

# Matching your educational objectives to VR and AR

Experiences with integrating VR and AR in online learning environments

## Workshop programme

MOOC examples

Support at the TU Delft

Blooms taxonomy

Full Reality / Virtual Reality / Augmented Reality / Mixed Reality

Blooms taxonomy  $\longleftrightarrow$  Learning activities that you can do, using different realities

Discussion

IMAGE ABILITY intro video

Week 2  
October 4th - 11th  
COMPARISONS

IMAGE ABILITY MUSEUM

Week 1	Week 2	Week 3	Week 4	Week 5
Inspiration 1	Inspiration 2	Inspiration 3	Inspiration 4	Inspiration 5

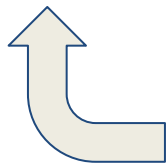
NOW AVAILABLE:  
Feedback for Week 1

Tweets by @DeltVisualX

DeltVisualX @DeltVisualX  
Back in the studio for the week 1 feedback video.  
Many interesting images to discuss.  
You can still participate: [edx.org/course/image-a...](http://edx.org/course/image-a...)

Feedback video for week 1

Museum metaphor



2D platform: Sketchdrive

Sketchdrive

Filter Trash Support Martijn Stellingwerff

The Netherlands  
September 26, 10:08  
by Wouter Vriens

W1/Hungary/Waterfa...  
September 26, 10:08  
by Ag Lantini

my region #1  
September 27, 09:58  
by Jans Beekman

W1  
September 27, 09:58  
by Jans Beekman

M. Moncur, Assignm...  
September 27, 22:07  
by Nigel McCowan

Image  
September 27, 22:07  
by Nigel McCowan

week1  
September 27, 21:54  
by Lorea Ademaers

true or false? PL  
September 27, 16:13  
by Schmitze

Views  
Add new  
Best  
83  
All visuals  
New visuals  
78  
Visuals without feedback  
76

W1 Your IMAGE (ABILITY) ?  
77

W2 Comparisons  
2

W3 Emergence & Imagination  
0

W4 Unravelling Complexity  
0

W5 Style and Expression  
0

Staff  
Invite staff  

- Martijn Stellingwerff (owner)
- Sofiane Garcia
- Peter Kilia
- sketchdrive T.S
- Udo Ouwerkerk

 Course members (124)  
 Invite members  
 Show all members

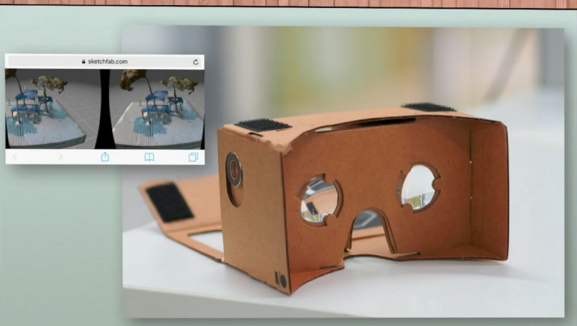


green screen studio  
feedback videos

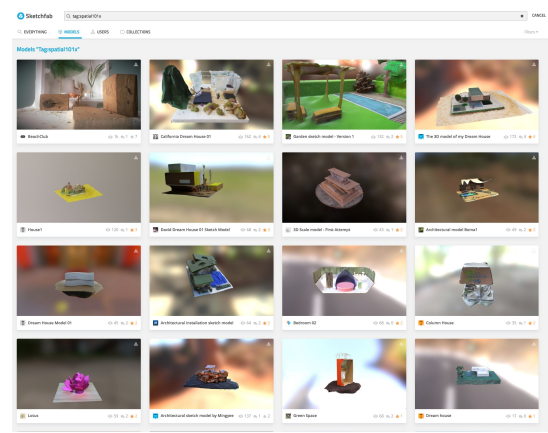
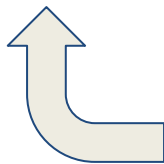


MOOC participants:  
give comments and do  
peer reviews at home

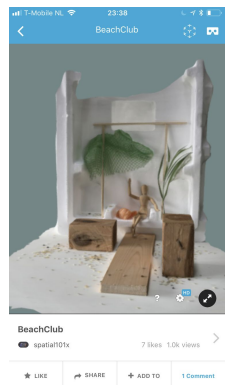
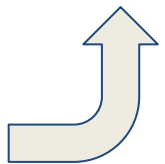
Models in Architecture intro video



3DOF VR  
VR at home



6DOF VR  
feedback videos in mixed reality



3D platform: Sketchfab

monoscopic AR  
new ARkit app



**Extension school / Learning Support / OC Focus**

**Teaching Lab** →

support for teaching staff

e.g. workshops, debates, meetings, exhibitions

**New Media Centre**





sign up for  
the  
VIRTUAL  
PLAYGROUND  
WORKSHOP



## What would you like to do with VR?

- Ontmoet je doelgroep (ontwerpen)  
in VR → in lichaamsafmetingen  
→ plaats de gebruiker  
in je product.  
→ How to build a quick prototype  
with different VR platform  
like Unity, UE, or WebVR?





# The AR & VR Learning Experience Canvas

Title:  
Authors:

Date:

## Learning Activities

What are the learning outcomes?  
Is it a collaborative or individual activity?  
What are the tasks? Describe them step by step.  
How much time is needed to carry out the task(s)?

## Resources

Tools (software apps)  
Equipment/Devices (camera, smartphone, tablet)  
Cardboard

What resources are needed to create the activity?  
What do learners need to carry out the activity?

## Value Propositions

What is the value for the learning process?  
Does it solve any issues?  
What does it improve?  
What opportunities does it unlock?

## Content

Will learners be content (1) consumers or (2) producers?

- (1) What content will be provided for learners?
- (2) What will learners create?

## Learners

For whom are we creating value?

## Partners

Who are your partners?  
What expertise will they bring?  
How will they contribute to the project?  
Are there other stakeholders involved?

## Channels

How does the learner access the activity?  
How are the artefacts/products shared?

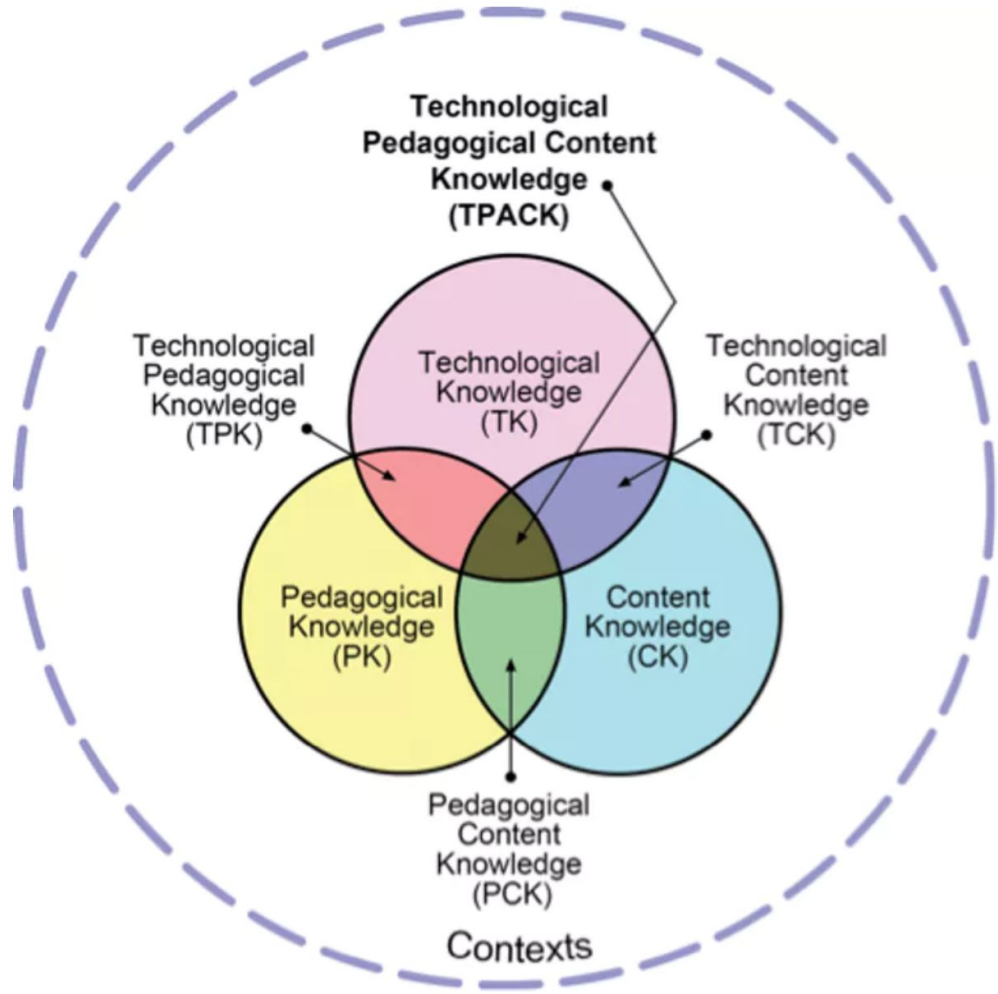
## Costs

Staff and stuff

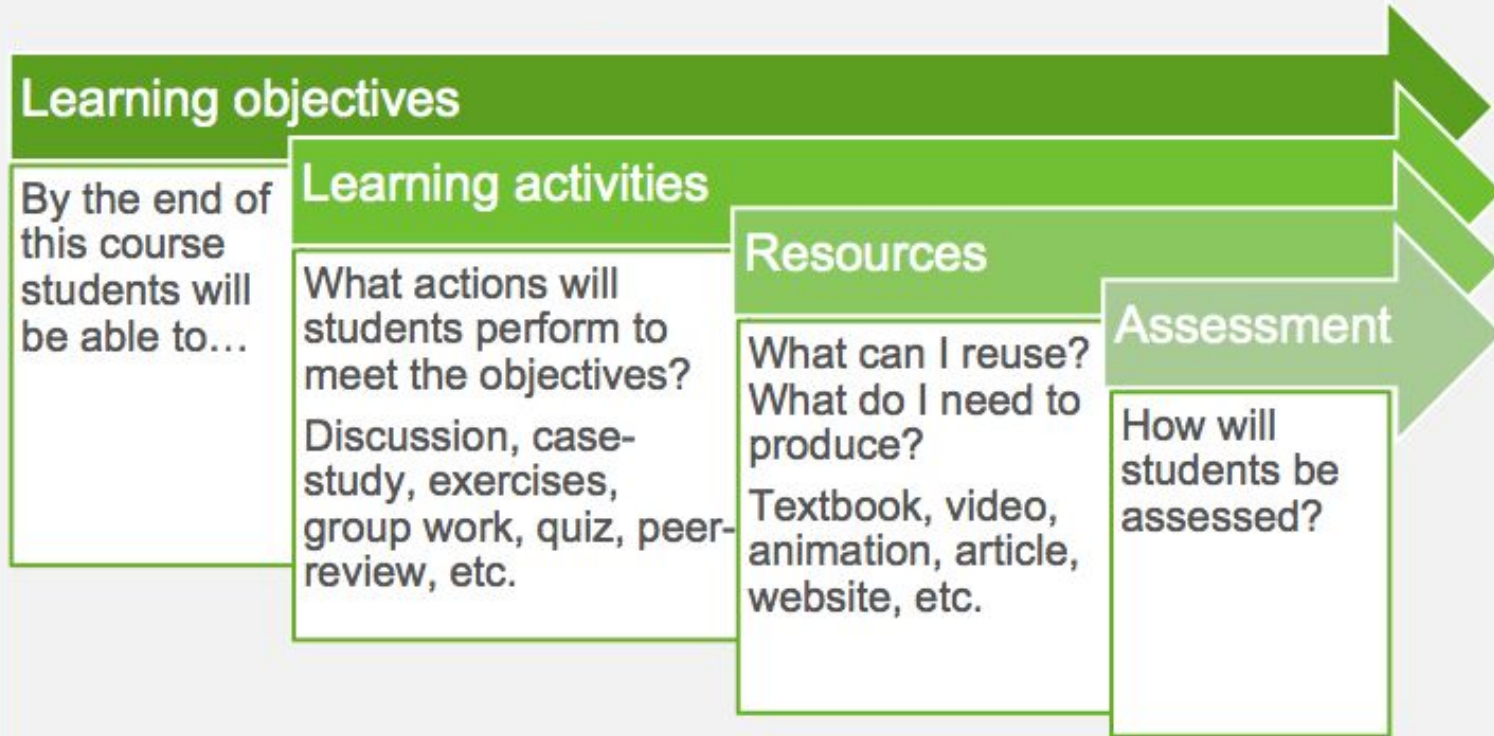
What are the most important costs in developing this activity?

## Assessment

How are the outcomes of this activity assessed?  
How will the overall experience be evaluated?



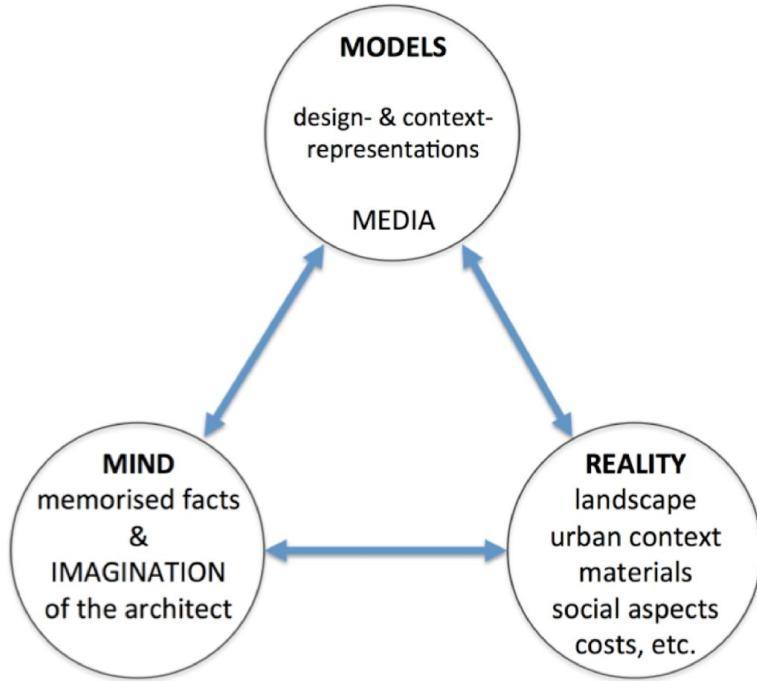
# Constructive alignment



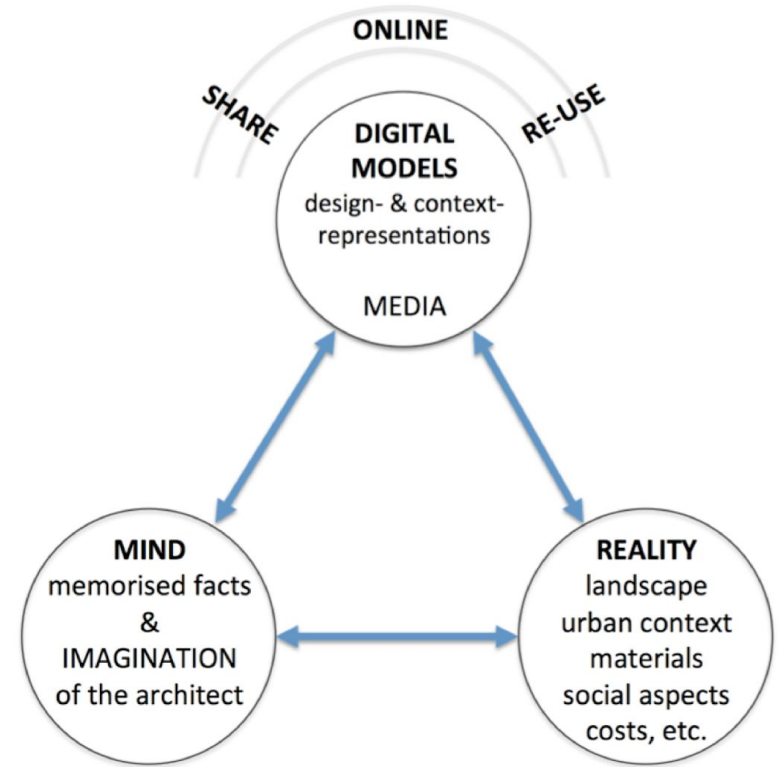
## Creating a course :

- Learning objectives
- Assessment
- Activities





**MULTI MEDIA**



**DIGITAL DESIGN**

ONLINE  
SHARE RE-USE

**VIRTUAL REALITY MODELS**  
design- & context-  
representations  
MEDIA

**MIND**  
memorised facts  
&  
IMAGINATION  
of the architect

**REALITY**  
landscape  
urban context  
materials  
social aspects  
costs, etc.

# VIRTUAL REALITY

**VIRTUAL REALITY MODELS**  
design- & context-  
representations  
MEDIA

**MIND**  
memorised facts  
&  
IMAGINATION  
of the architect

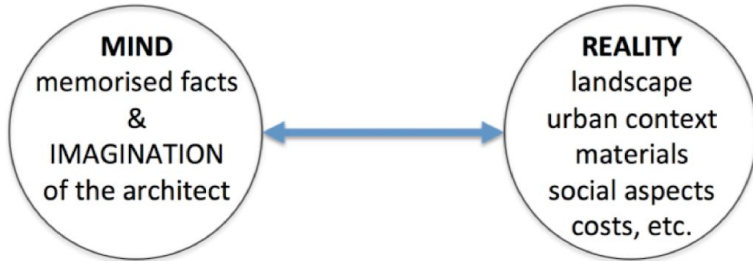
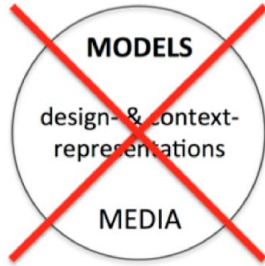
**REALITY**  
landscape  
urban context  
materials  
social aspects  
costs, etc.

# MIXED REALITY

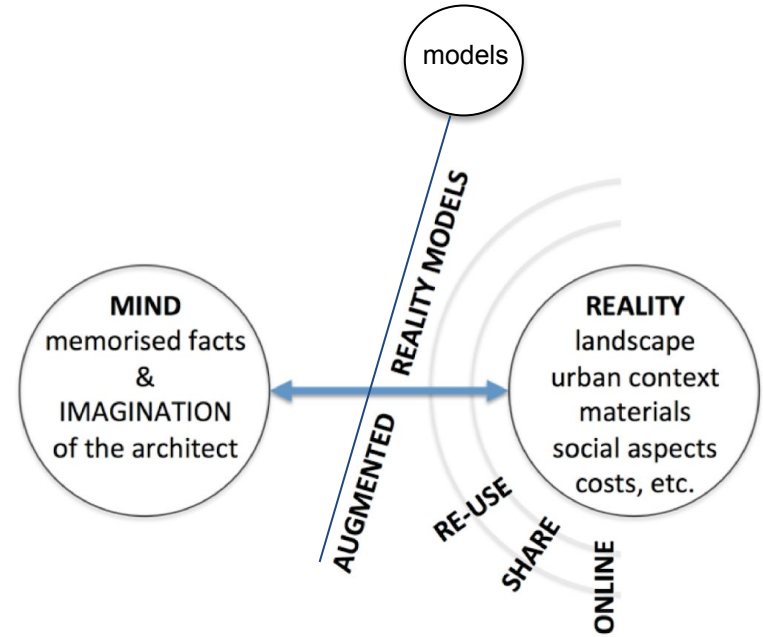
STUDIO  
MIXED REALITY

PRESENTER  
REAL OBJECTS





**FULL REALITY** (*mindfulness*)



**AUGMENTED REALITY**

# Activity for you

Relate the different levels of Bloom's Taxonomy to VR/AR/MR

**For example:**

the learner is able to *apply*  
the comments from the Mixed Reality  
feedback video  
in their own peer reviews



# Models "Tagspatial101x"



Beach Club  
by igorbul101x



House 1  
by [unreadable]



Cat Park & Dream House 01  
by [unreadable]



[unreadable] for attempt 1.



Dream House Model 01  
by [unreadable]



Dream House Model 02  
by [unreadable]



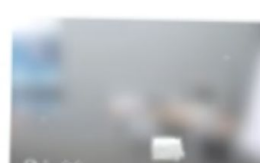
Model House 01  
by [unreadable]



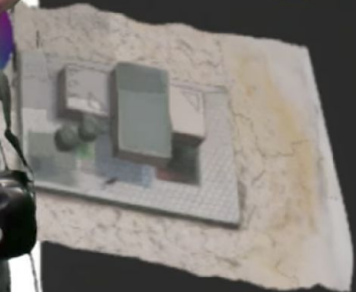
The 10 model of my dream house  
by [unreadable]

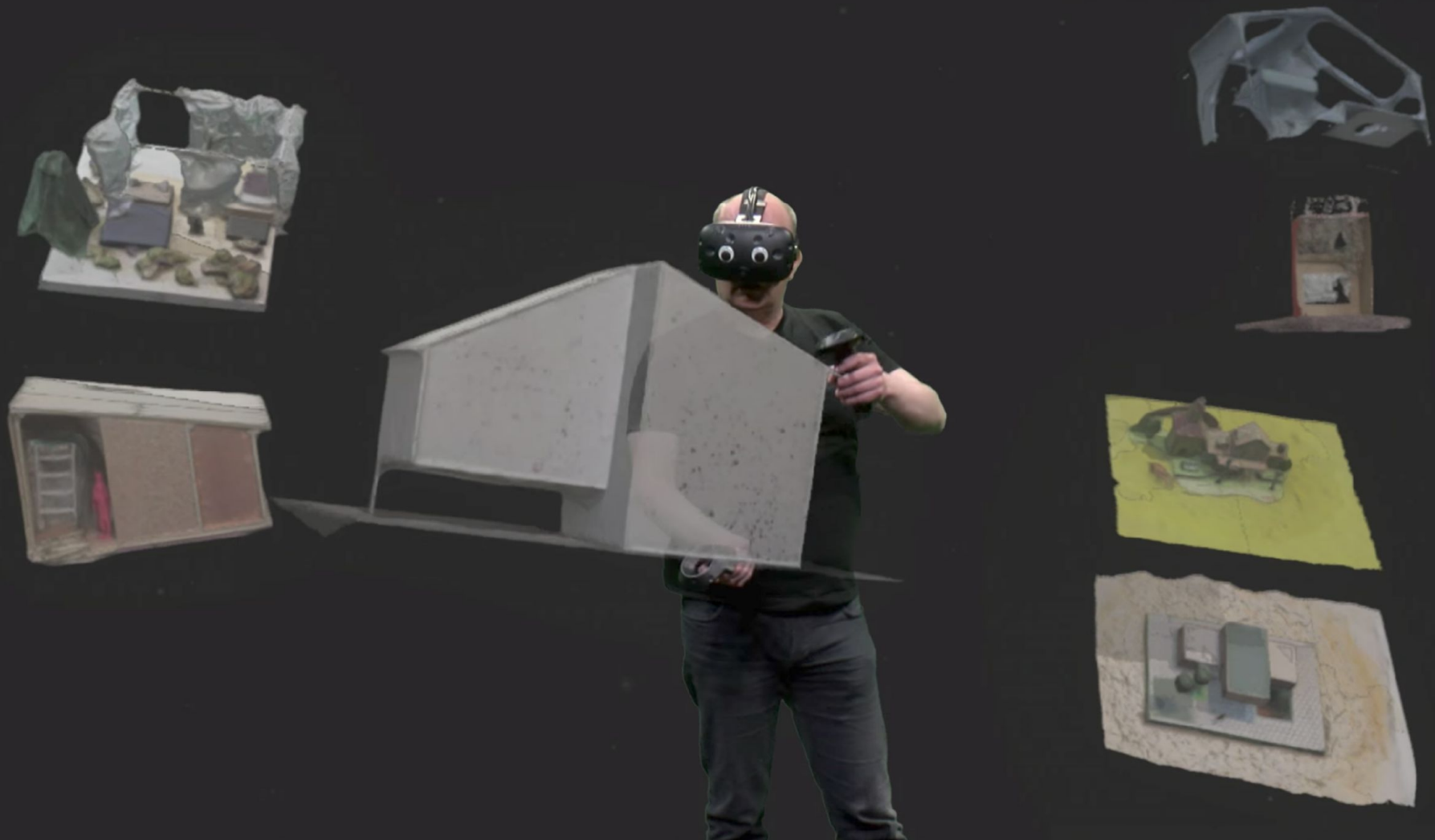


5 House Bathrooms  
by [unreadable]



Dream House 4  
by [unreadable]







# Activity for you

Relate the different levels of Bloom's Taxonomy to VR/AR/MR

## For example:

the learner is able to *apply*  
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feedback video  
in their own peer reviews



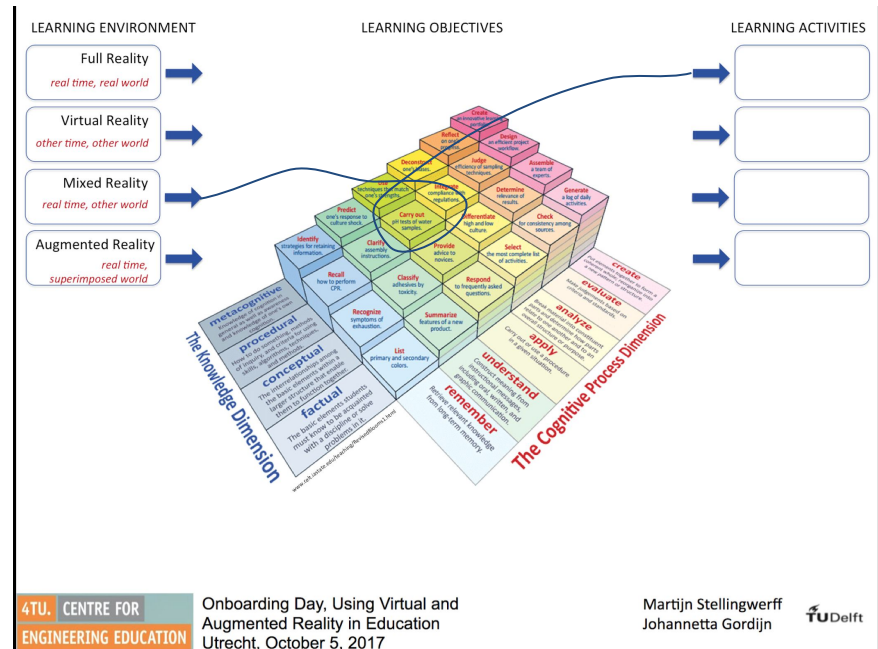


# Activity for you

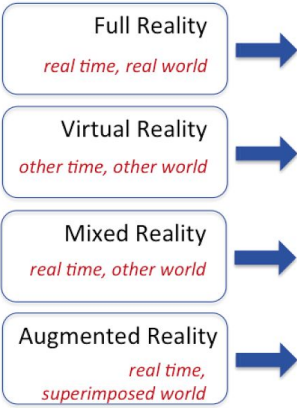
Relate the different levels of Bloom's Taxonomy to VR/AR/MR

**For example:**

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 in their own peer reviews



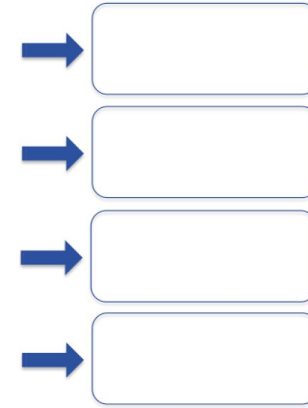
## LEARNING ENVIRONMENT



## LEARNING OBJECTIVES



## LEARNING ACTIVITIES



## LEARNING ENVIRONMENT

- Full Reality  
*real time, real world* →
- Virtual Reality  
*other time, other world* →
- Mixed Reality  
*real time, other world* →
- Augmented Reality  
*real time, superimposed world* →

## LEARNING OBJECTIVES

# CREATE



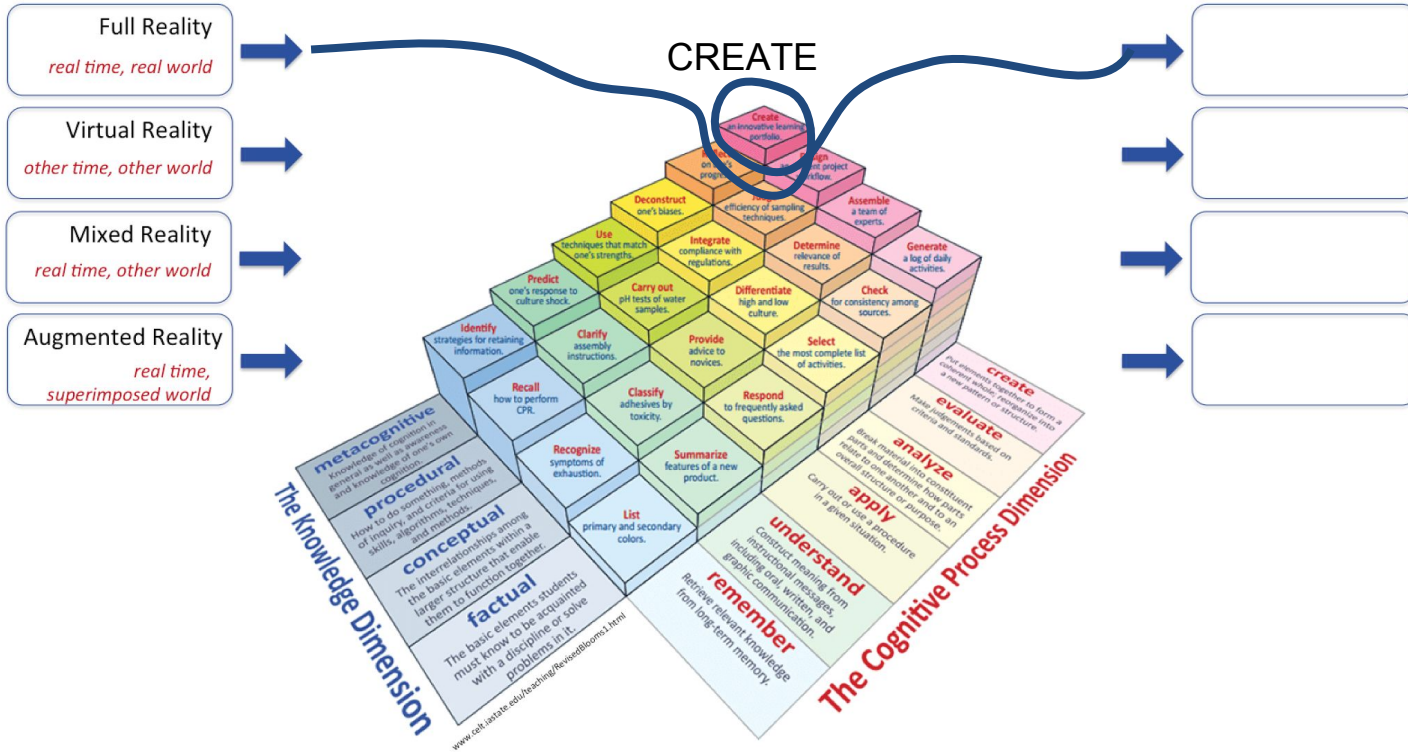
## LEARNING ACTIVITIES

- 
- 
- 
-

LEARNING ENVIRONMENT

LEARNING OBJECTIVES

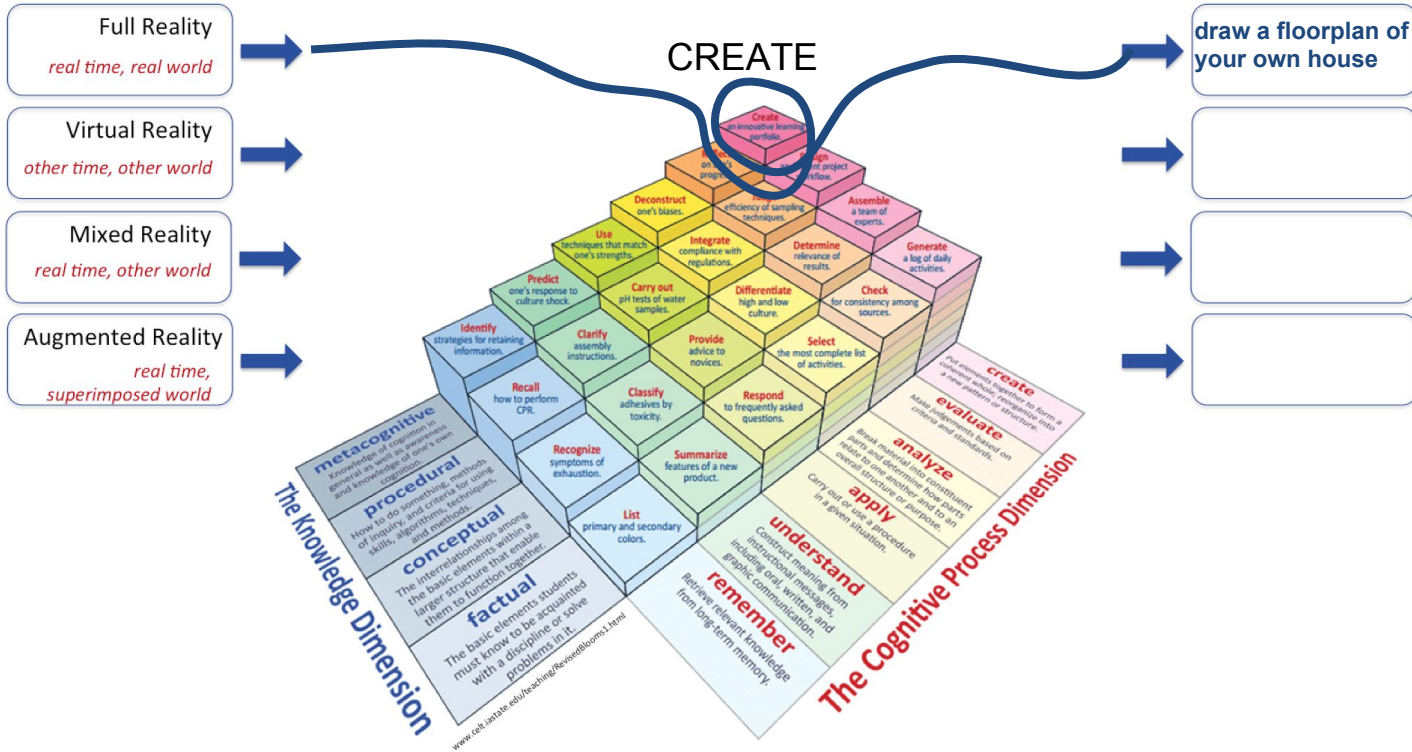
LEARNING ACTIVITIES



LEARNING ENVIRONMENT

LEARNING OBJECTIVES

LEARNING ACTIVITIES

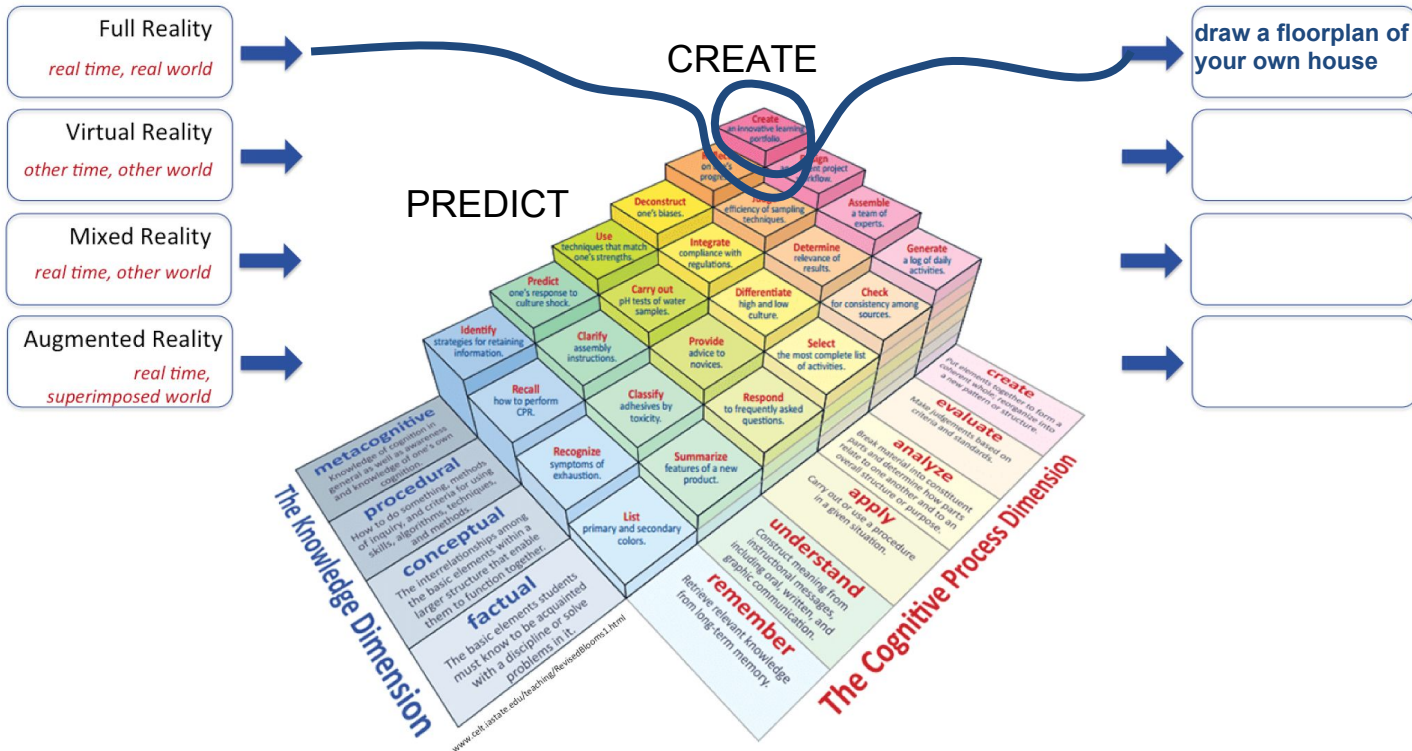




LEARNING ENVIRONMENT

LEARNING OBJECTIVES

LEARNING ACTIVITIES

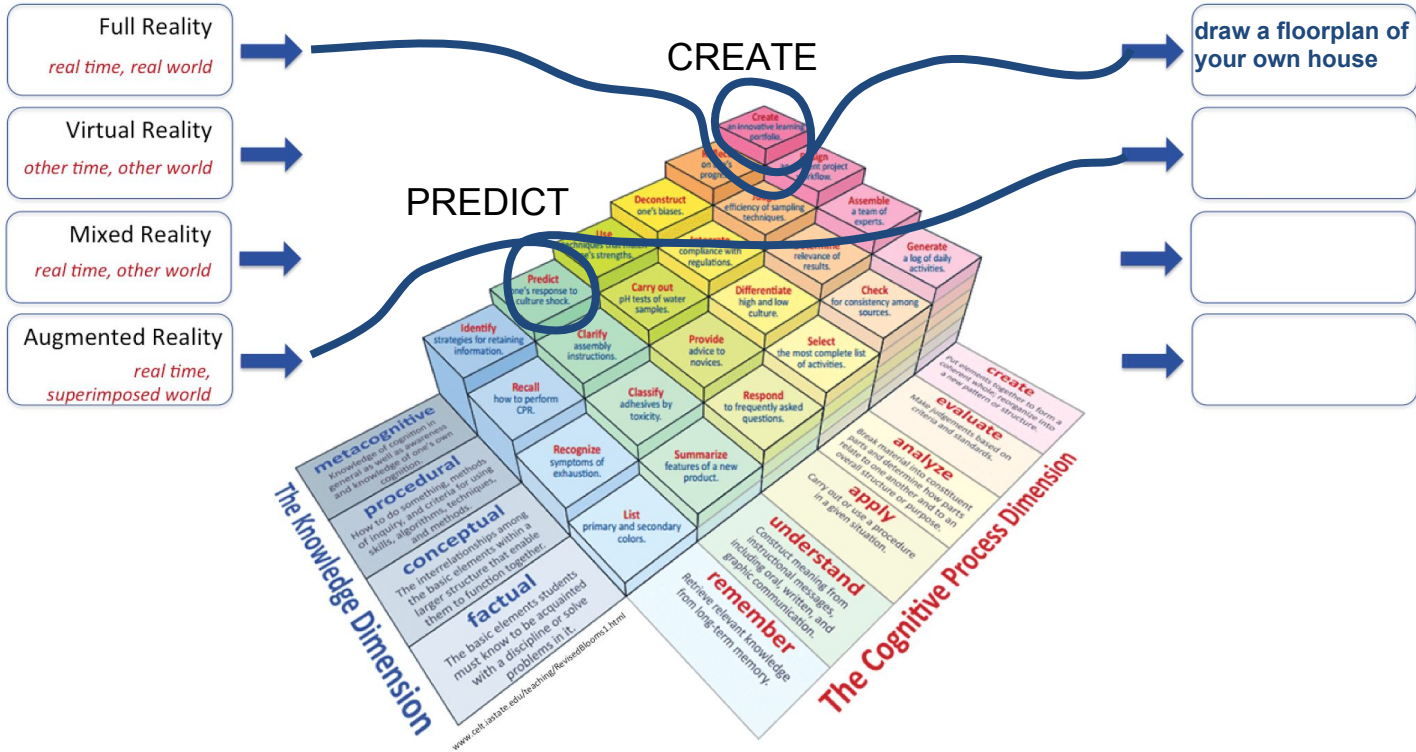




LEARNING ENVIRONMENT

LEARNING OBJECTIVES

LEARNING ACTIVITIES

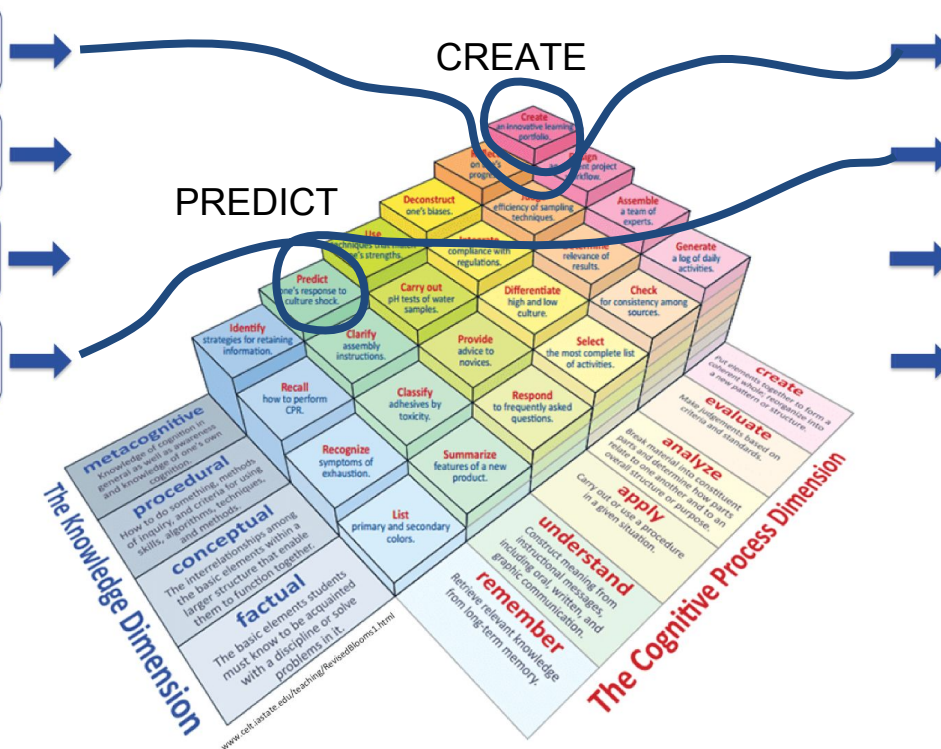


LEARNING ENVIRONMENT

LEARNING OBJECTIVES

LEARNING ACTIVITIES

- Full Reality  
*real time, real world*
- Virtual Reality  
*other time, other world*
- Mixed Reality  
*real time, other world*
- Augmented Reality  
*real time, superimposed world*



- draw a floorplan of your own house
- draw in AR where most of the (simulated) people will hide
- 
-