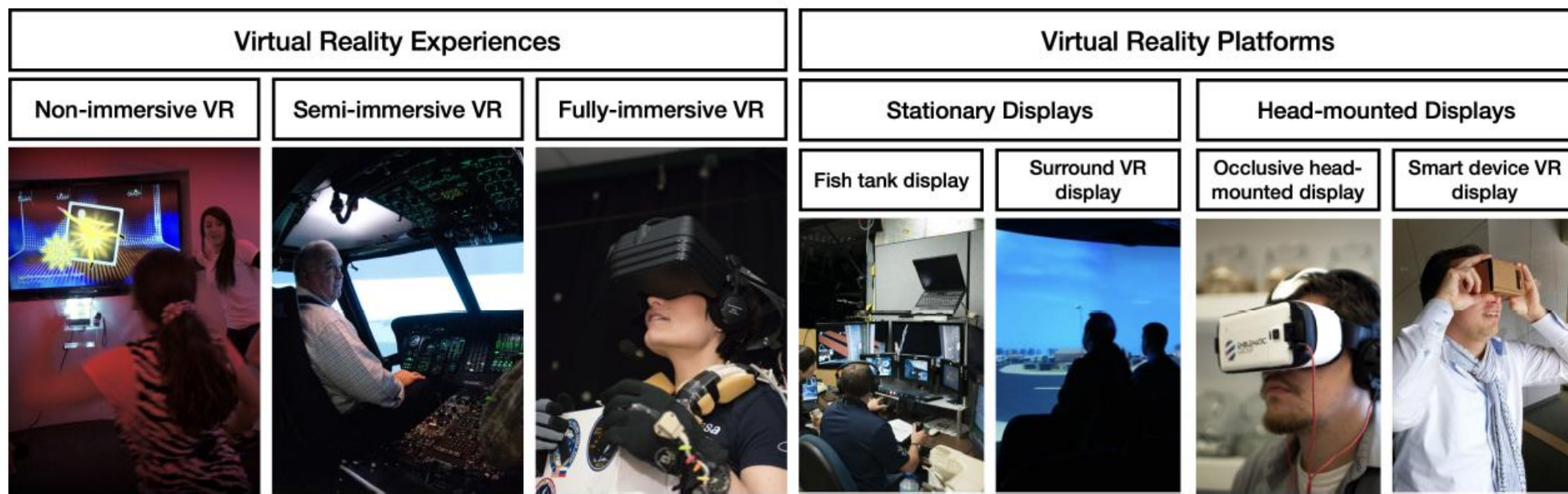


FIGURE 1. Types of virtual reality experiences and accompanying platforms. See section on 'Acknowledgement' for the image attributions.

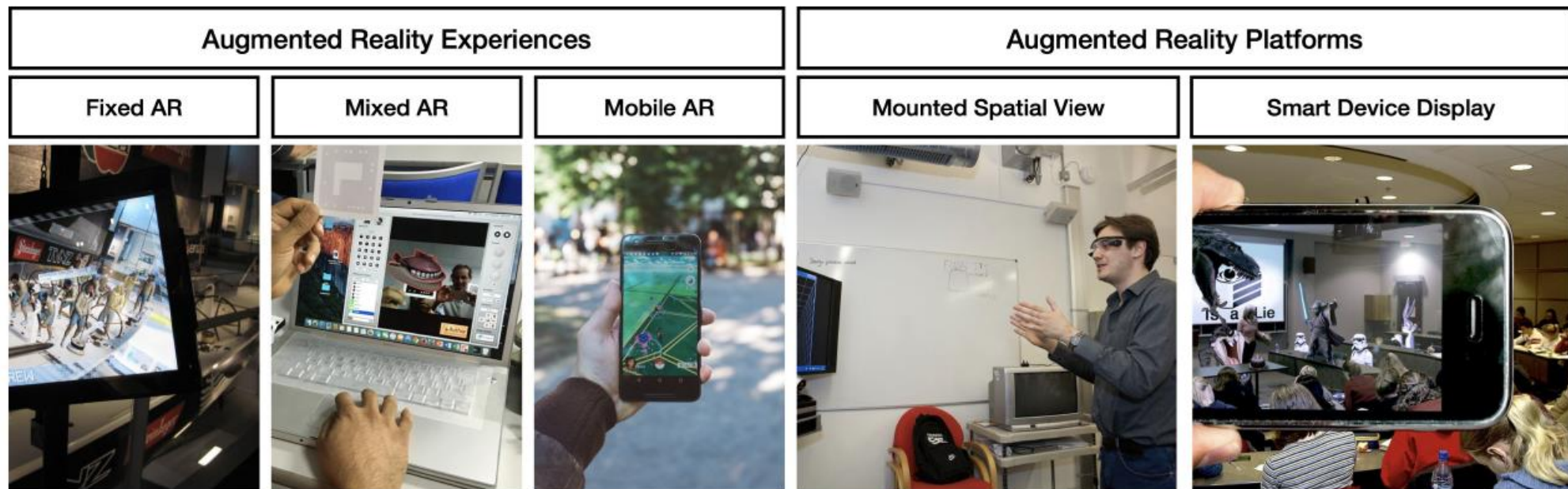
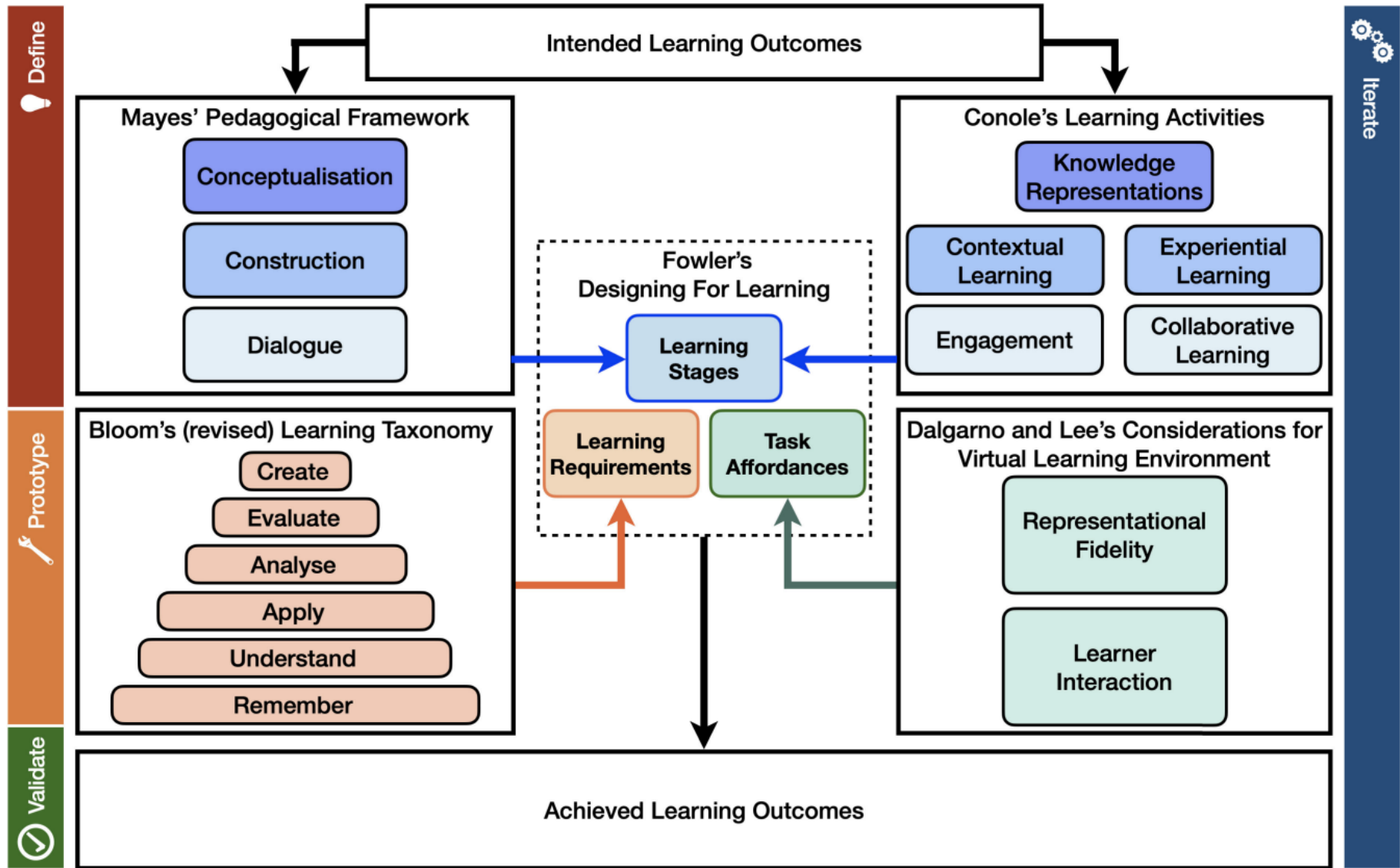


FIGURE 2. Types of augmented reality experiences and accompanying platforms. See section on 'Acknowledgement' for the image attributions.



An enhanced framework for extended reality learning environments

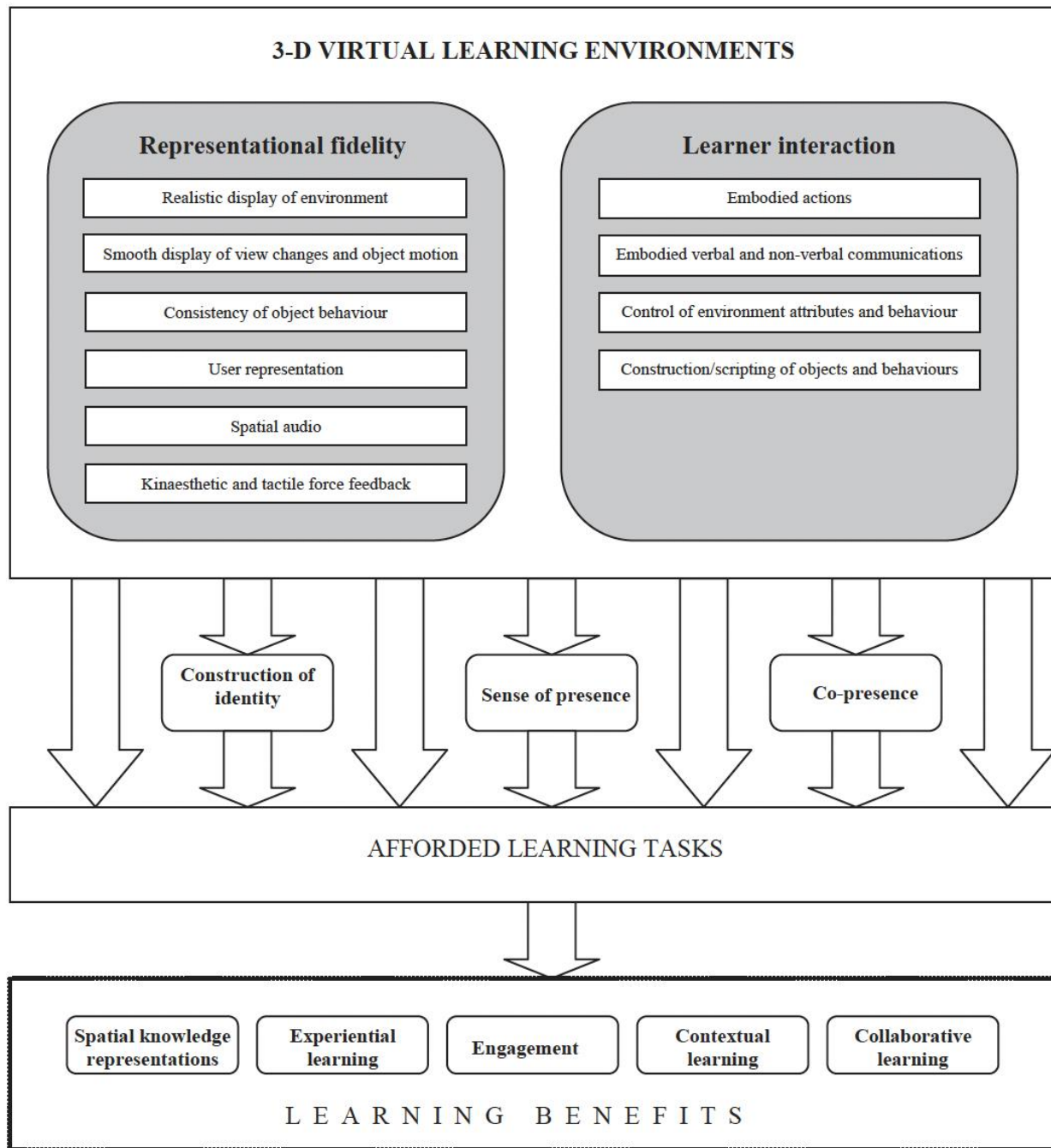


Figure 1: Dalgarno and Lee's elaborated model of learning in a 3-D VLE

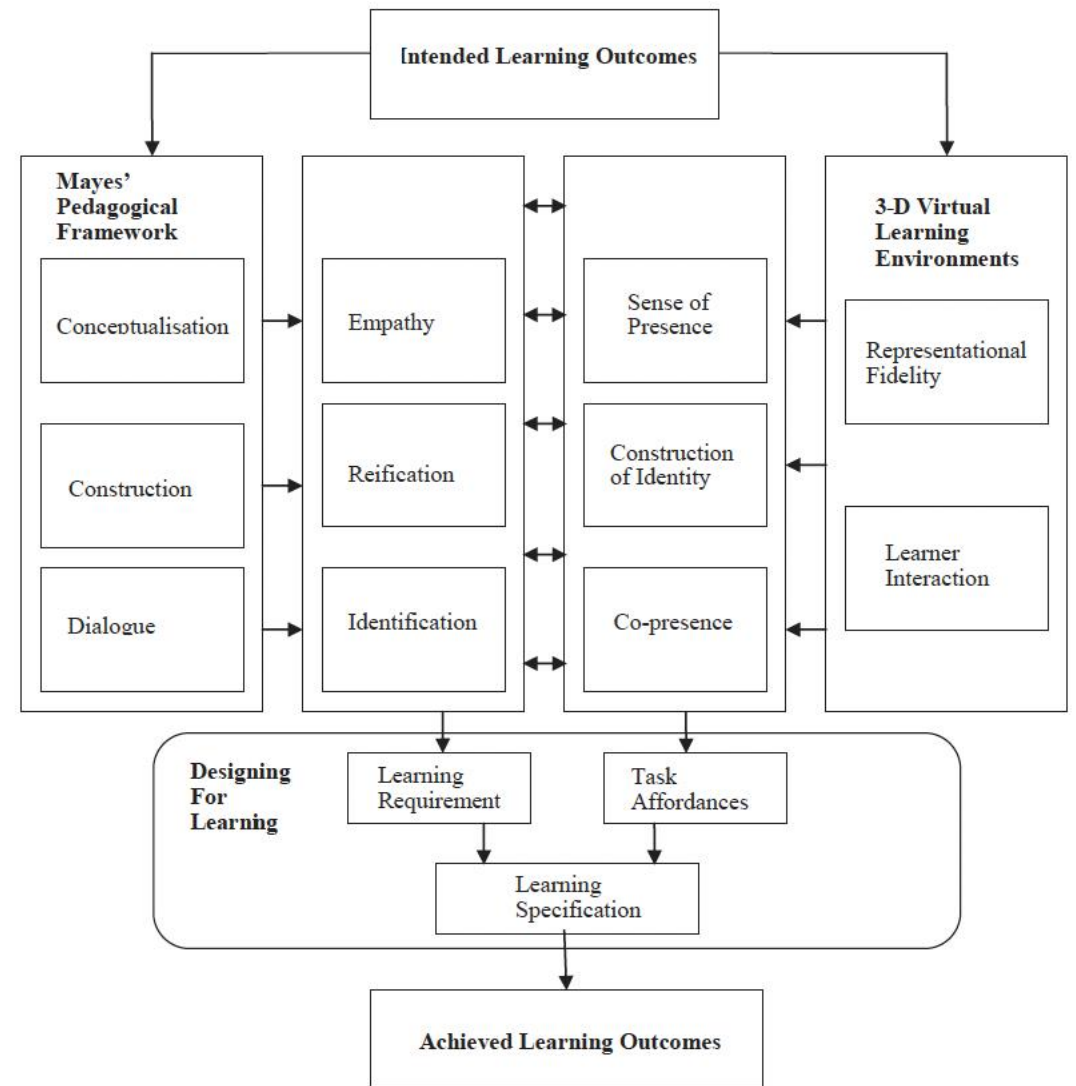


Figure 2: An enhanced model of learning in 3-D VLEs

Augmented Reality - MergeCube

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Collection Code: 6RB6DR

Virtual Reality - Calculus VR

