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Inspiring Actions for Successful Engineering Education



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Who am I?

- Engineer by training, teacher by choice
- 33 years of teaching experience
 - Multiple countries, languages, and levels
 - Brazil, Spain, USA, India, Austria
 - English, Portuguese, Spanish
 - From high-school to PhD + outreach (Lifelong Learning)
- Broad portfolio of courses under CS, IT and ECE
- Enthusiastic adopter of new tools and technologies
- Involved in online learning since late 1990s

My goal (for this talk)

Present a series of time-tested
best practices and recommendations
for Engineering educators

(12) Actions that can

inspire,

engage, and

promote personal and professional growth
in future engineers.

1. Adopt...

Adopt...

... the best technologies, languages, tools, and apps currently available

There is **no excuse** for using bad / old-fashioned / obsolete tools!

Examples:

- MATLAB and its toolboxes
- Web development languages, editors, IDEs, etc.



2. Curate...

Curate...

... contents (out of millions of useful books, sites, blogs, papers, etc.) in a creative way

The 4 S's of content curation:

- **Search:** define topics and organize sources
- **Select:** only high quality content!
- **Sense making:** annotate, mash up, apply, put in chronological order, add value!
- **Share:** distribute using best channels

Curator

cu·ra·tor/'kyōōrātər/

Noun: A keeper or custodian of a museum or other collection

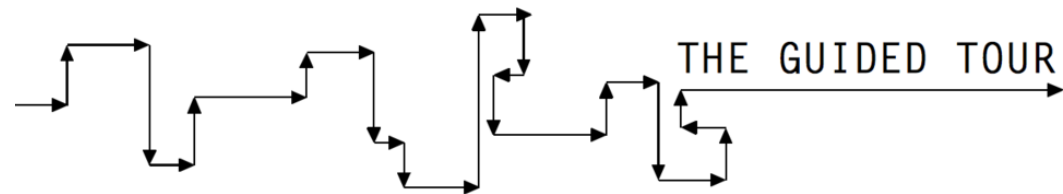
3. Guide...

Guide...

... students through the learning process

“Guided tours”:

- JavaScript
- PHP
- MEAN stack
- Machine Learning
- Deep Learning



4. Reach...

Reach...

... as many students as possible



- 1980s: pre-recorded lectures (Brazil)
- 1990s: video lectures + FedEx + library (FEEDS) (USA)
- 1990s: “virtual classrooms” and homemade web-based solutions
- 2000s: LMS-based solutions (Blackboard, Moodle)
- 2010s: MOOCs (as student), Canvas, mobile-first

5. Communicate...

Communicate...

...clearly and frequently, using every possible tool

- Skype, FaceTime, Google Hangout, WhatsApp
- Discussion Board forums (LMS)

• ~~Email? No!~~

SLACK, instead!



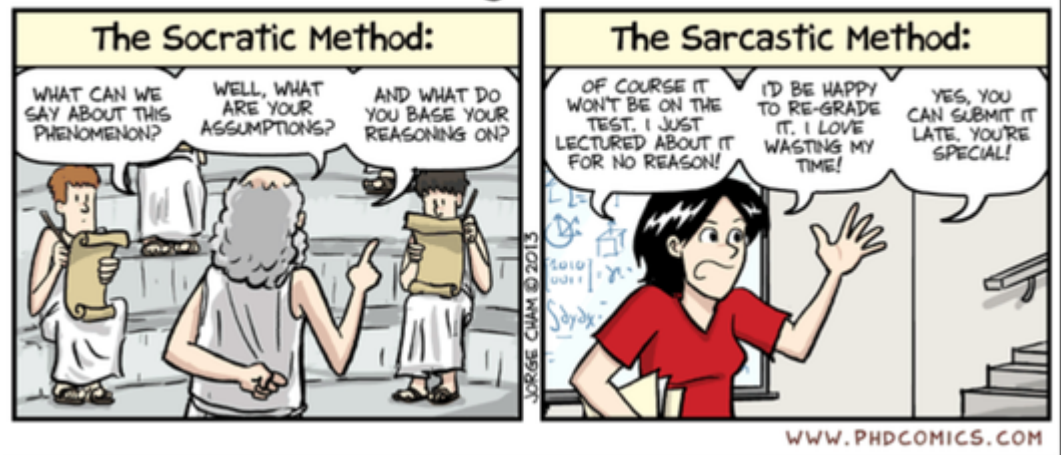
6. Engage...

Engage...

... students in meaningful discussions

- small classes/groups
- discussion board forums
- open-ended questions (**Socratic method**)
- side topics
(e.g., *what is your favorite AI-themed movie?*)

Teaching Methods



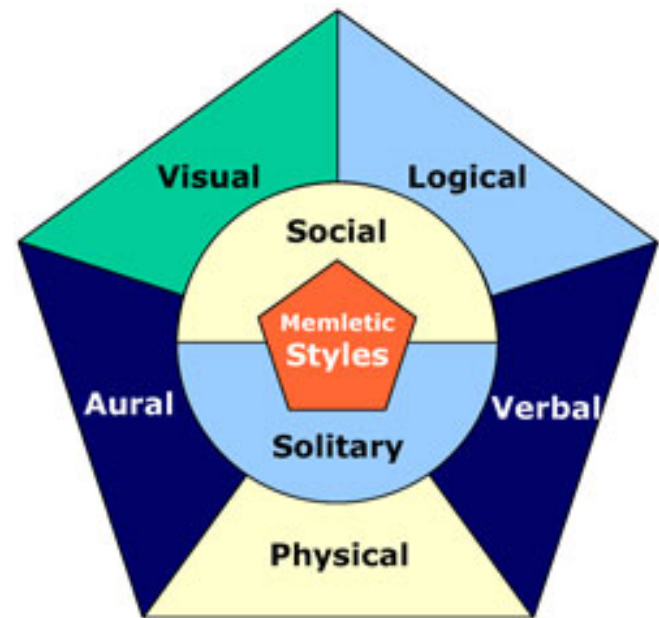
7. Respect...

Respect...

... and accommodate individual traits, background, innate skills, learning styles, etc.

Learning styles:

- Bottom-up vs. Top down
- Structured (book) vs. Unstructured (video)
- Contemporary issues
 - Short attention span, ADHD, etc.



8. Narrow the gap...

Narrow the gap...

... between academia and “real world”

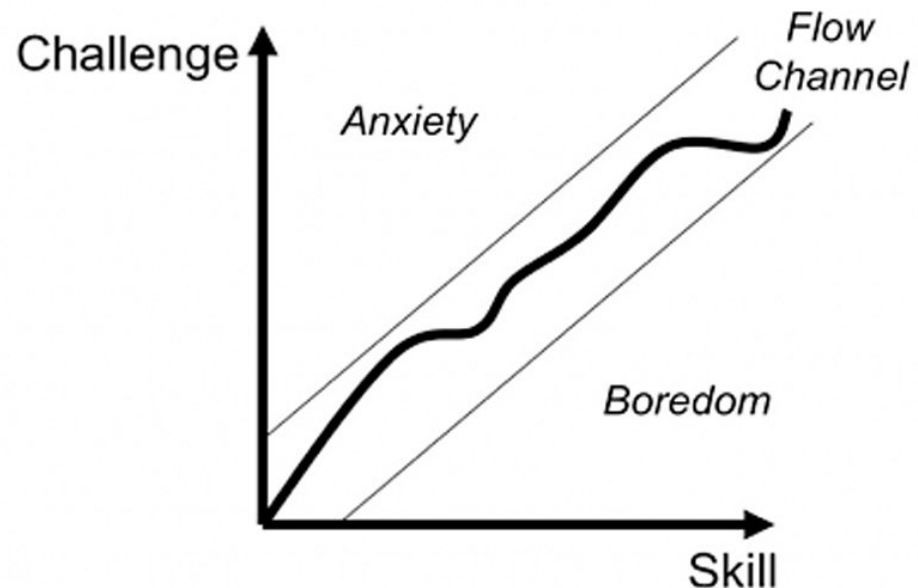
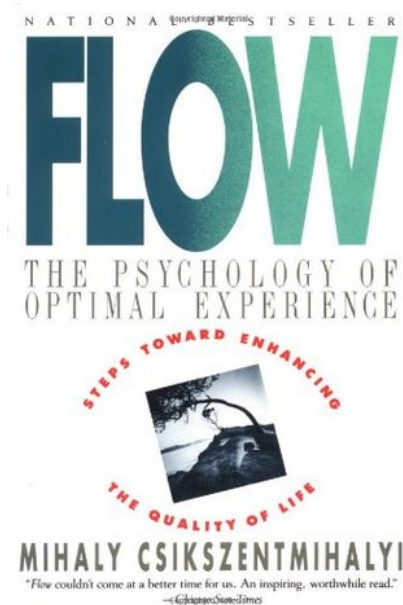
- Meaningful assignments
- Guest speakers
- Technical visits
- Expo / Project showcase



9. Challenge...

Challenge...

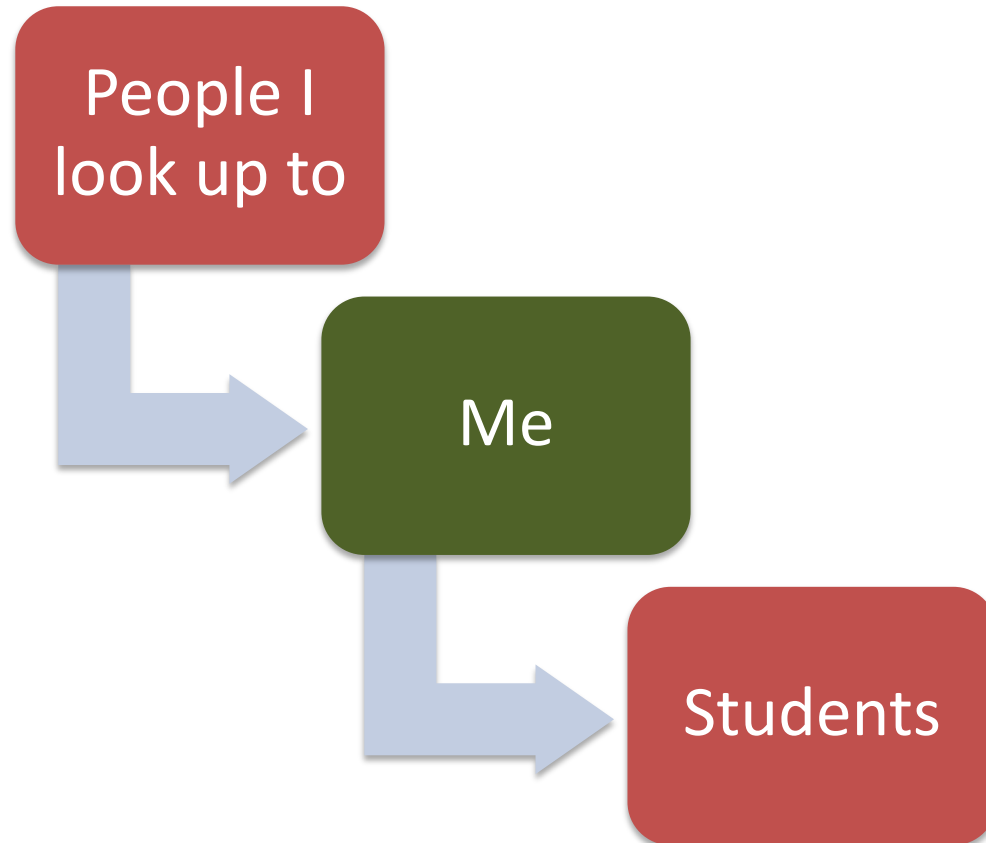
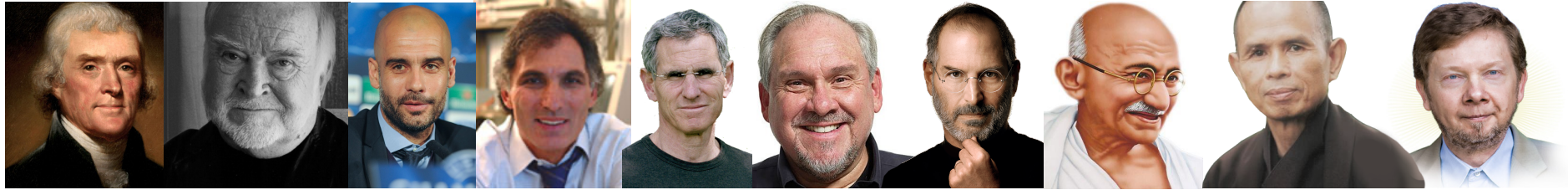
- ... **Assumptions:** you will be (positively) surprised!
- ... **The system:** ask for forgiveness, not permission
- ... **Students** to do more than they thought they could (*Flow*)



"Flow" concept by Mihaly Csikszentmihalyi. Drawn by Senia Maymin.

10. Lead by example...

Lead by example



11. Be flexible...

Be flexible...

... with just about everything!

Things...

- can go wrong
- may take longer than expected to work
- don't always work as planned



12. Let go...

Let go...

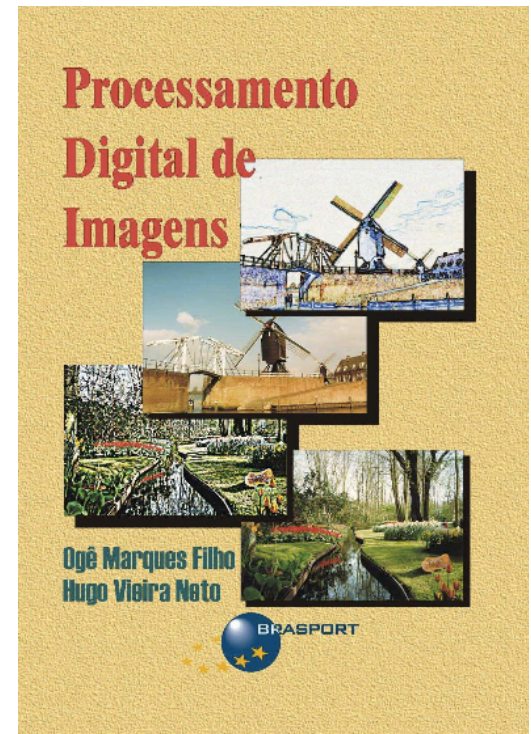
... and let them grow...



Hugo Vieira Neto

Professor of Computer Vision,
Federal University of Technology -
Paraná

Computer Vision, Machine Learning,
Mobile Robotics, Biomedical
Engineering



- PhD in Computer Science (Mobile Robotics), [University of Essex](#), 2006
- MSc in Computer Science (Computer Vision), Federal Center for Technological Education - Paraná, 1998
- BSc in Electrical Engineering, Federal Center for Technological Education - Paraná, 1995

Let go...

... and let them grow...

BIOGRAPHY

Vladimir Nedović was born in Kotor, Montenegro. He obtained his BSc degree in Computer Science from Florida Atlantic University (United States), and MSc and PhD in Artificial Intelligence from University of Amsterdam (The Netherlands). He is a founder of [Flavourspace](#), a food+tech startup in which the team combines passion for food with their passion for digital technologies.



VLADIMIR NEDOVIĆ, PH.D.

CEO, Flavourspace



<http://flavourspace.com/>

One more thing...

Breathe!

Breathe!

(In spirare): mindfulness and meditation help!



Inspirare

-verb

to inspire, breathe into, influence or animate with an idea or purpose, to lift up to greater heights.

Origin:

Latin. From the adverb “in” + spirare (to breathe)

Thank you!



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