HOW TO TEACH HUMANS (WITH MACHINES)

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I WILL EXPLORE THE QUESTION:

How to develop
digital learning devices
that enable people
to learn better and faster

QUESTIONS

1. How do humans learn?
2. How can you help humans to learn better and faster?
3. What are the implications for the development of digital devices

DIGITAL DEVICES?

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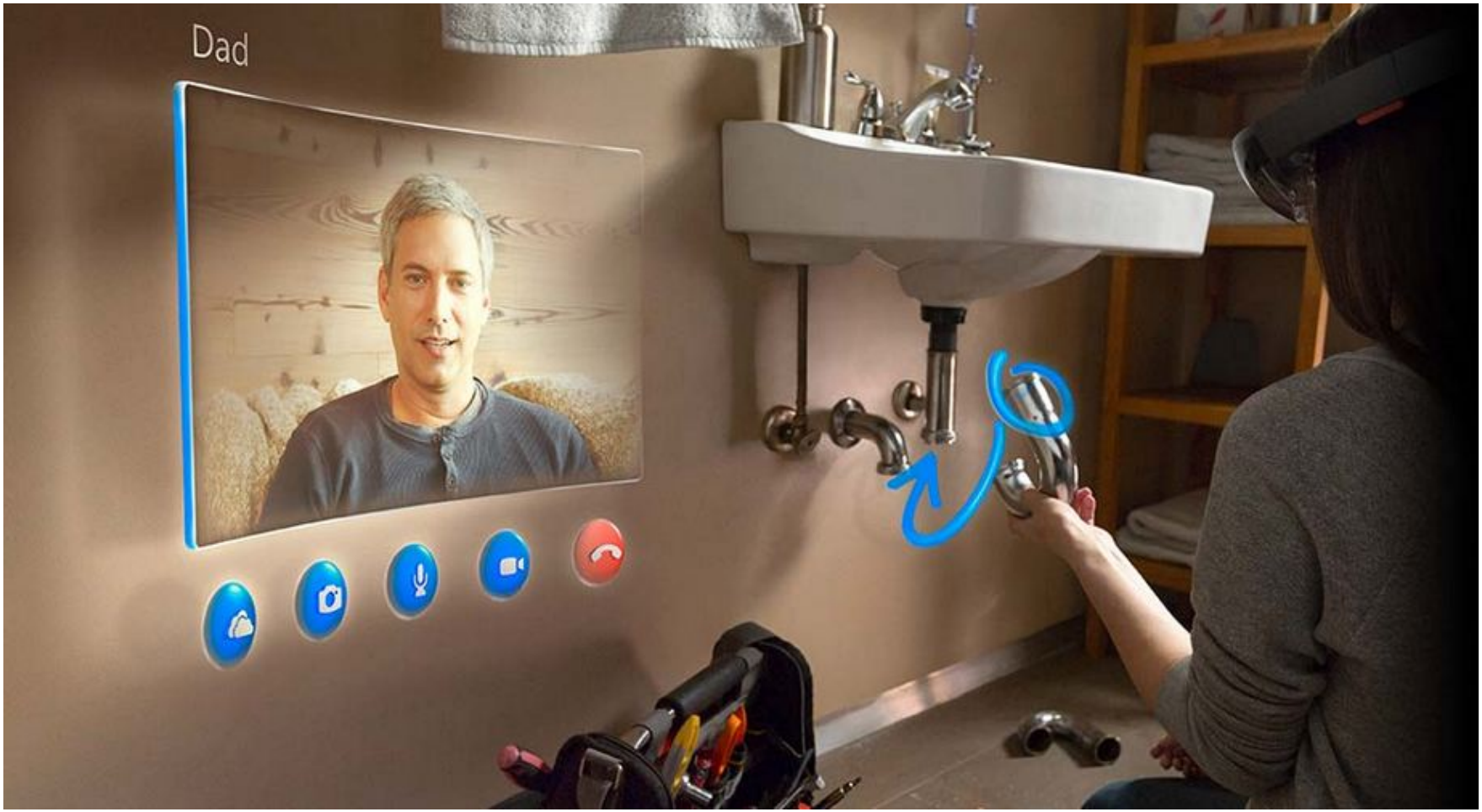


DIGITAL DEVICES?

"INTERNET OF (EDUCATIONAL) THINGS"

DIGITAL DEVICES?

Of course!

It is not the hardware as such, but the applications that run on the hardware

A SHORT PERSONAL STORY

WHAT IS LEARNING?

A change in the
mental representations
of the world

REPRESENTATIONS ARE IN THE BRAIN…

BEHAVIOR & COGNITIVE FUNCTIONS

Ohlson (2011):

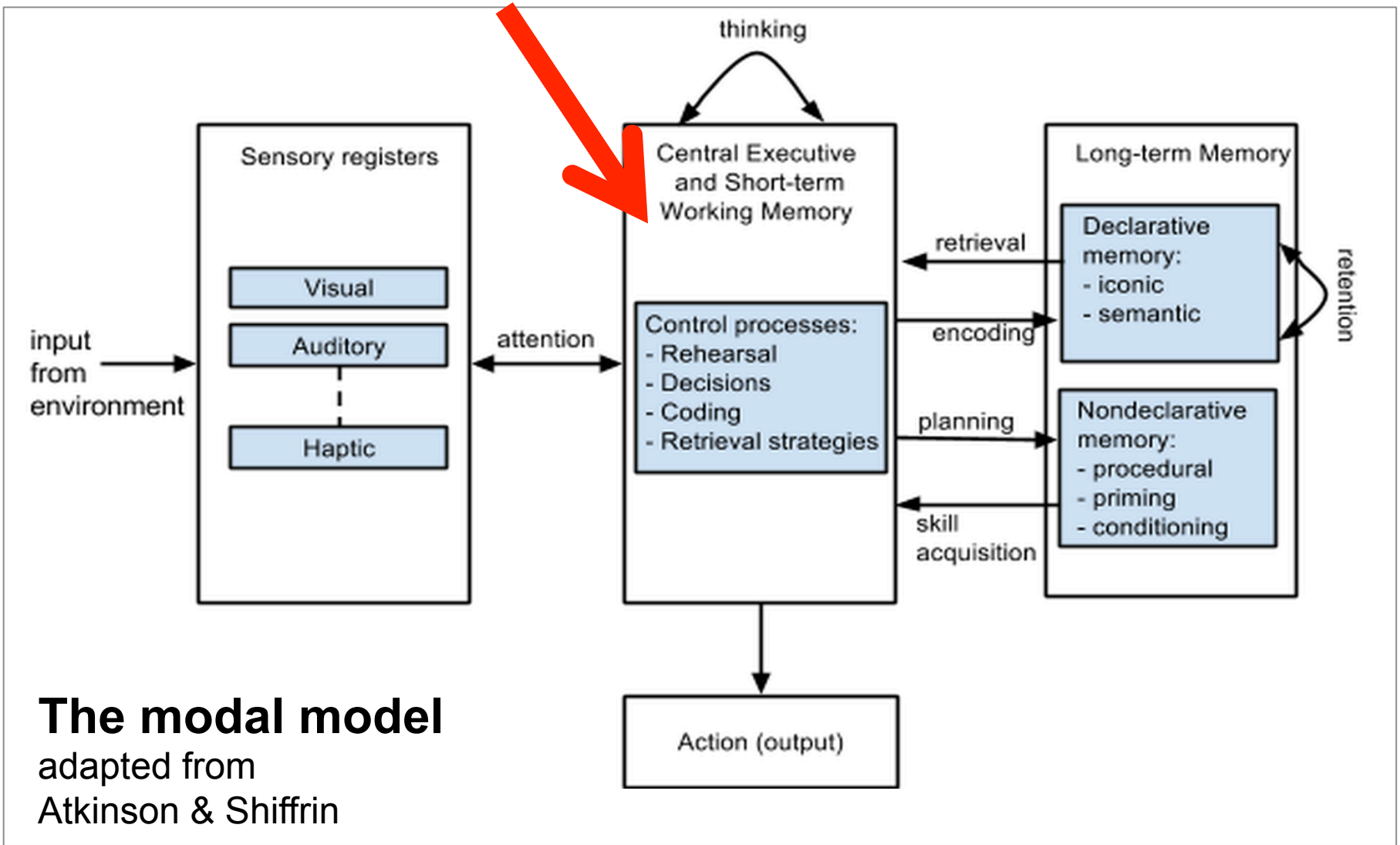
“Differences in representations explain differences in behavior”

“Cognitive functions (like learning, thinking, acting) are implemented by processes that create, utilize and revise representations”

c’est une pipe

TEST:
PICTURE SIMILAR TO REPRESENTATION?

WHERE ARE THE REPRESENTATIONS IN THE COGNITIVE SYSTEM?



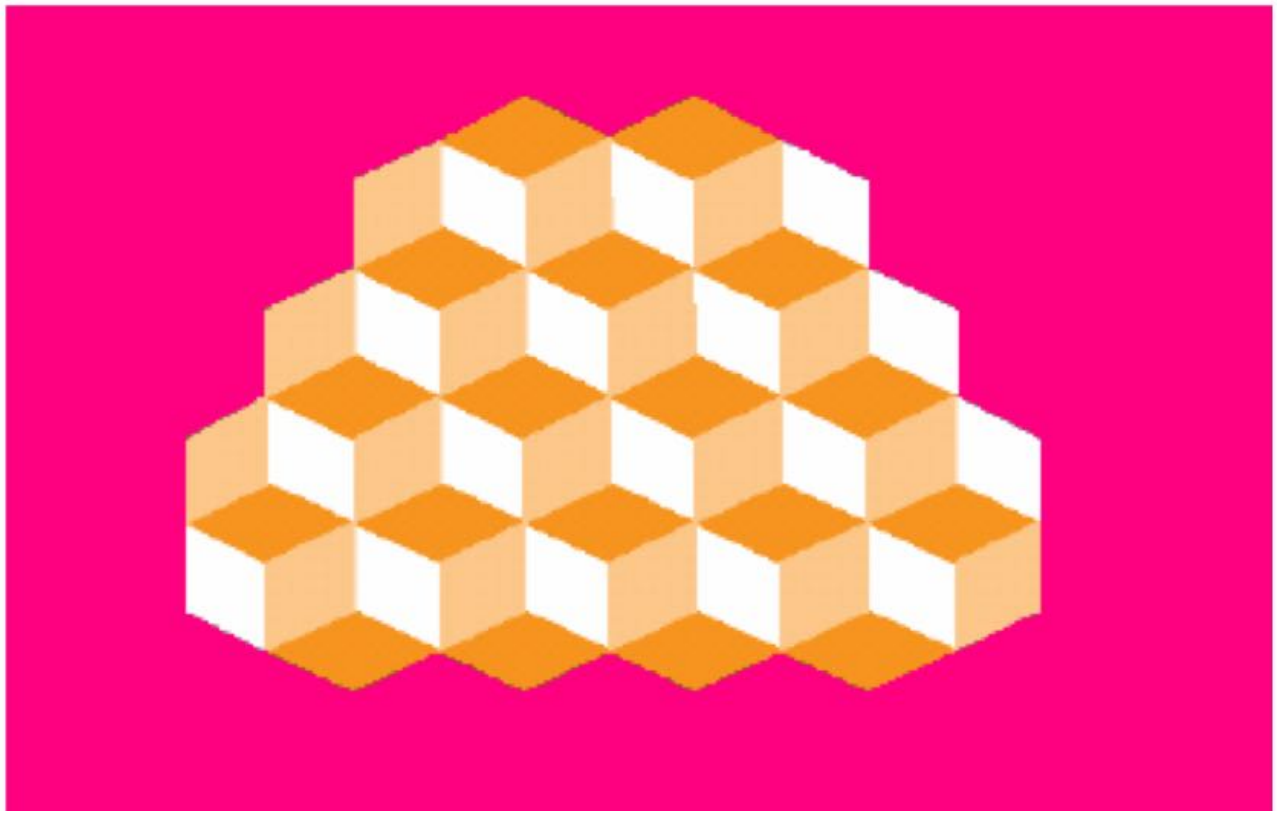
The modal model
adapted from
Atkinson & Shiffrin

CHANGING REPRESENTATIONS

Representations can change automatic and unconsious!

Visual illusions are a great means to *illustrate* this principle. So I will show you two different ones:

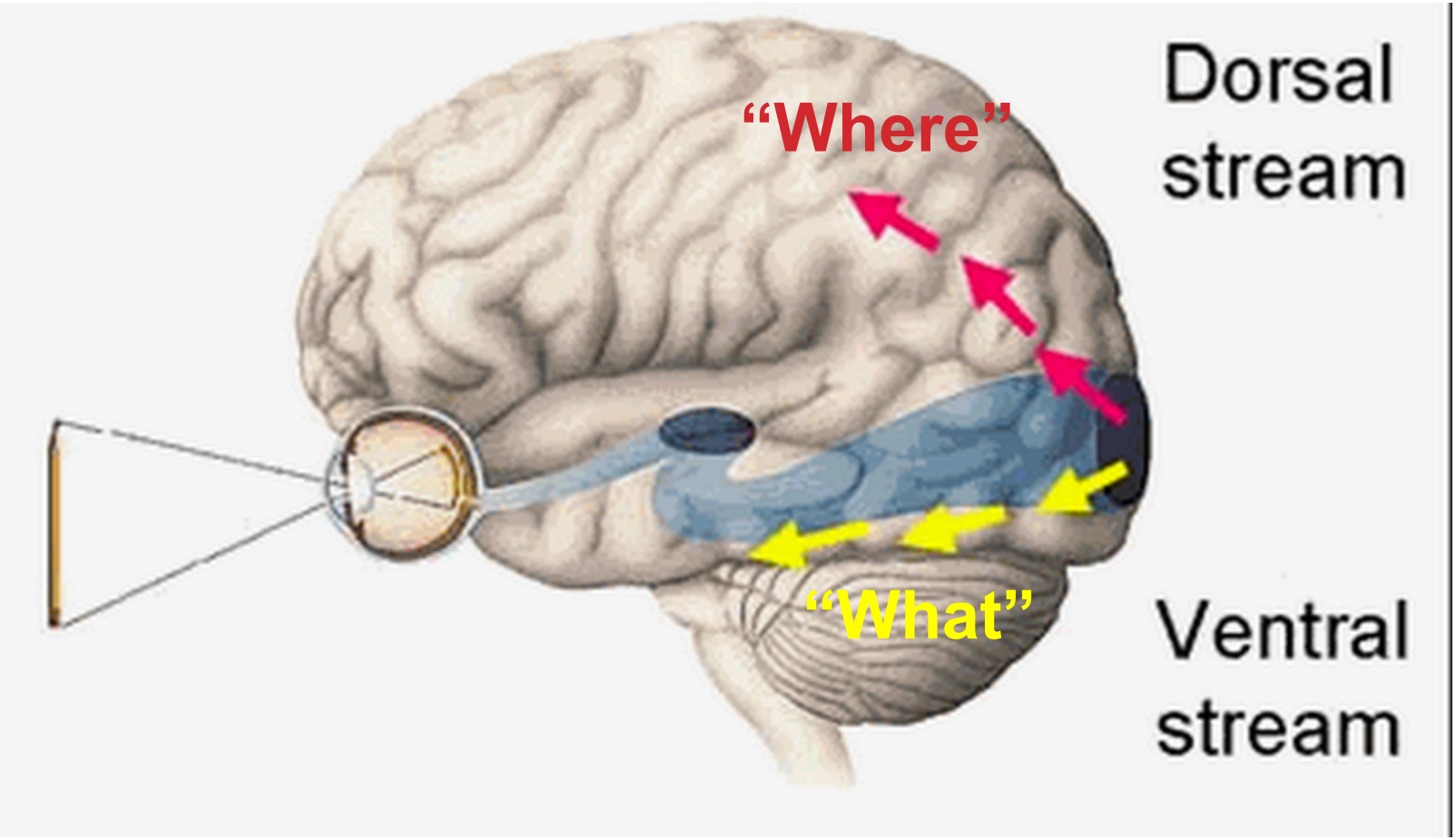
HOW MANY BLOCKS?



SOME REPRESENTATIONS CAN BE HARD TO CHANGE

HOLLOW MASK

WHAT HAPPENS IN THE BRAIN?



THE CHALLENGE OF LEARNING TECHNOLOGIES

Help people to change their mental representations

Learning Better, Learning Faster

THE CONCEPT OF "HUMAN LEARNING INTERFACES" (HLI)

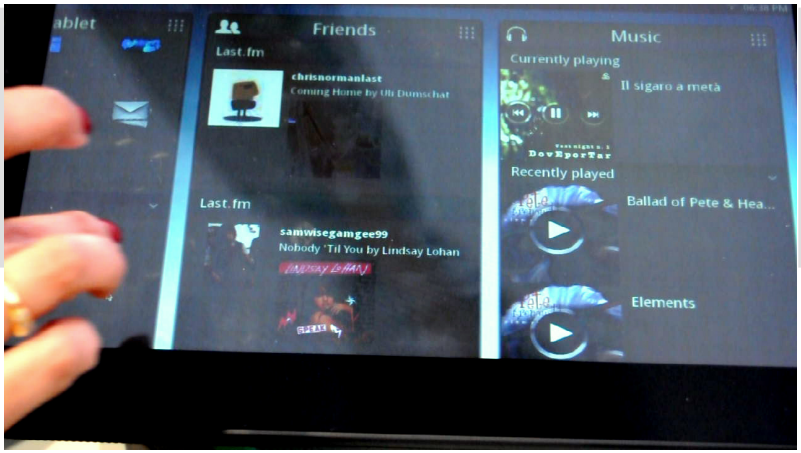
- In Human Computer Interaction the focus on the question "how humans can instruct a machine in order to perform some tasks"

  => User Interface

- In Teaching with technology it is the other way around:
  "how can machines instruct humans to support learning, i.e. change representations"

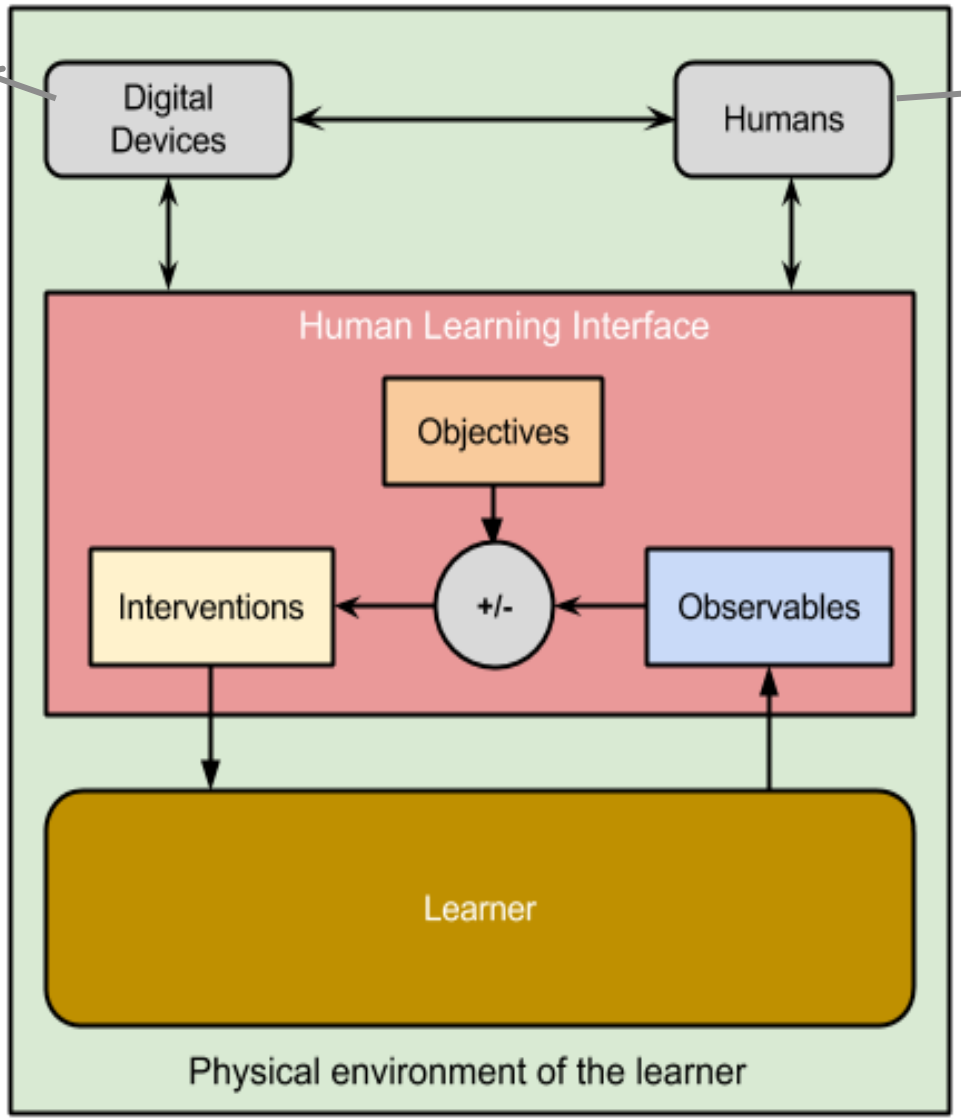
  => Human Learning Interface

THE CONCEPT OF "HUMAN LEARNING INTERFACES" (HLI)

User Interface	Human (Learning) Interface
	

THE CONCEPT OF "HUMAN LEARNING INTERFACES" (HLI)

e.g., Apps on Laptops, Smart boards, Robots, HUDs, Mobiles, Wearables, Smart 'things'



e.g., Teachers, Parents, Peers

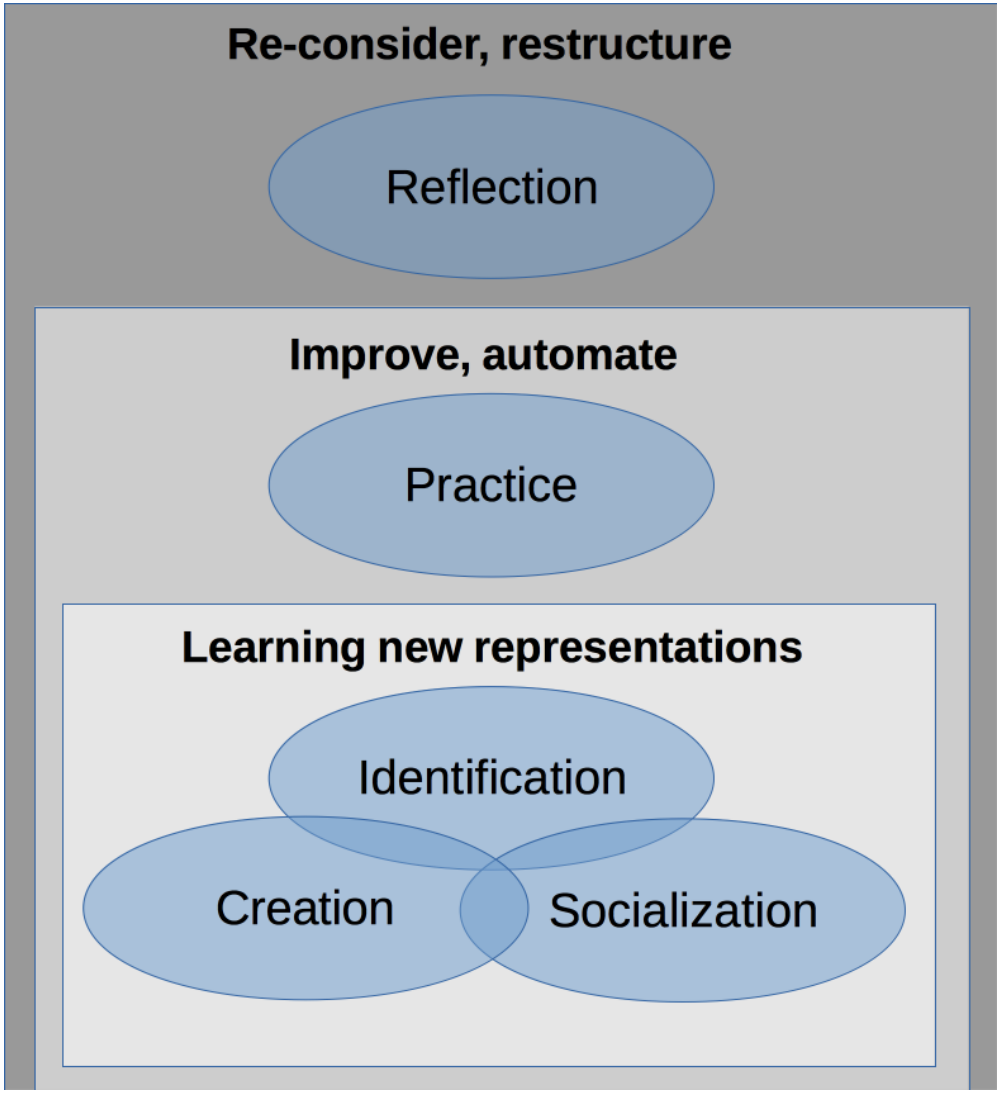
INTERVENTIONS

Building blocks of interventions

1. **Ask the learner a question**
2. **Assign a task to the learner**
3. **Provide something to the learner (information, materials)**
4. **Conditioning of the environment (eg, incentives)**

In order to implement educational software, all of these basic interventions should be available.

5 TYPES OF HUMAN LEARNING INTERFACES EACH WITH THEIR OWN OBJECTIVES



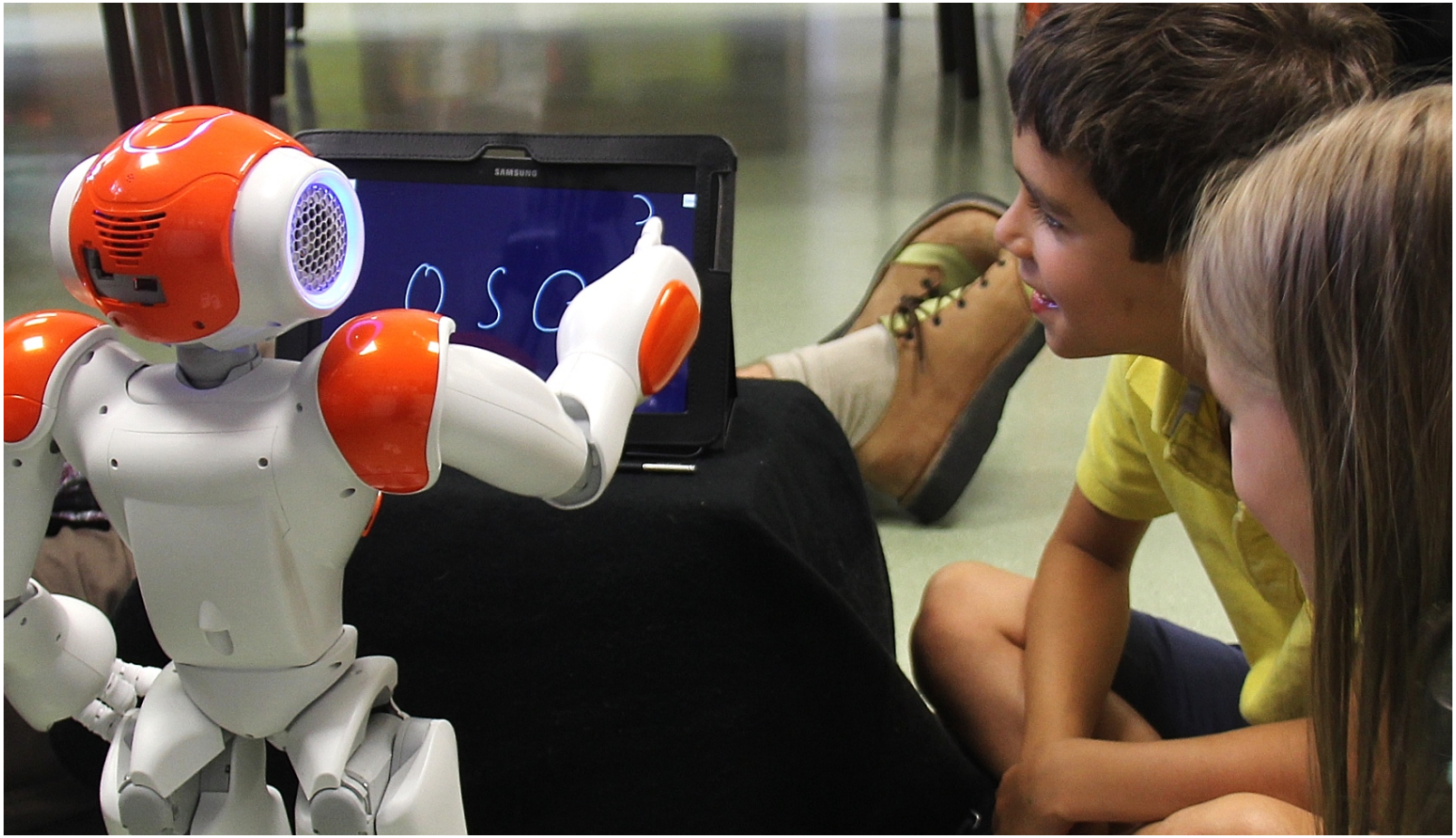
IDENTIFICATION

Learning to represent new situations and events in the world and know how to act and react

IDENTIFICATION

IDENTIFICATION: LABELS AND STORIES

IDENTIFICATION



SOCIALIZATION

Learning to represent the behaviors, habits and culture of a social group enabling you ‘to behave’ within these groups

SOCIALIZATION

SOCIALIZATION

CREATION

Learning to represent new sequences of behavior in order to create something

CREATION

PRACTICE

Learning to represent situations & actions faster and better, as measured through some performance criteria

PRACTICE

REFLECTION

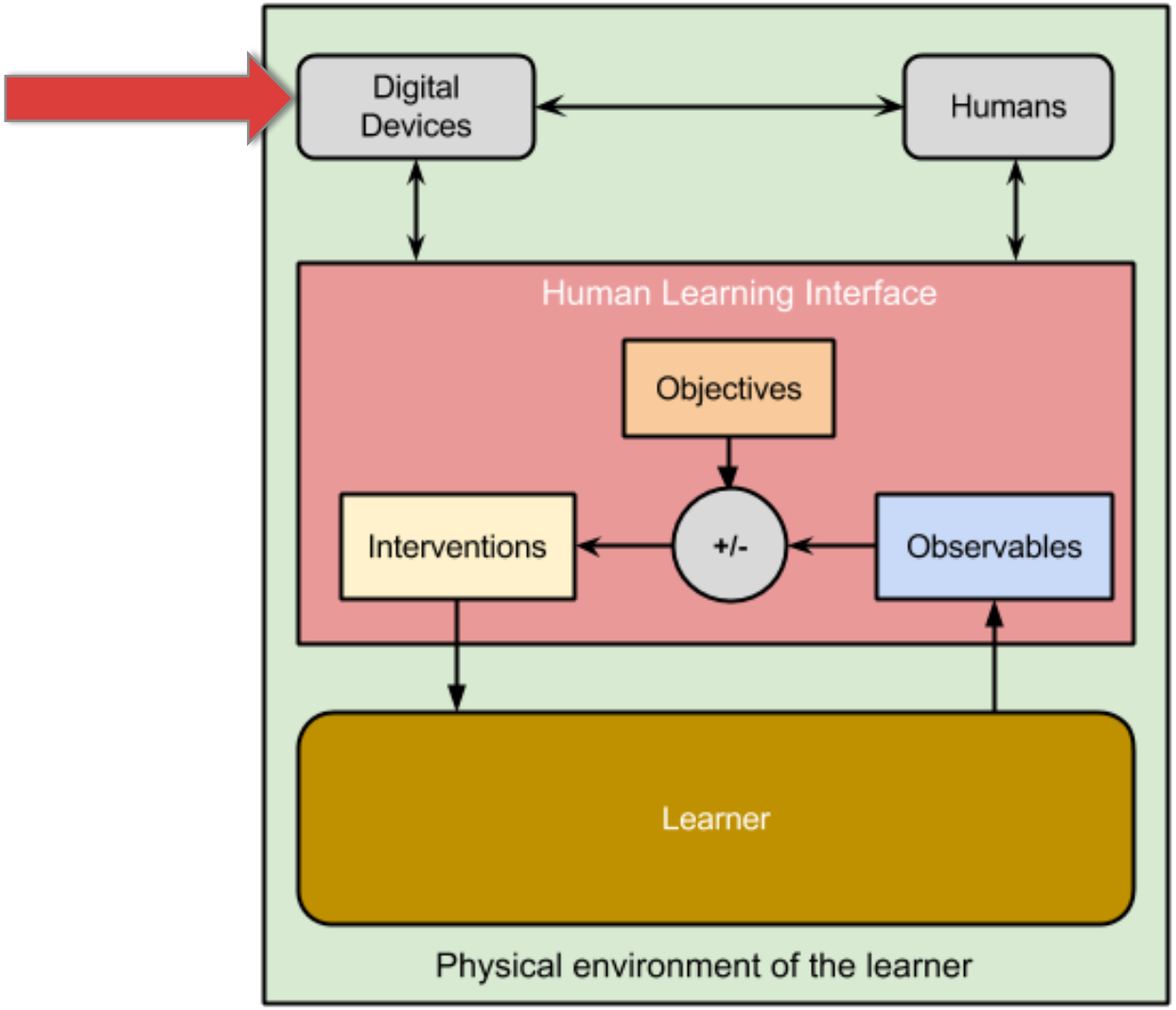
Learning to create representations of representations and to change the initial representations and behaviors

REFLECTION

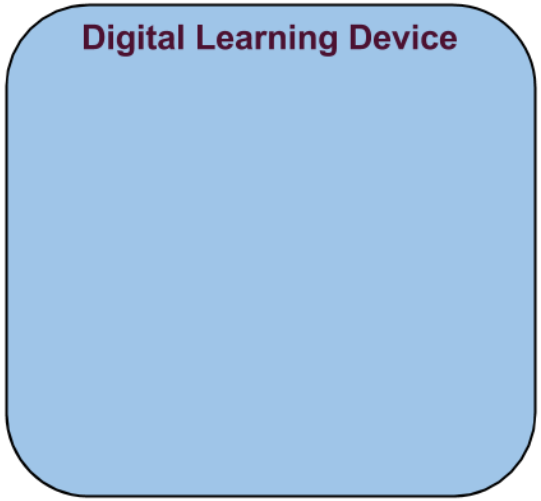
OK, COMING BACK TO THE QUESTION

How to develop
digital learning devices
that enable people
to learn better and faster

ANSWER: UTILIZE HLIs



CORE FUNCTIONS OF A DIGITAL DEVICE THAT CAN TEACH HUMANS



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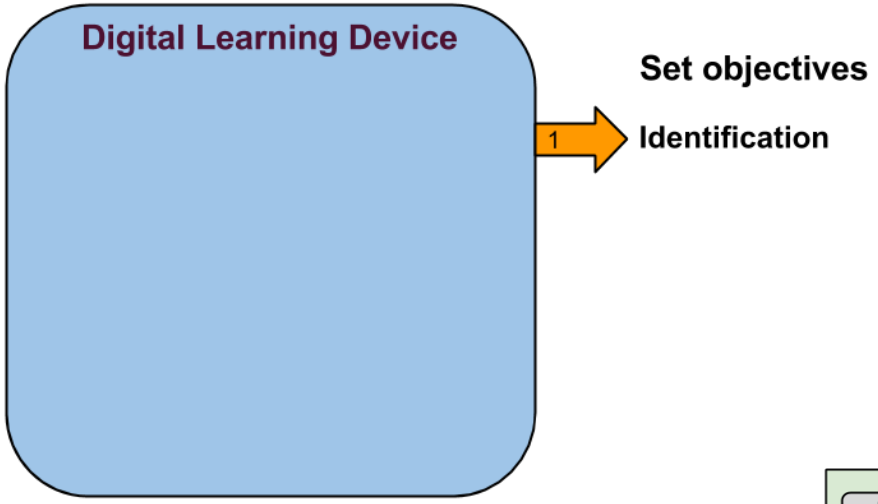

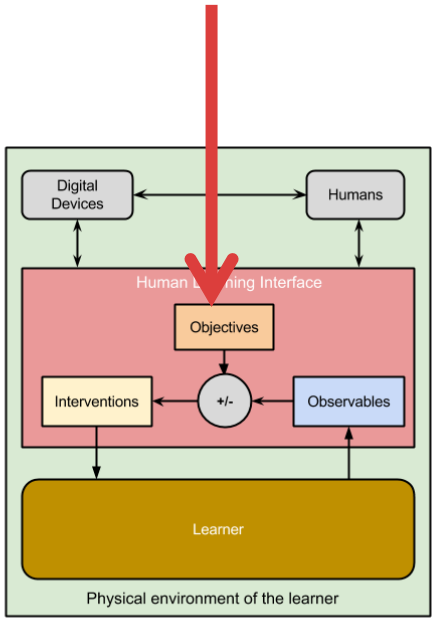

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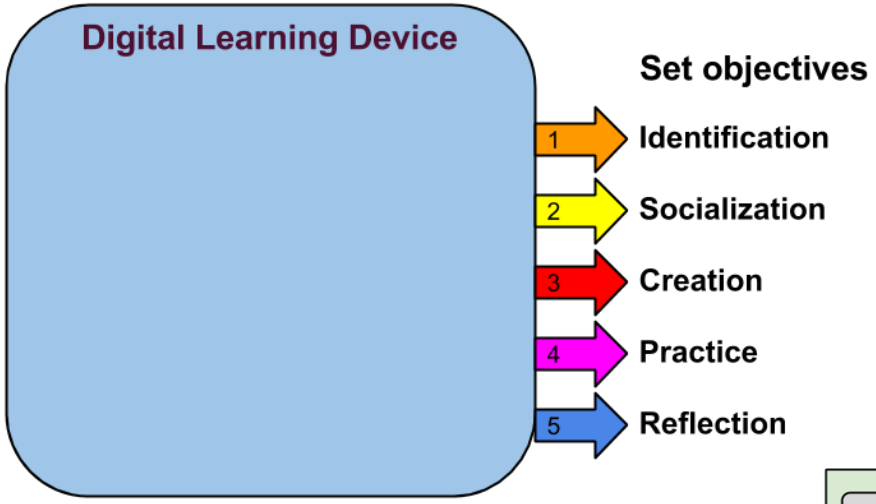

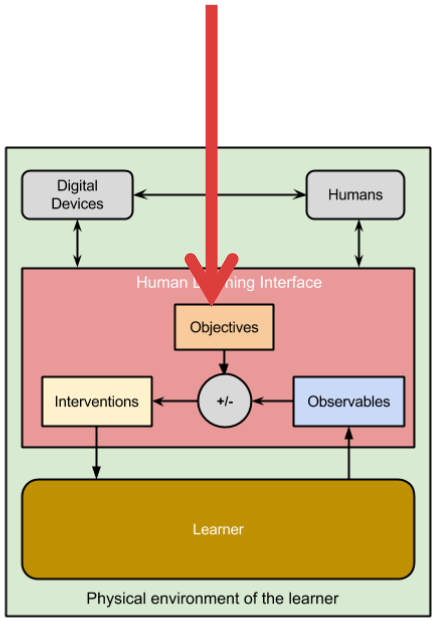

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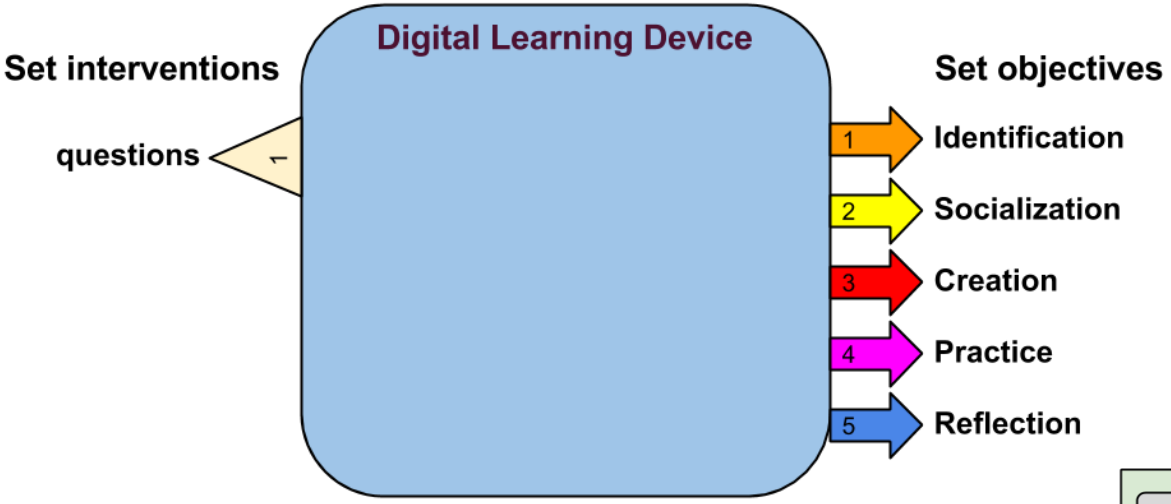

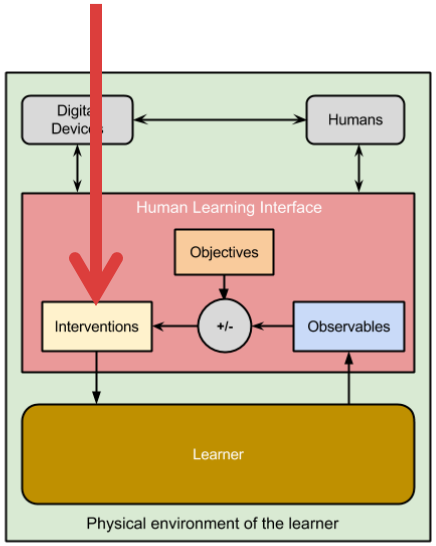

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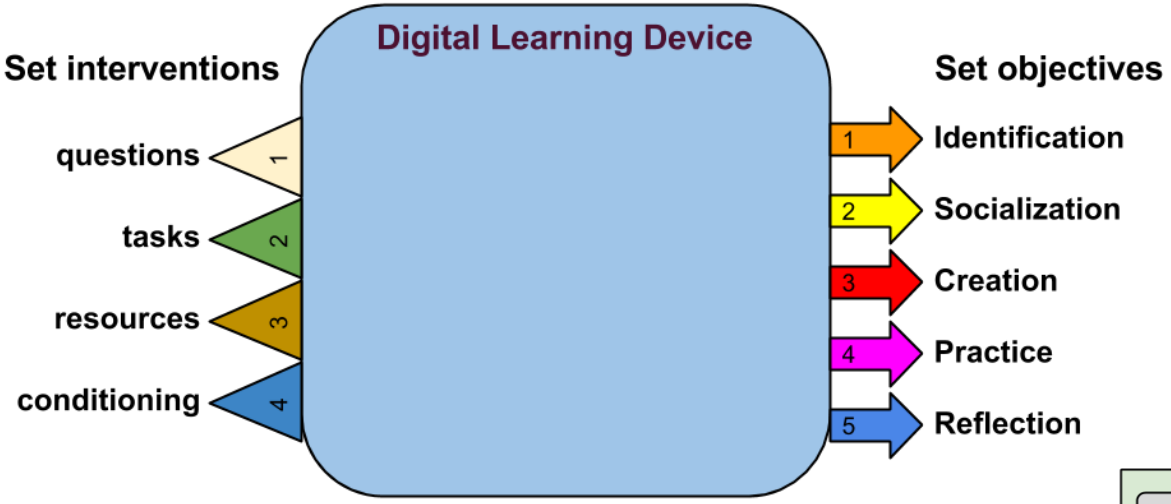

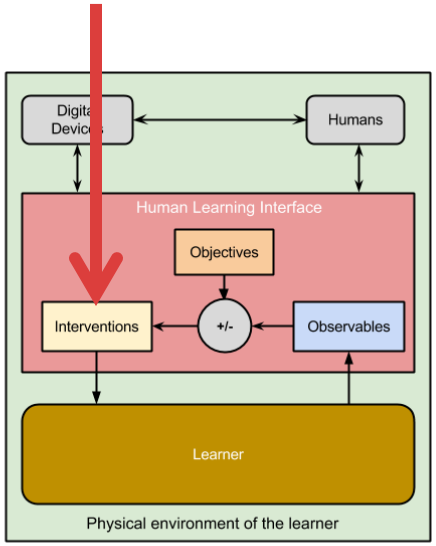

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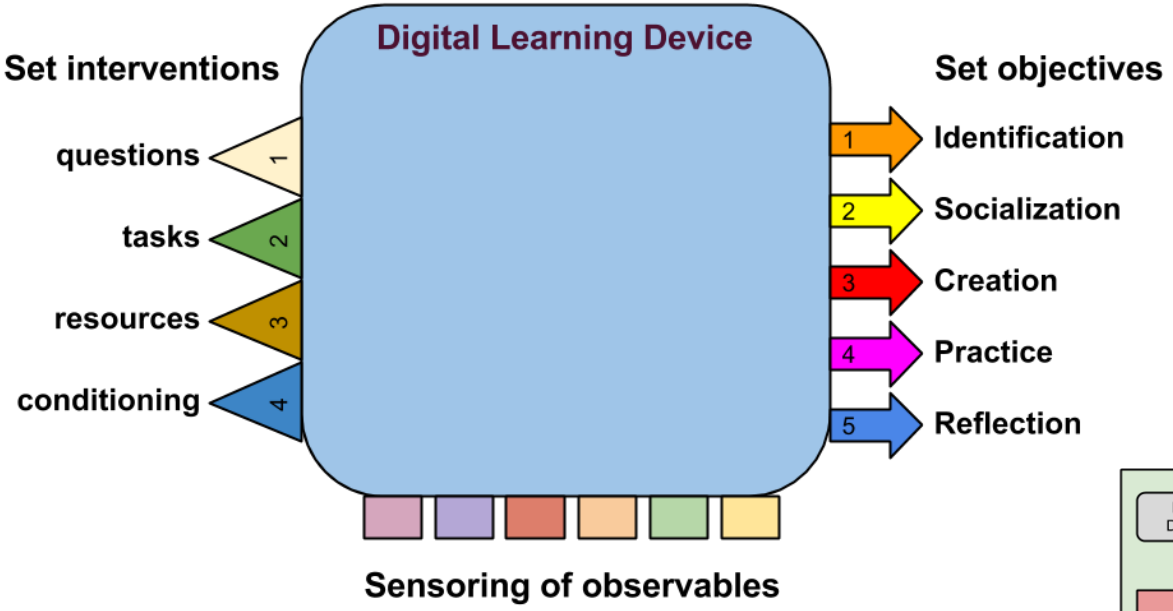

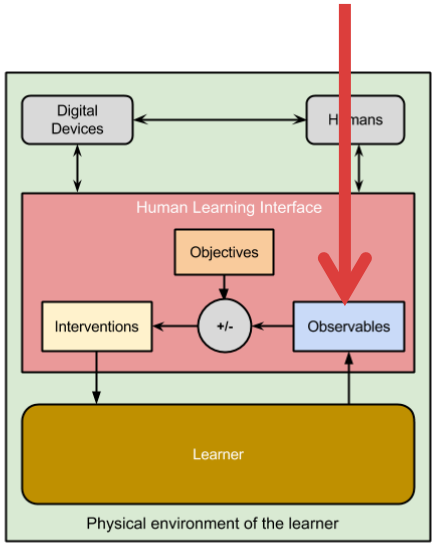

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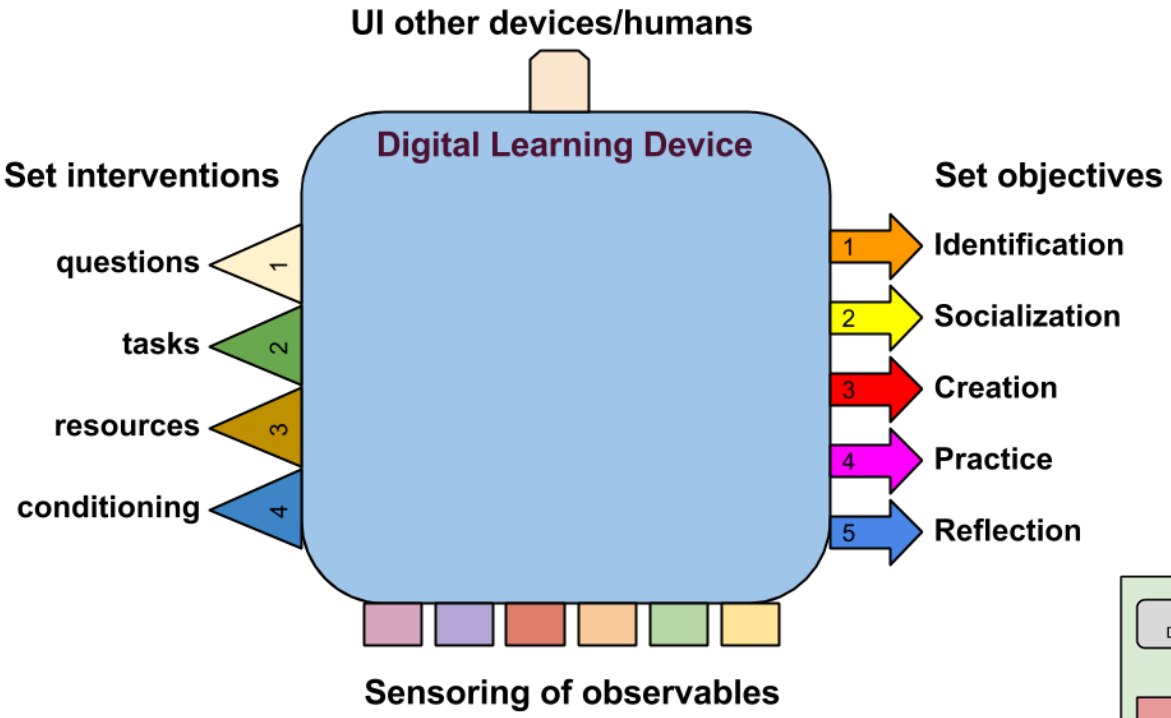

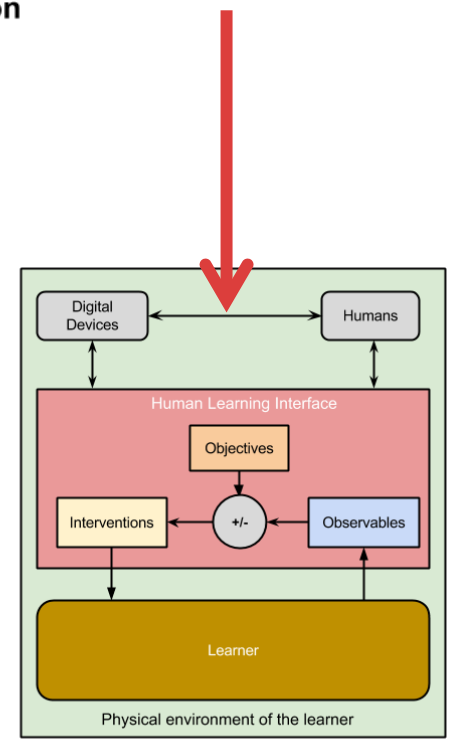

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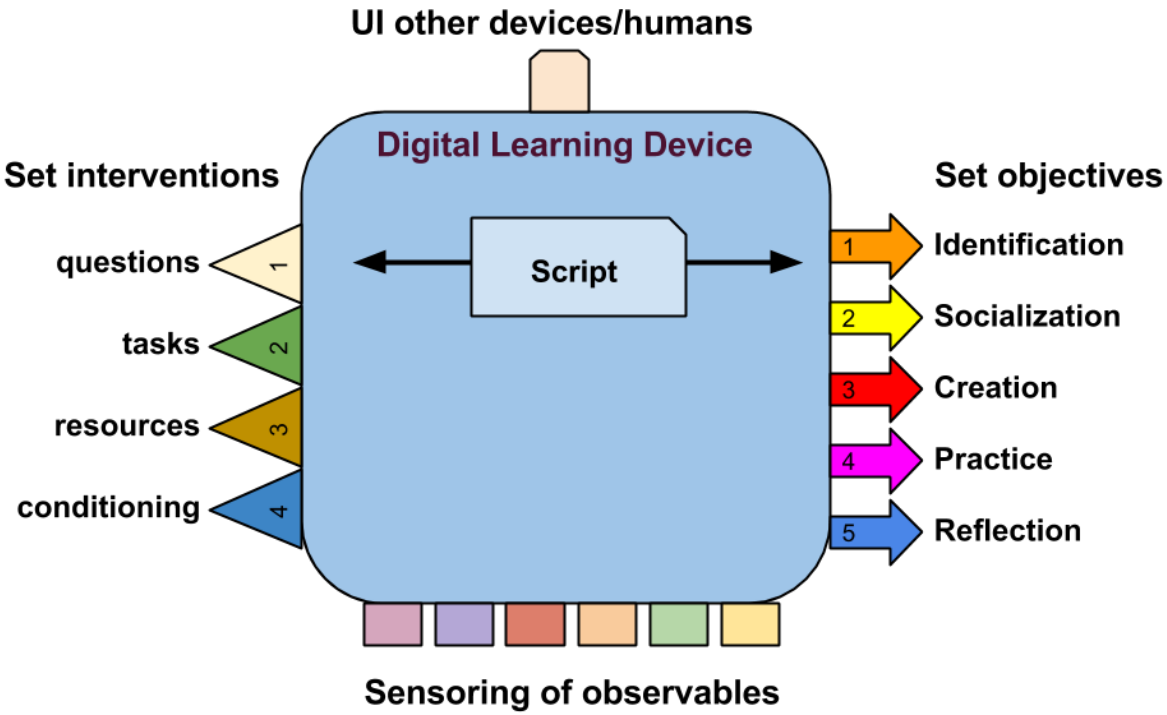

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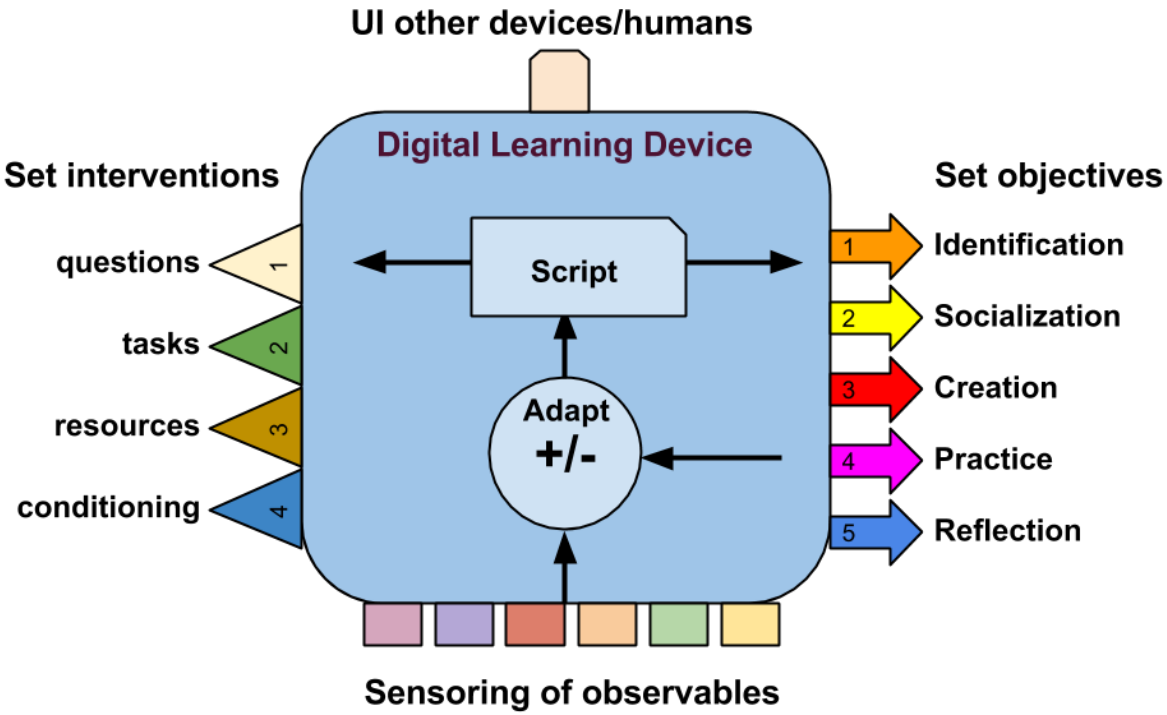
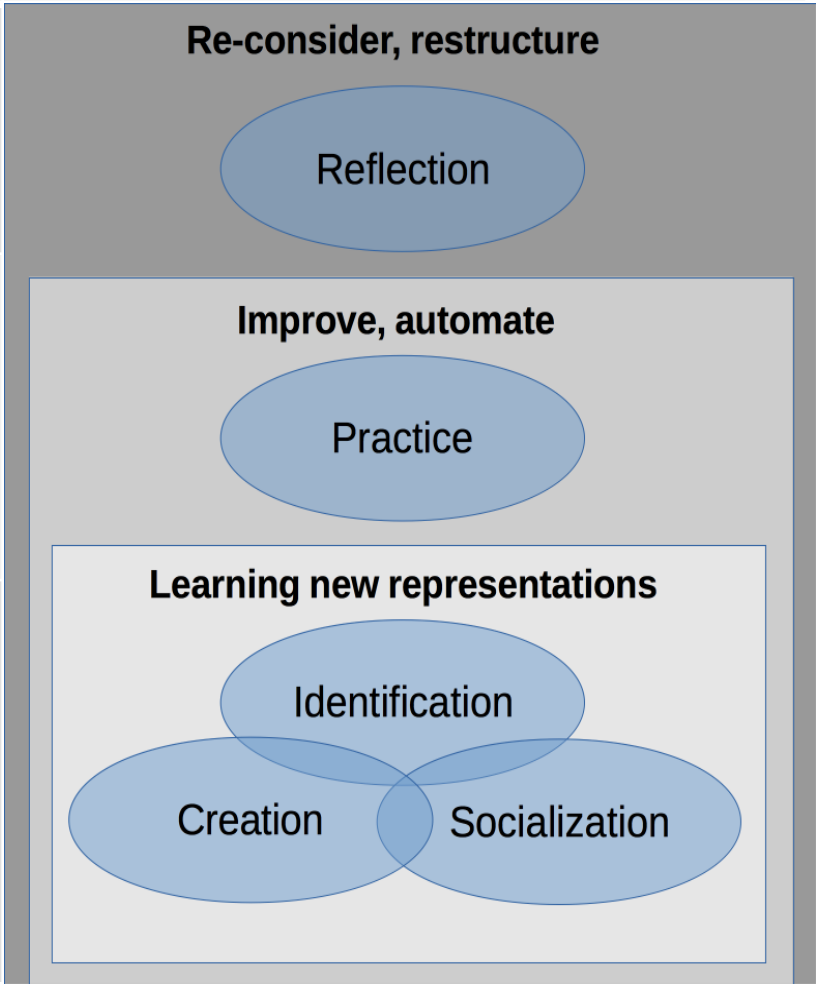


HOW TO TEACH HUMANS TO LEARN BETTER AND FASTER?

Action	Types of HLIs
• Utilize natural learning interfaces to change representations • Make a clear distinction between learning new physical worlds, new social worlds and learning to create • Always combine learning of new representations with sufficient practice and reflection	

THANK YOU!

READ MORE?

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