Hogeschool van Amsterdam
University of Applied Sciences

The Flipped Information Literacy Classroom: lessons learned

IVIG 2016 - Prague

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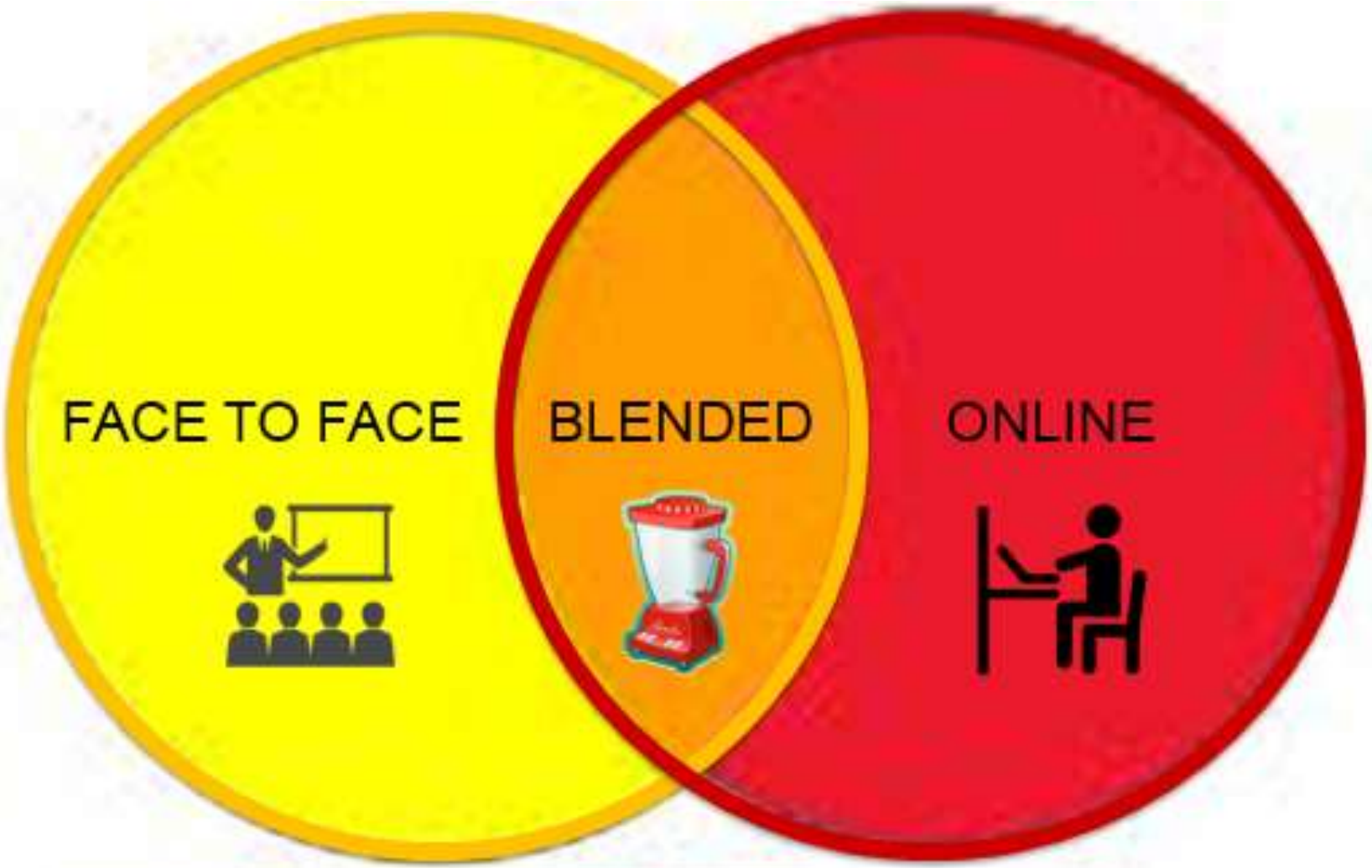
CREATING TOMORROW

Program:

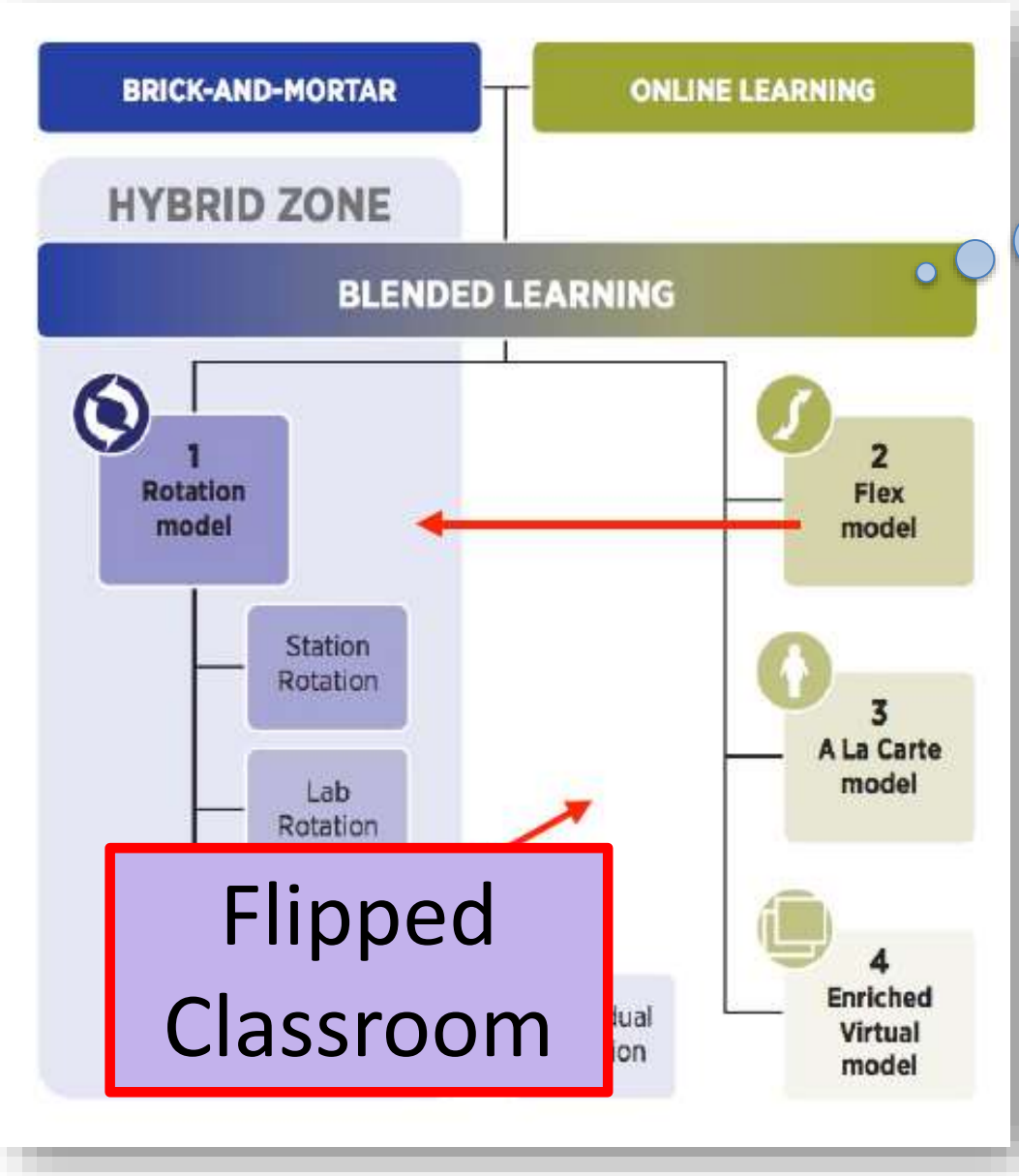
- What is Flipped Classroom?
- Why Flipped Information Literacy Classes?
- How to design Flipped Information Literacy Classes?
  - Learning Teaching Trajectories
  - TPACK model
  - Online materials at UOAS library
- Effectiveness of Flipped Classroom: research
- Opportunities and limitations for libraries: our experiences so far

What is flipped classroom?

Learning methods



Blended Learning models (Clayton Christensen)



A combination of online and face to face learning

Students among about the ratio between learning modalities online or face to face

(online learning, small group instruction, assignments, class discussions etc.)

The way of rotation is different !

WHAT IS FLIPPED CLASSROOM?

Instead of only:

students instruct themselves before class

and practice and do social activities in class

Why Flipped Information Literacy Classes?

To be more

Effective

To be more

Efficient

To be more

Interesting

To be more

Effective

Is it more effective?

$\Rightarrow$ AUAS research

To be more

Efficient

Why more efficient?

- Many students, limited amount of instructors
- The way we work (for effectivity reasons)

Workshops instead of lectures

Embedded within research skills

Embedded within projects

Multiple learning moments

Is it more efficient?

- Creating online materials will cost time
- Reducing duration of instructions will save time

So it depends on:

- Reusability of online materials
- Number of instructions in which the materials can be used
- Reduction time of instructions

To be more

Interesting

To be more

Interesting

Can you make it interesting?

Important to evaluate !

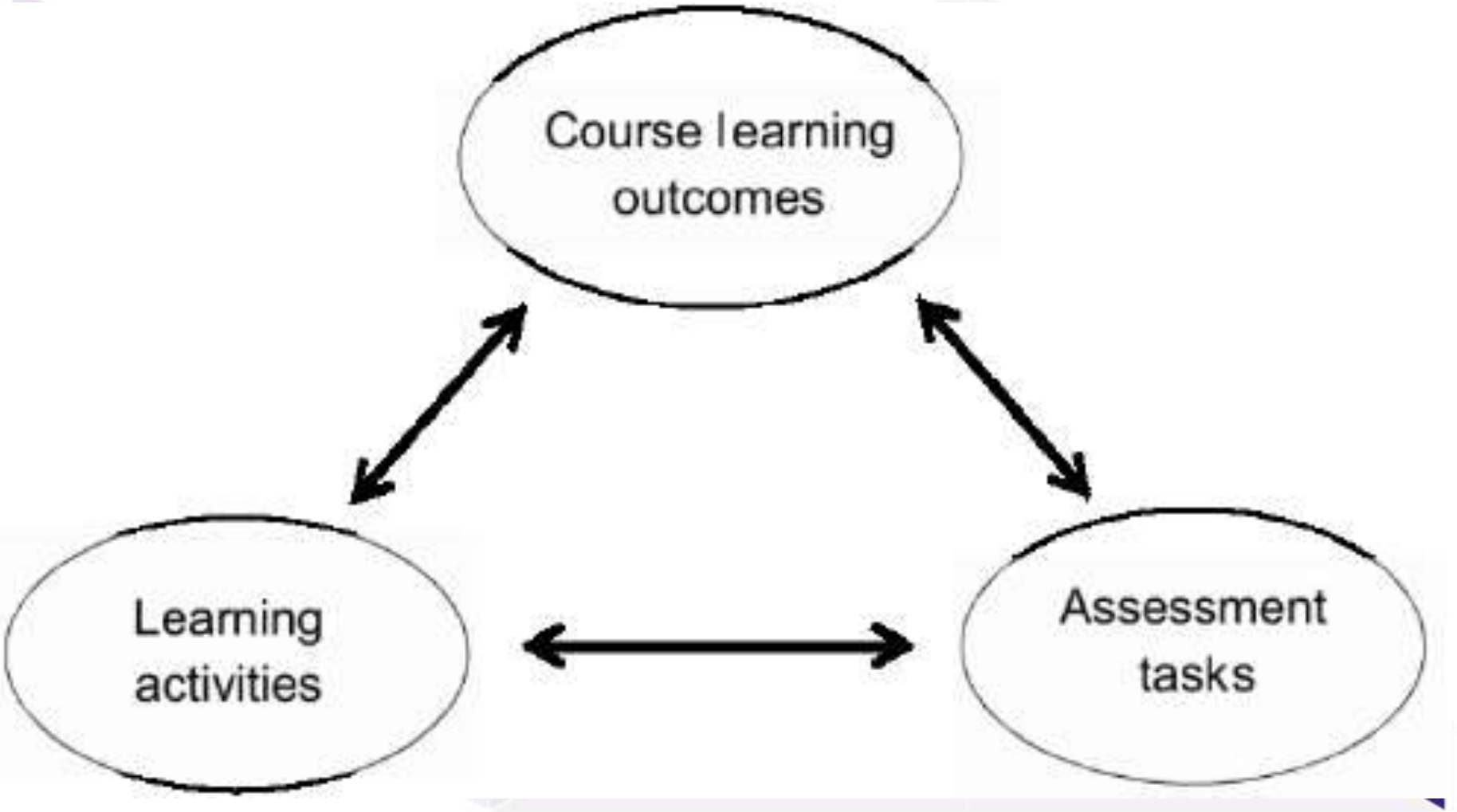
How to design Flipped Information Literacy Classes?

Learning Teaching Trajectories
TPACK model
Online materials at UOAS library

Flipped Classroom is a method of teaching not a goal in itself

It starts with instructional design

Effective teaching: Constructive alignment



Source: Biggs & Tang, 2011

Design of Flipped Classroom: 3 steps

STEP 1	**DEFINE YOUR OBJECTIVES**
STEP 2	**DETERMINE ASSESSMENT METHOD**
STEP 3	**SELECT DELIVERY METHOD / MEDIA**

Design of Flipped Classroom: 3 steps

STEP 1 **DEFINE YOUR OBJECTIVES**

- Be aware of your audience (level / preknowledge etc.)
- Align with the program
  - The project/educational program
  - The multiple learning moments of the Information Literacy program

STEP 2 **DETERMINE ASSESSMENT METHOD**

STEP 3 **SELECT DELIVERY METHOD / MEDIA**

Design of Flipped Classroom: 3 steps

STEP 1 **DEFINE YOUR OBJECTIVES**

STEP 2 **DETERMINE ASSESSMENT METHOD**

- Assessment method influences the way it can be taught and the way it can be delivered
- Notice: Assessment of information literacy mostly done implicitly by teachers (in case there is assessment)

STEP 3 **SELECT DELIVERY METHOD / MEDIA**

Design of Flipped Classroom: 3 steps

STEP 1 **DEFINE YOUR OBJECTIVES**

STEP 2 **DETERMINE ASSESSMENT METHOD**

STEP 3 **SELECT DELIVERY METHOD / MEDIA**

- What will be necessary to obtain your goal?
  - Collaboration?
  - Interaction?
  - Feedback?
  - Discussion?
  - Etc……

How to design Flipped Information Literacy Classes?

Learning Teaching Trajectories
TPACK model
Online materials at UOAS library

In order to align:

- Our different Information Literacy moments during a study period
- Our Information Literacy programs with the educational program / projects of students
- The online and face-to-face moments within a program

We increasingly describe our programs as Learning Teaching Trajectories

Definition learning-teaching trajectory

“A learning-teaching trajectory is a reasoned building of interim goals and content, leading to a final goal. Depending on precise function, context of use and target group, learning-teaching trajectories vary in the degree in which implications for different elements of the curriculum were worked out. (Strijker, 2010, p. 10).”

A good Learning-teaching trajectory

- Should have more - tuned - learning moments
- Should be integrated within the educational program
- Should build up in complexity
- Should be made explicit: write it down!

- Tip: Use Information Literacy standards

ACRL
Association of College & Research Libraries
A Division of the American Library Association

Why using a learning-teaching trajectory?

- It will make clear who is doing what in the best possible way on what moment during the study period F.E.:
    - Which parts will be done by librarian and teacher?
    - How will technology be integrated?
- The quality of Information Literacy education is expected to improve

etc.

Example

Leerlijn Informatievaardigheden OTM

1e jaars Propedeuse						
		Wat	**Doelstelling**	**Inhoud/Highlight** **	**Vorm**	**Wie**
Blok 1		Introductie	Uitleg van de basis mediatheekvoorzieningen	Gebruik van de mediatheek	20 min	Info spec
		HIT	Basisintroductie informatievoorziening	Toets	Zelfstudie	
Blok 2		Project-instructie/ Workshop * **Beroepsgerelateerde klachten bij bouwvakkers**	• Student leert zoekplan maken op eenvoudig niveau • Student doet eenvoudige zoekacties in databanken • Booleaanse operatoren • Student weet van bronvermelding (APA) • Student is in staat op eenvoudig niveau gebruik te maken van streaming media	• Basisstappen in zoekproces • verzamelen van kennis • kennis delen • multi media • Eenvoudige zoekopdracht in de databanken AI, Academia, BSL, DocOnline en PiCarta	2 les uur workshop (45 min pres+ 50 min opdrachten)	Info spec
Blok 3		Project-instructie/ Workshop * **Zoeken naar informatie: Vet Cool!**	• Formuleren van een zoekvraag volgens de PICO-methode • Tips om snel en gericht te zoeken • Uitleg twee databanken	PubMed en LexisNexis	2 uur workshop (45 min pres+ 50 min opdrachten)	Info spec
Blok 4						
2de jaars						
Blok 1		Project-instructie/ Workshop * **Zoeken naar evidence-based literatuur** PubMed	• Student leert PICO methode • Student leert te werken volgens de EBP • Student leert 1 databank grondig kennen • Schriftelijke rapportage zoekactie	• specifieke databank • selectie, kritisch lezen en evaluatie resultaten	2 uur workshop (450 min pres+ 50 min opdrachten)	Info spec
Blok 1		Project-instructie/ Workshop * **Zoeken naar**	• Student leert 1 databank grondig kennen • Schriftelijke rapportage zoekactie	• specifieke databank • selectie, kritisch lezen en evaluatie resultaten	2 uur workshop (50 min pres+	Info spec

Template Learning-Teaching Trajectory

Elements that could be described:

Year X, Semester Y

Vision (problem/wish/improvement) — What should be improved?

Learning goals — Where to? [connection to IL standards]

Content — What do they learn?

Result [product/paper etc.] — What should be delivered?

Teaching method — What teaching methods will be used?

Technology (in general) — How to use technology?

Level + prescience — What is the level of the target group? Which relevant prescience is demanded?

Testing — How will students be tested?

Casting student support — Who will teach? (subject librarian or teacher)

Implementation of a lesson — What will happen where and wenn?

Time (in min)	**Content** What does the student learn?	**Learning activity** What will the student do with the content? (fe. read/ watch / present etc.)	**Technology** How to use technology? (vb.YouTube, Socrative..)	**Materials/ sources** What materials or sources will be needed?	**Teaching activity** What will you do (or teacher) to support the student? (fe. present / coach / demonstrate etc.)
BEFORE					
15 min					
40 min		-			
LESSON					
13:00-13:30					
13:30 - …					
AFTER					
30 min					

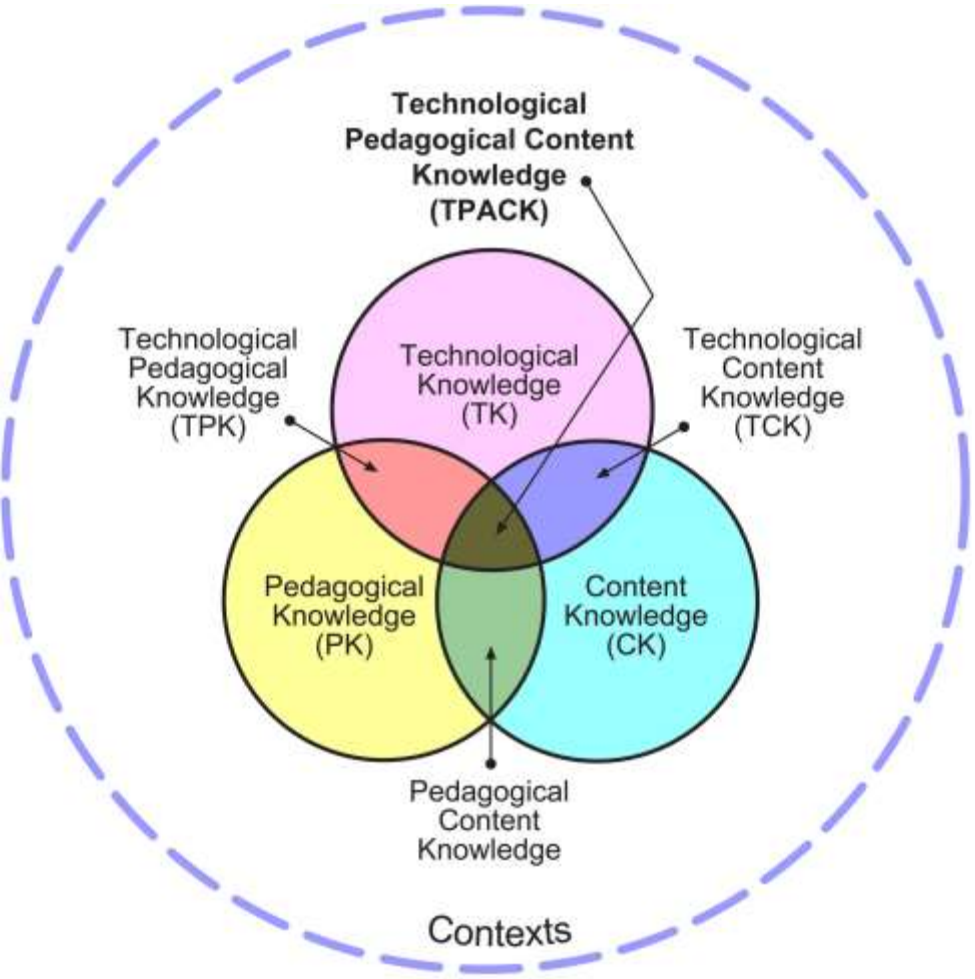
Roadmap for implementation:

STEP 1	CHECK WHAT ALREADY HAS BEEN DONE
STEP 2	CHECK THE ORGANISATION STRUCTURE OF THE SCHOOLS
STEP 3	MAKE CONTACT AND DETERMINE THE NEEDS
STEP 4	MAKE A DESIGN OF THE LEARNING-TEACHING TRAJECTORY
STEP 5	PLAN THE IMPLEMENTATION
STEP 6	EVALUATE THE LEARNING-TEACHING TRAJECTORY

How to design Flipped Information Literacy Classes?

Learning Teaching Trajectories
TPACK model
Online materials at UOAS library

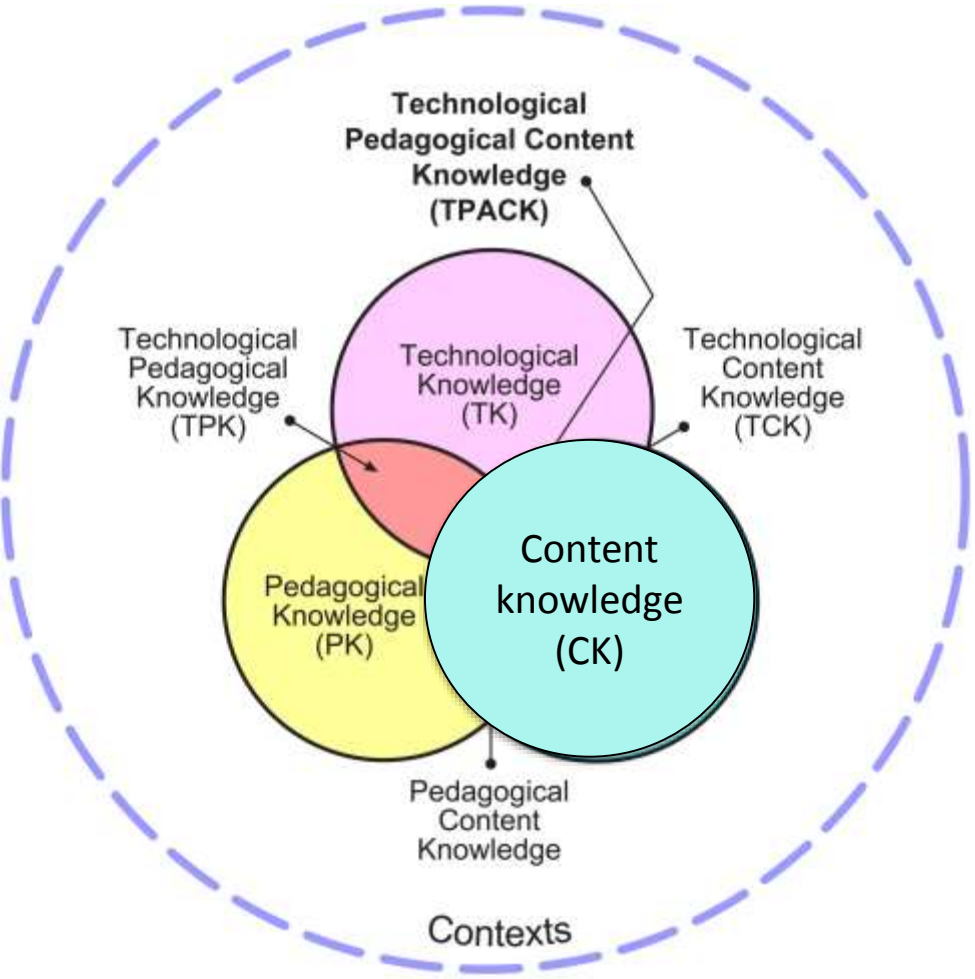
TPACK Model



<u>It's about:</u>

- Reinforcing education by technology
- Integrated knowledge of:
  - Technology
  - Pedagogy
  - Content

TPACK Model: content knowledge



- Knowledge of a subject area

mathematics

biology

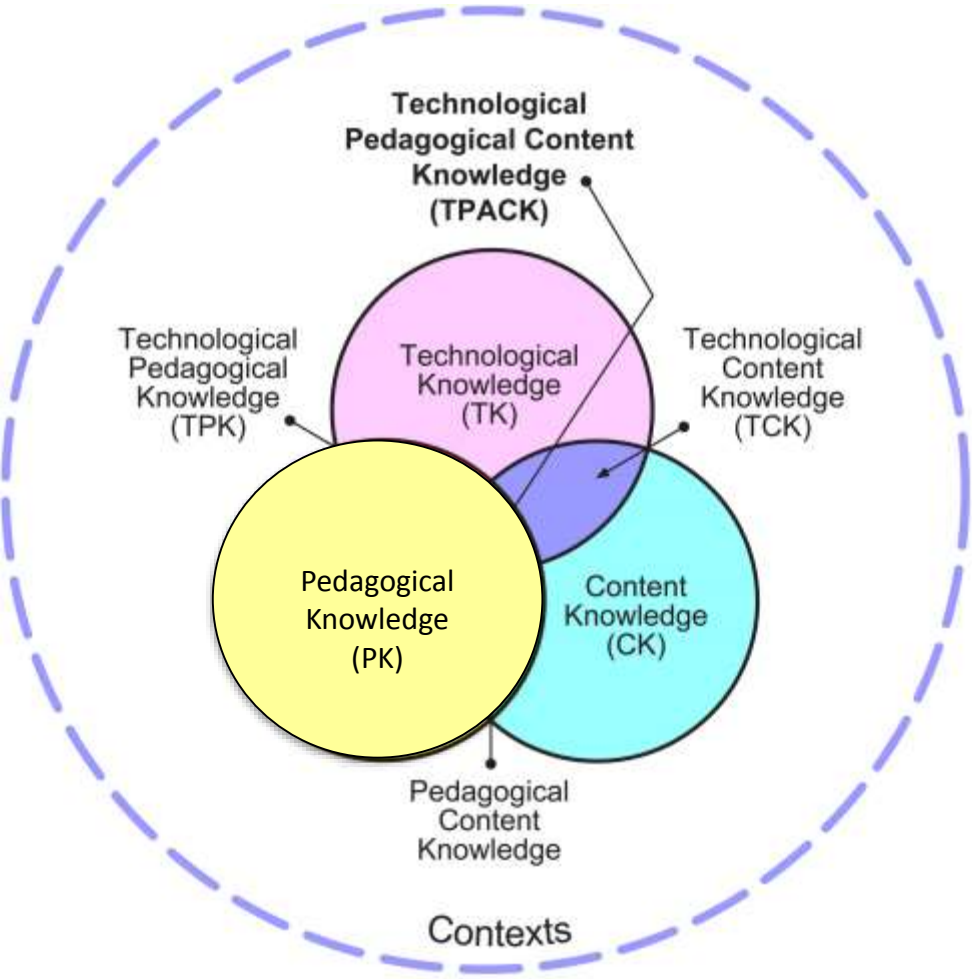
history

Etc.

Information literacy

- Concepts, theories, skills, procedures etc.

TPACK Model: pedagogical knowledge



- methods of teaching

(transfering the knowledge)

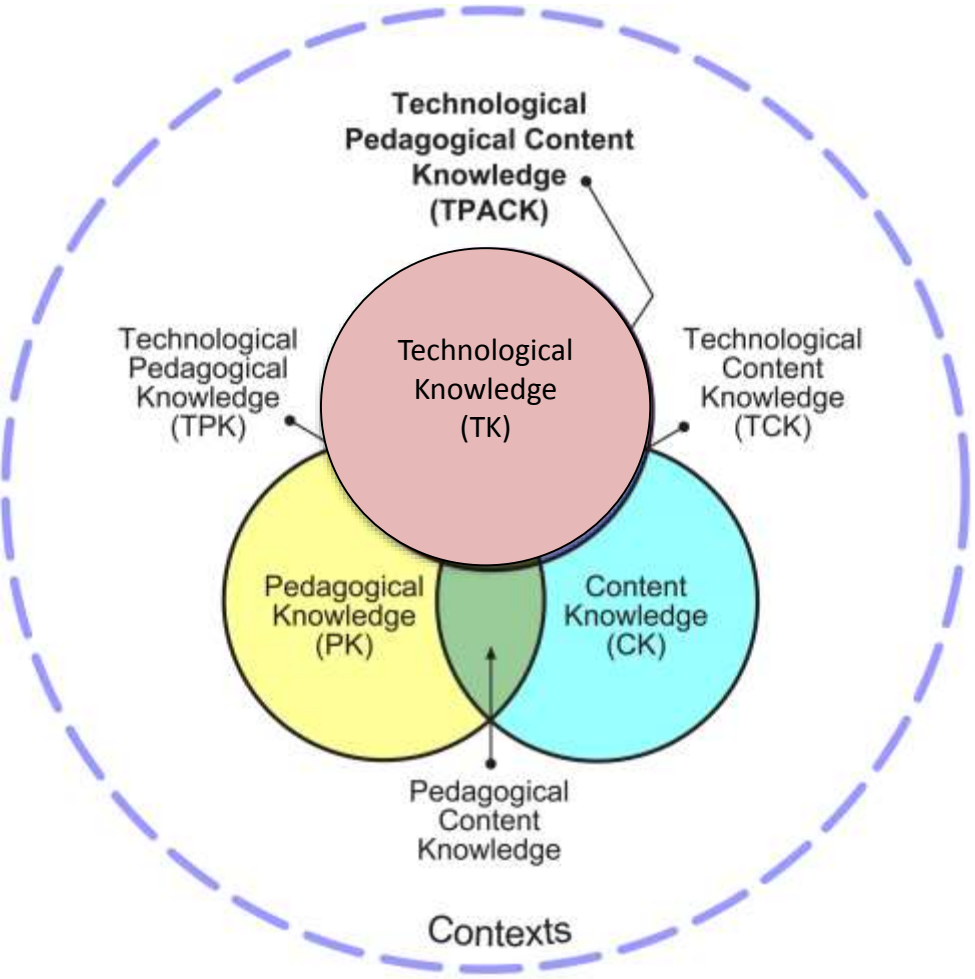
The way of
using
educational tools

Preparing lessons

Student assessment

Etc.

TPACK Model: technological knowledge



Technology must be supportive!

internet

online courses

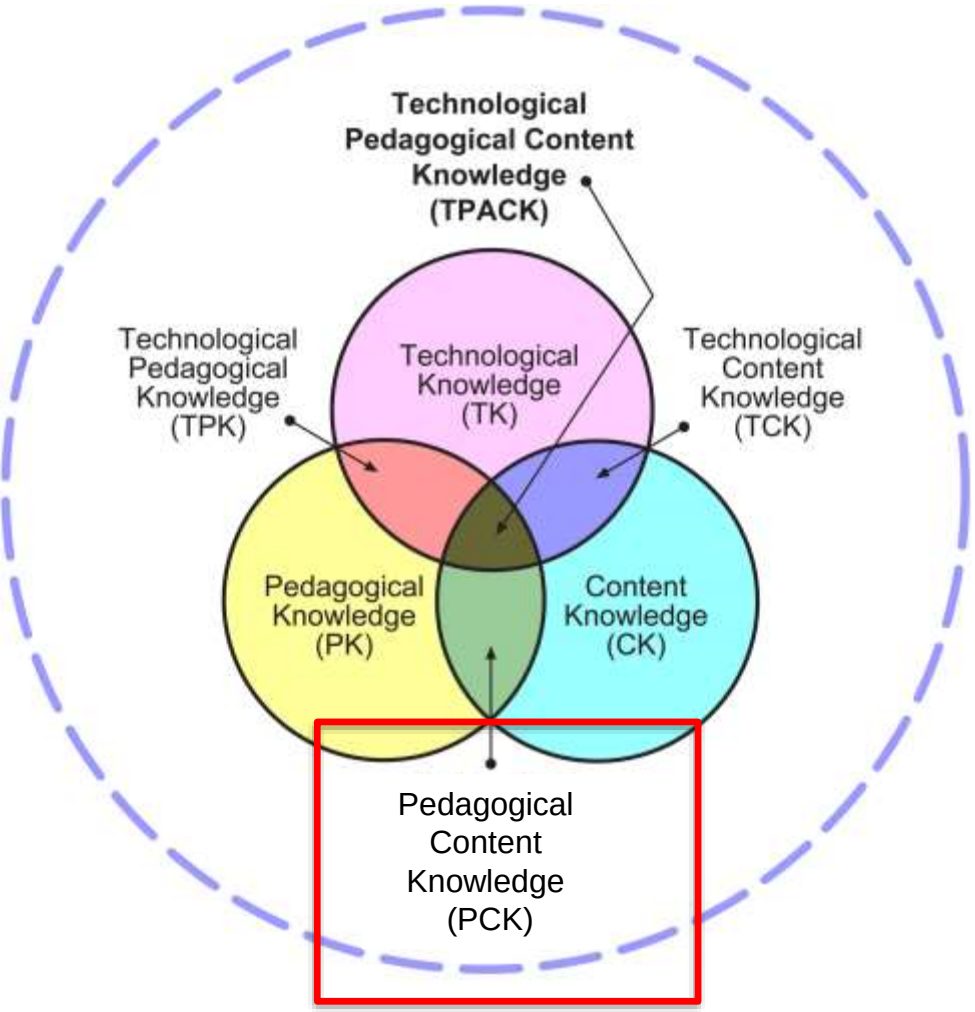
video

software appplications

school board

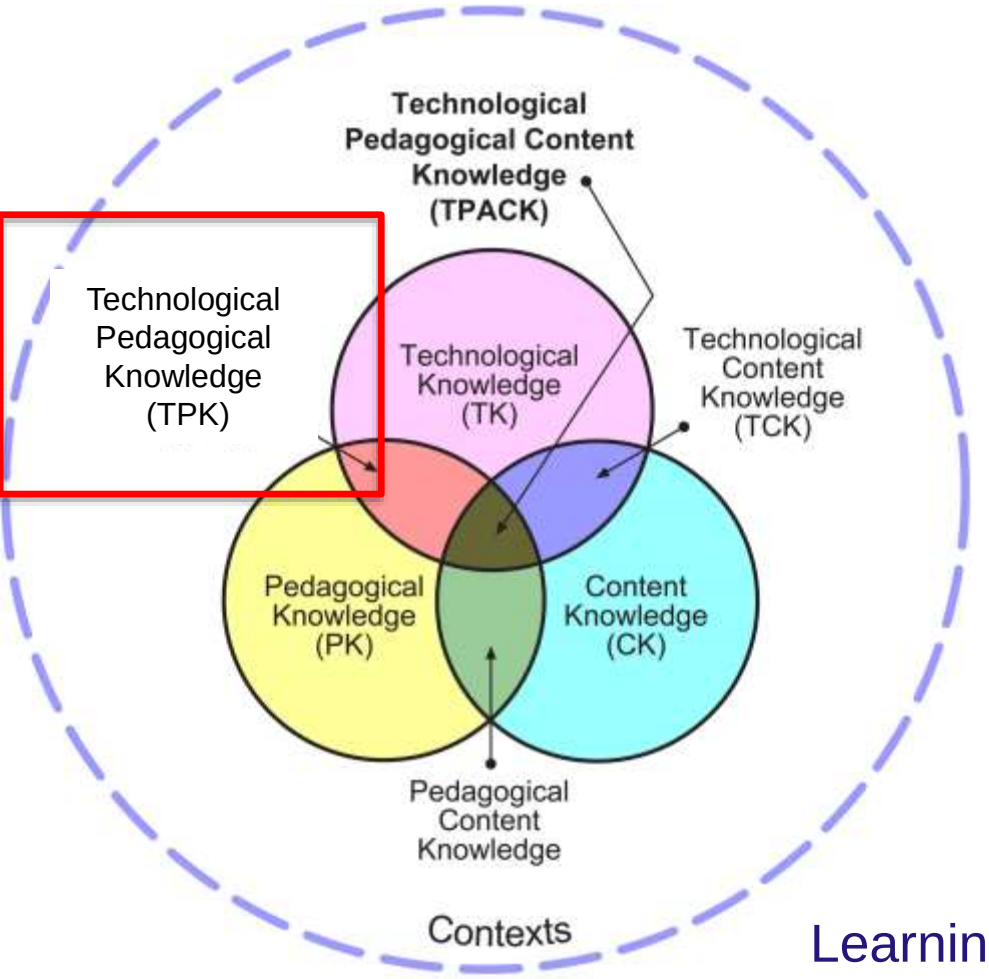
Etc.

TPACK Model: PCK



- How to teach specific content?

TPACK Model: TPK



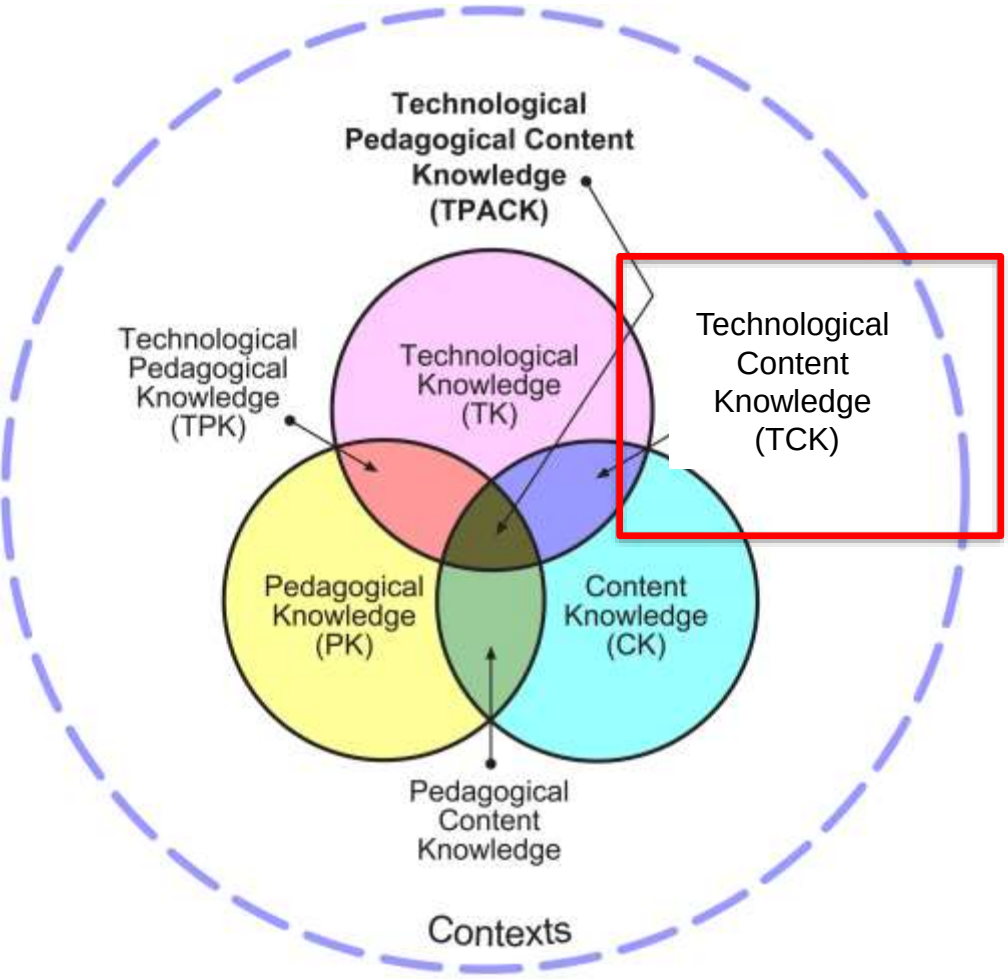
- Implementing technology, tools and media in the way you teach
- Technology ↔ Didactics

discussion boards

digitale voting

Learning analytics

TPACK Model: TCK



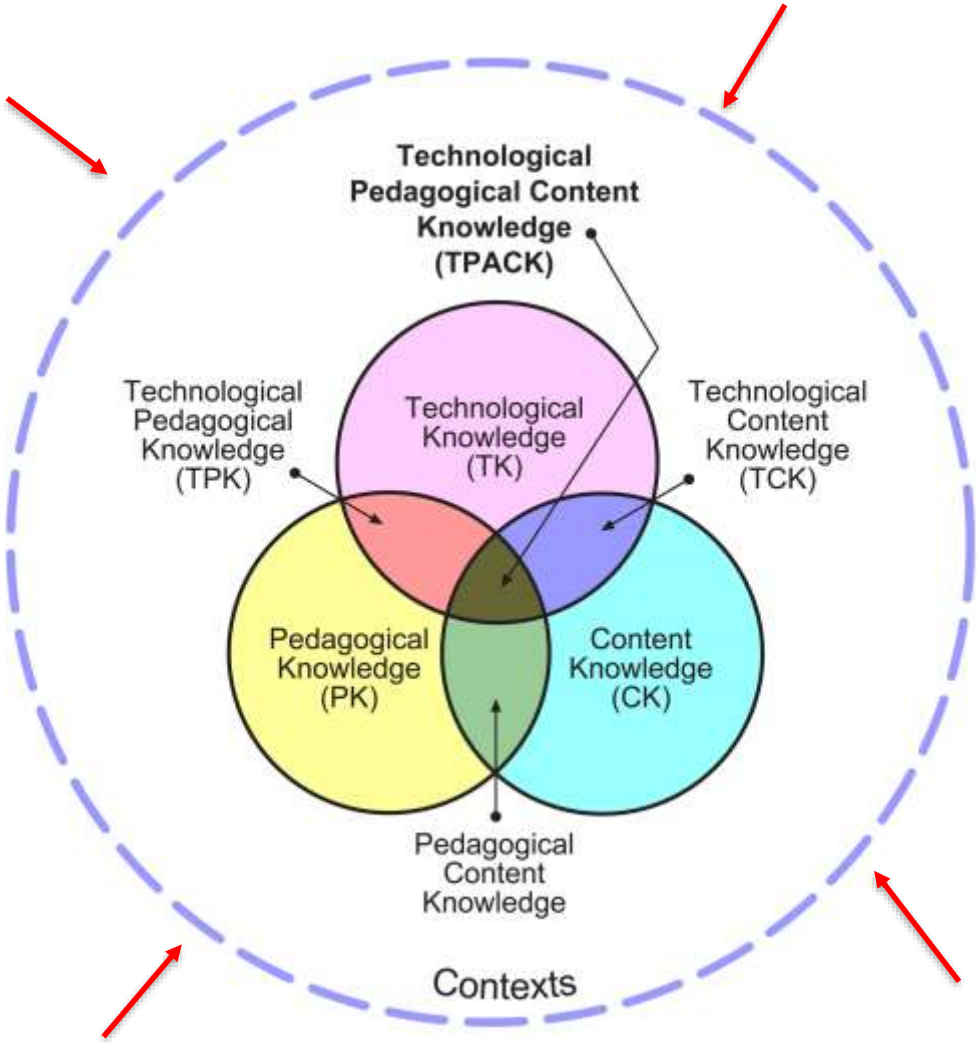
- Technology should support transfer of knowledge
- Technology ↔ Content

e.g. Information Literacy [→]
Card indexes → database search

Media Studies [→]
Use of 3D printers

[←] Writing of papers
Web versus paper: different needs

TPACK Model: TCK



= context circle

Be aware of:

e.g. Target group

School / organisation

Infrastructure

Surrounding

TPACK learning journey map

TITLE:

FOREKNOWLEDGE

	BEFORE THE CLASS	DURING THE CLASS	DURING THE CLASS	DURING THE CLASS	AFTER CLASS
 **TIME FRAME** WHAT HAPPENS AT WHAT STAGE?					
 **CONTENT OR ISSUE** WHAT CONTENT WILL BE DISCUSSED?					
 **LEARNING ACTIVITIES** WHAT WILL THE STUDENT DO WITH THE CONTENT?					
 **TECHNOLOGY** HOW TO USE WHICH TECHNOLOGY?					
 **TOOLBOX** WHICH MATERIALS AND SOURCES DO YOU USE? HTTP://TOOLBOX-EN.FONTYSDIENSTOENO.NL/					
 **TEACHING ACTIVITIES** WHAT DO YOU DO TO SUPPORT LEARNING ACTIVITIES OF YOUR STUDENTS?					

How to design Flipped Information Literacy Classes?

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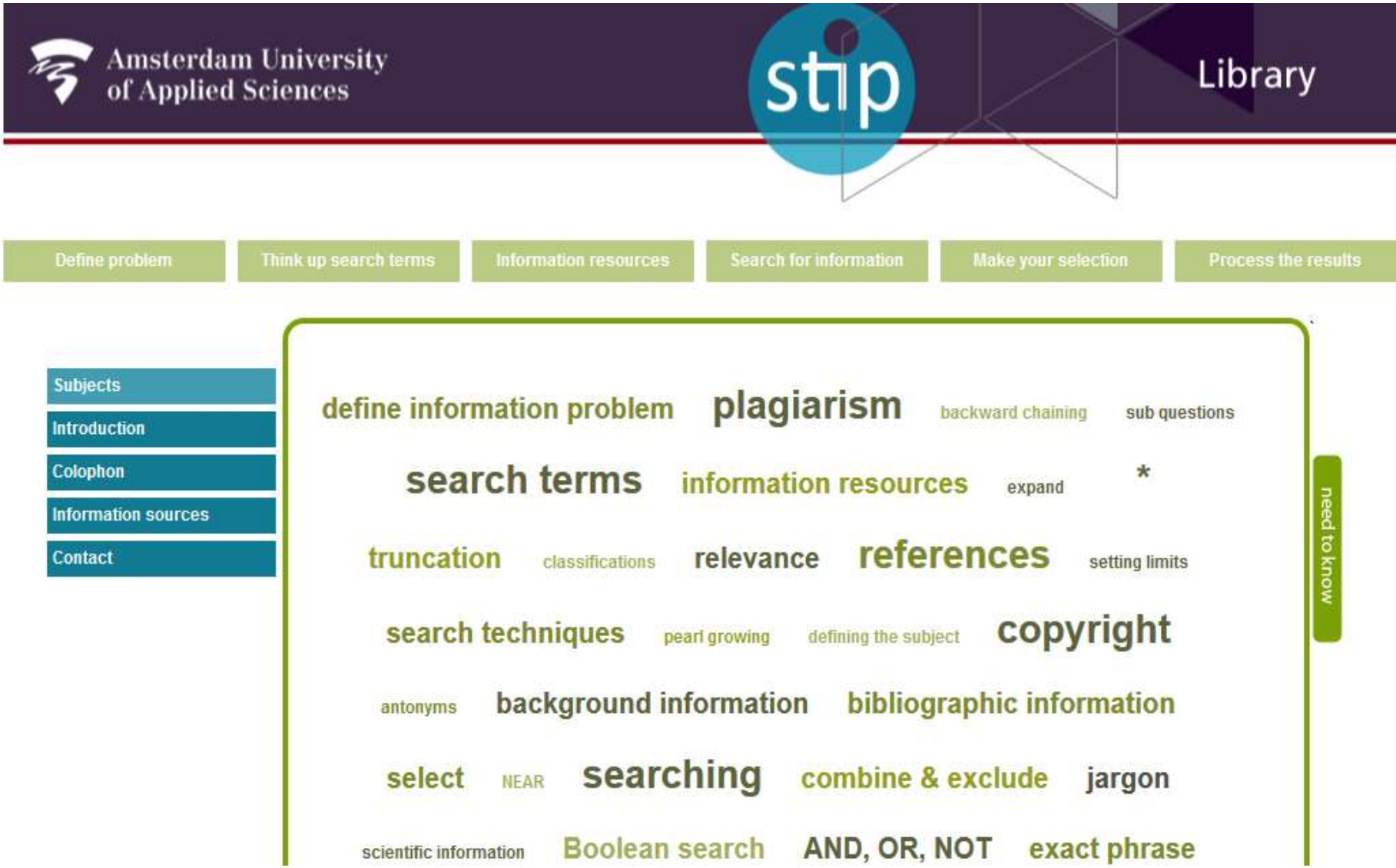
Online course (link)



29 Student to student video's (link)

Link Vimeo

Captivate module (link)

Hogeschool van Amsterdam

Workshop Informatievaardigheid

Faculteit Business en Economie

CE - Digitale Marketing Jaar 2

September 2016

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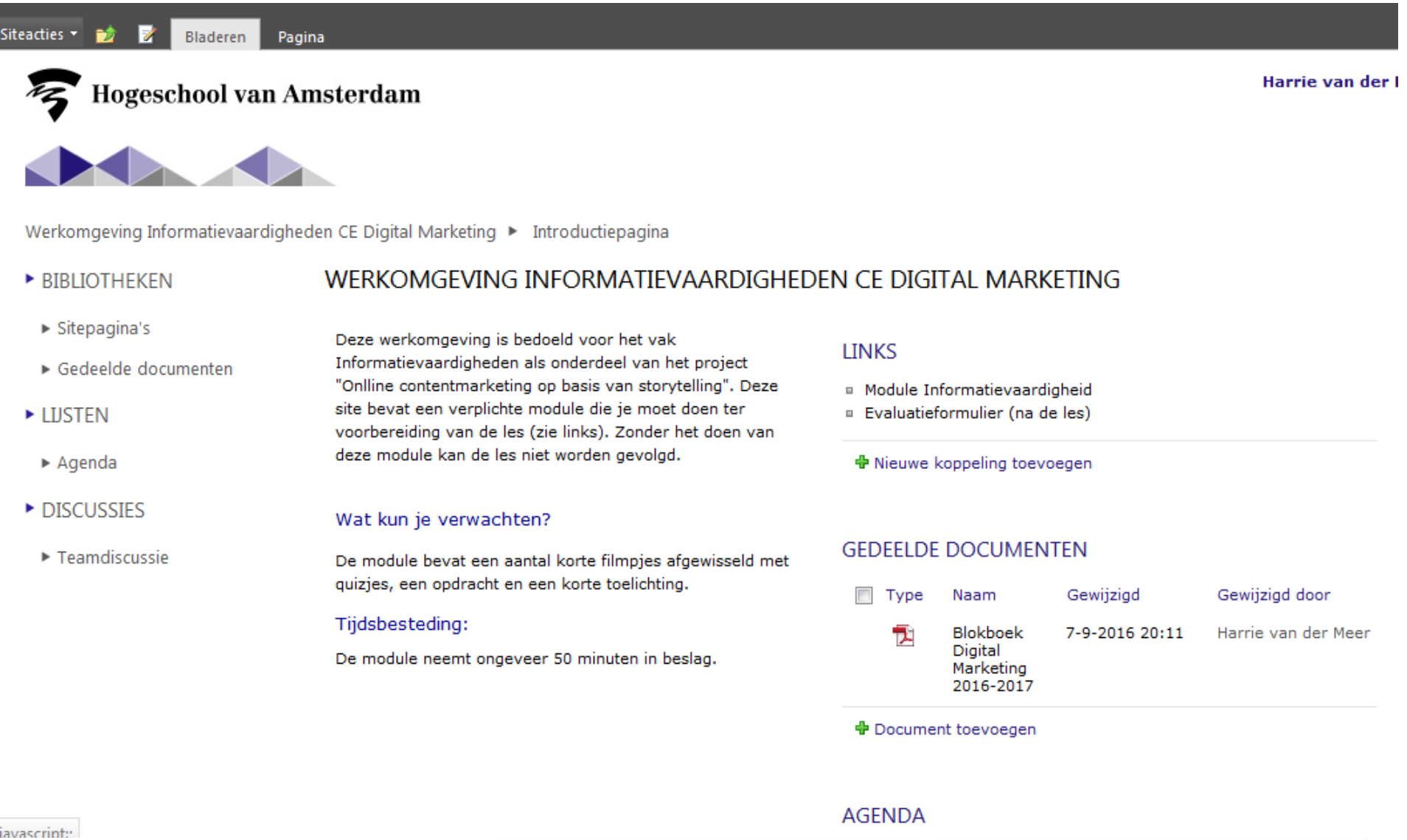
Different ways of using online content

Preparation student	Workshop
5 videos (15 min)	Quiz at the start
	Short summary of theory
	Practising and coaching

Preparation student	Workshop
Online IL course (45 min)	Exercises
Videos (15 min)	Screencasts with the answers
Test (15 min)	(during and after the workshop)

Preparation student	Workshop
Captivate module (45 min)	Discussion
(with assignment to fill in logbook)	Exercises

Platform for delivery - mainly our LMS



Effectiveness of Flipped Classroom

Research september 2015
Research september 2016

Our goals:

To find out which method is more effective: flipped classroom or traditional workshop (within our situation)

To improve our information literacy courses

- effectiveness
- efficiency

Effectiveness of Flipped Classroom

Research september 2015

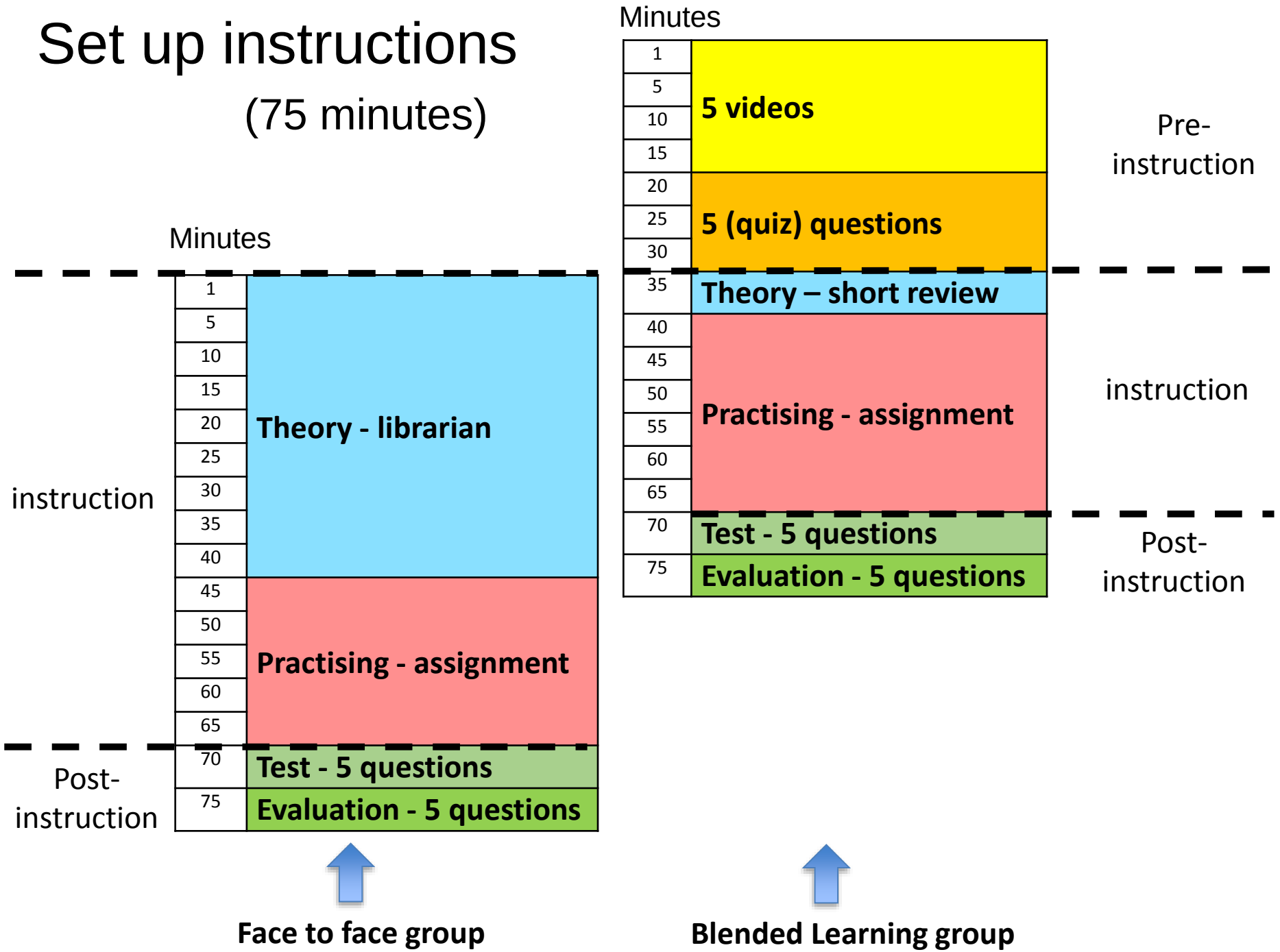
Research september 2016

Research design

- Two groups:
  - Blended Learning group (111 students)
  - Face to face group (73 students)
- Identical study load
- Effectiveness measurement of **knowledge**
- Evaluation of student perception

Set up instructions

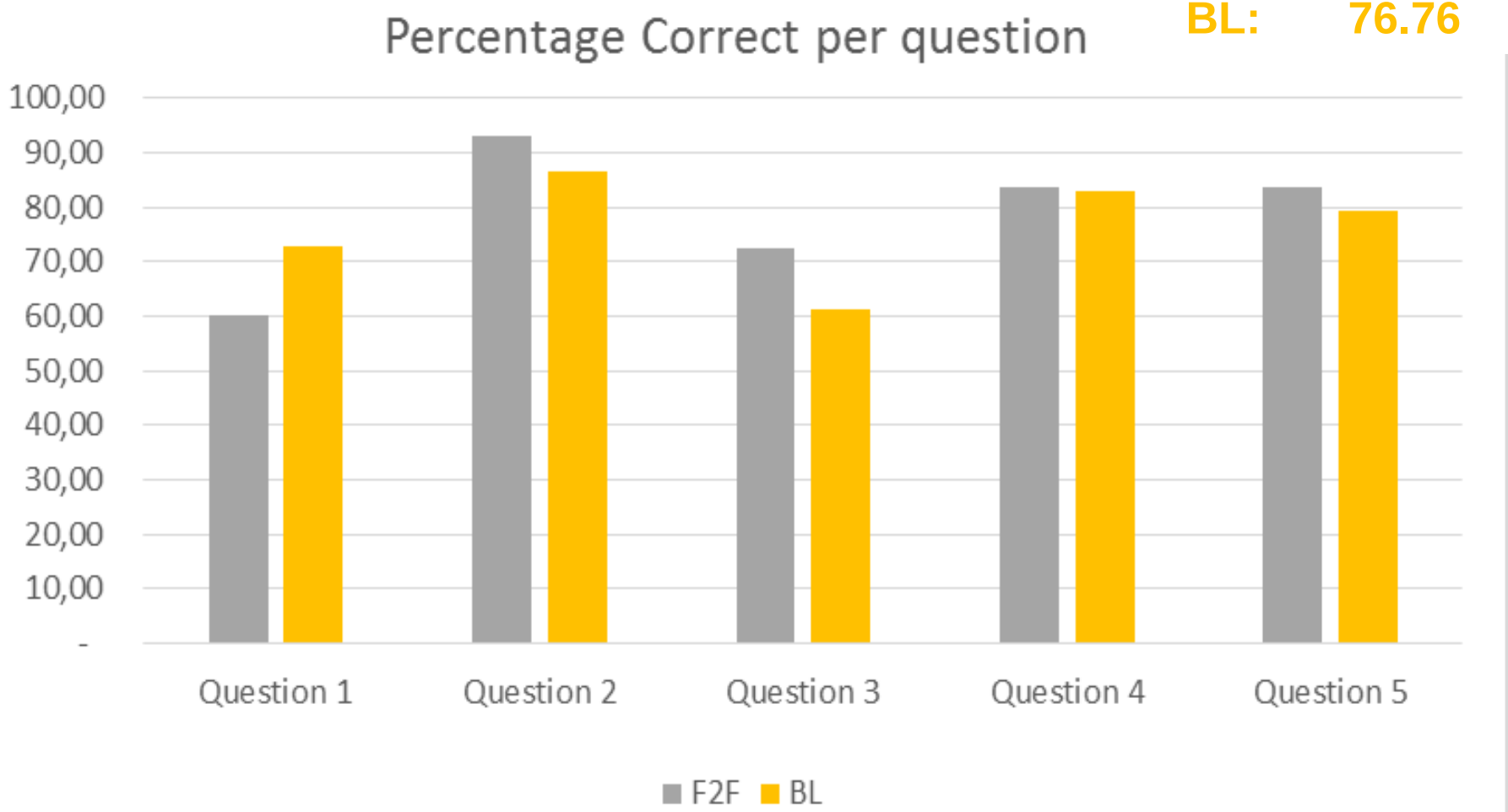
(75 minutes)



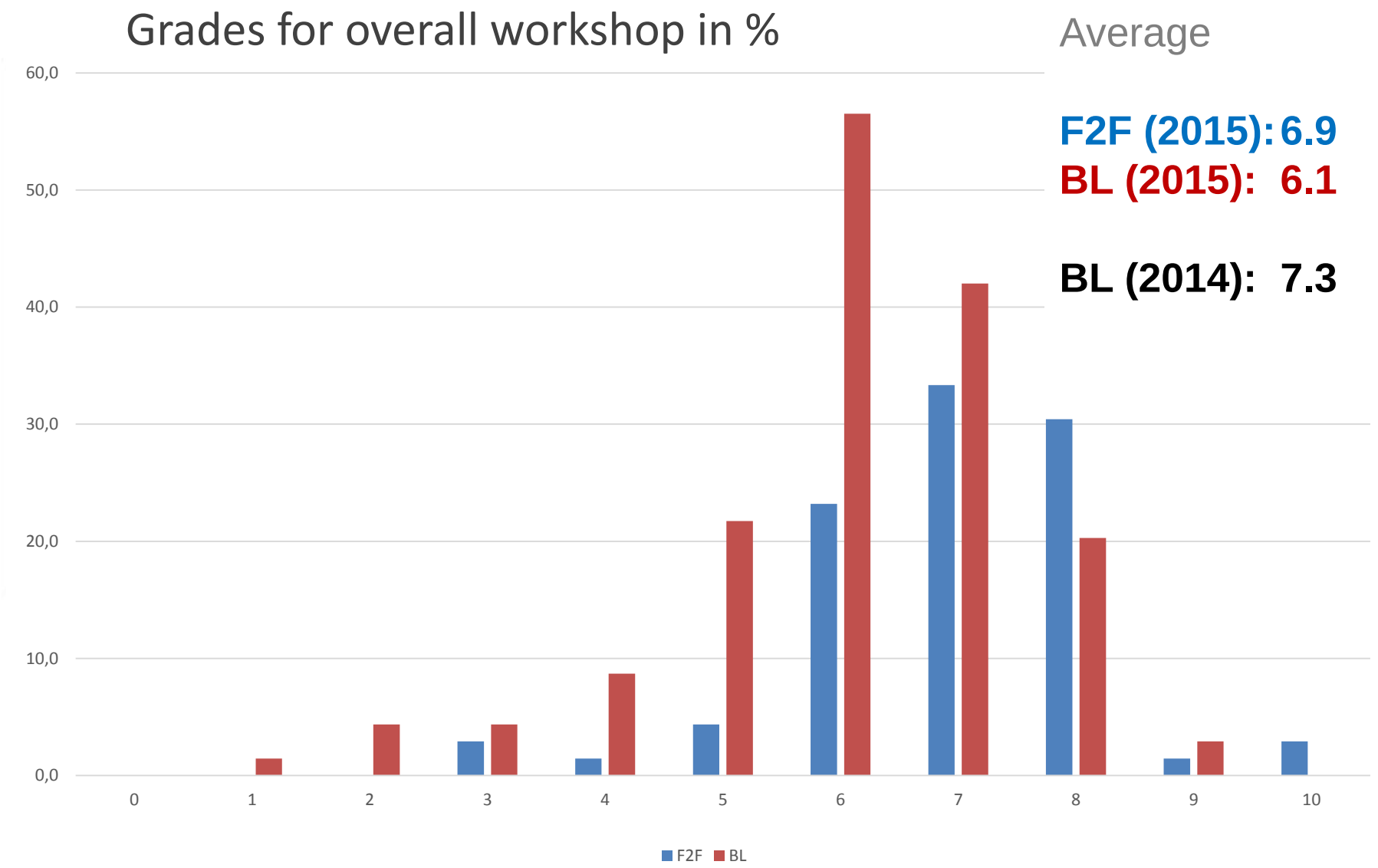
Effectiveness

Average

F2F: 78.63
BL: 76.76



Evaluation



Average

F2F (2015): 6.9

BL (2015): 6.1

BL (2014): 7.3

Conclusions research 2015

Effectiveness:

There was no difference in the overall test scores between the BL and the F2F group

Evaluation:

The evaluation of the overall workshop is significantly lower for the BL group compared with the F2F group ($P<0.01$)

Reflexion on research:

- Group sizes should be equal (that wasn't the case)
- Information Literacy is more than knowledge: skills should measured as well

Effectiveness of Flipped Classroom

Research september 2015

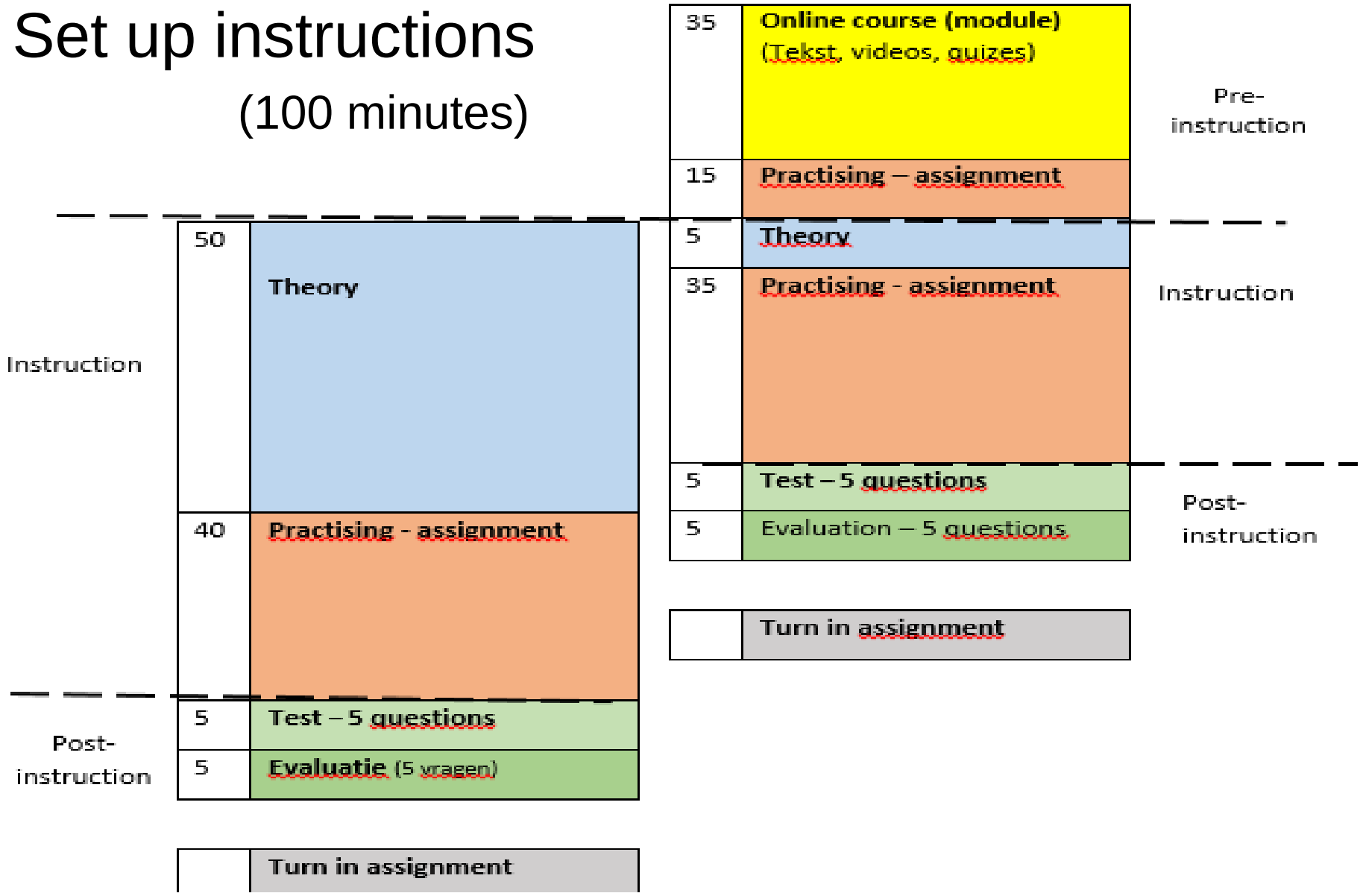
Research september 2016

Research design

- Two groups: (2x2)
  - Blended Learning group (50 students)
  - Face to face group (50 students)
- Identical study load
- Test $\Rightarrow$ effectiveness measurement of knowledge
- Scoring Rubric $\Rightarrow$ effectiveness measurement of skills
- Evaluation form $\Rightarrow$ evaluation of perception of students

Set up instructions

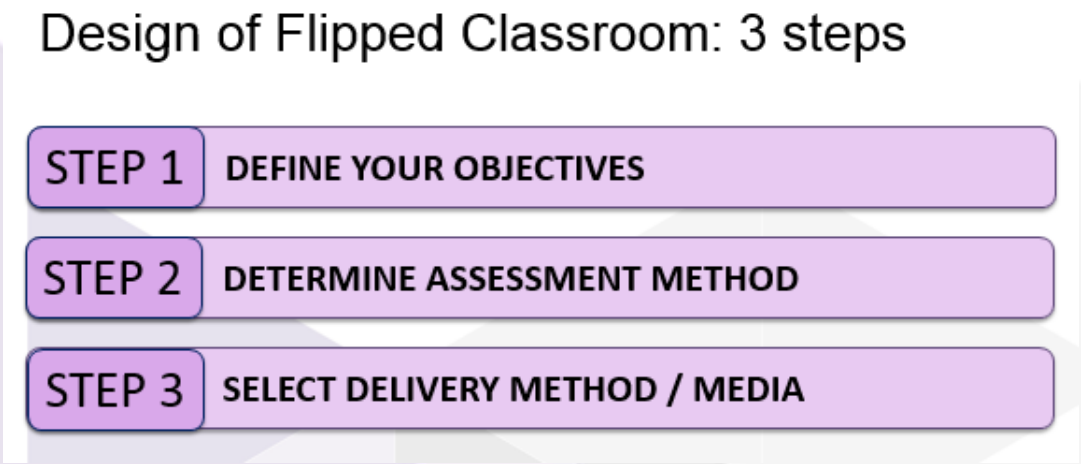
(100 minutes)



Face to face group

Blended Learning group

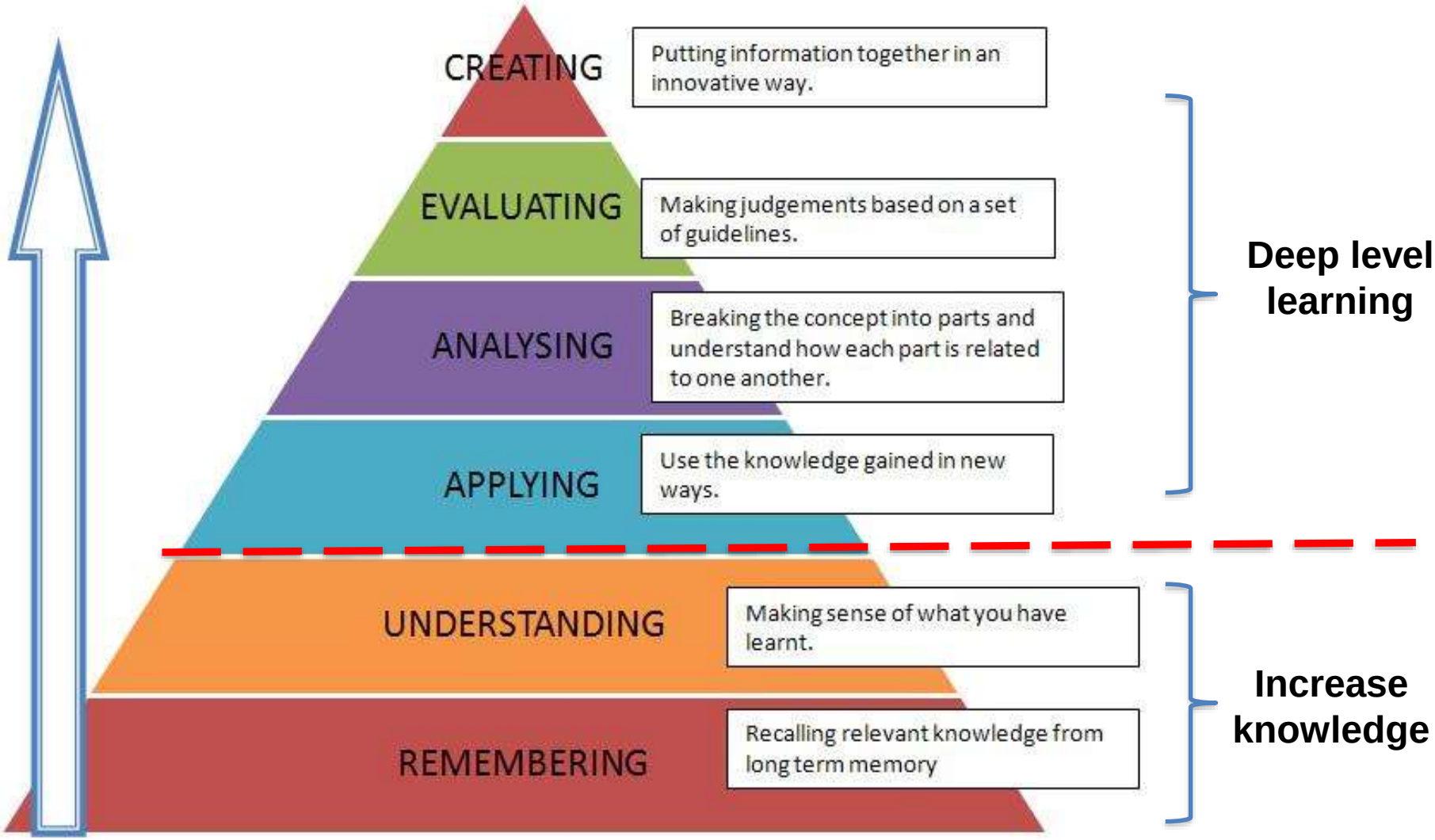
Objectives ⇒ testing and delivery method



Using:

- Information Literacy Standards (ACRL)
- Bloom's taxonomy: to decide in what way should be tested and delivered

Bloom's taxonomy



Excelsheet

Potential learning goals (objectives)	Part of program?	Taxonomy Bloom						FC: before or in class		Availability of educational materials			Ways of testing		
ACRL old + framework		R	U	Ap	An	E	C	Before	In class	Video	STIP	Not available.	Test	Rubric	Rubric+logbook
[Zoektermen bedenken] De student kan voor iedere term varianten bedenken (synoniemen, antoniemen, vertalingen, vaktermen,)	x		x					x	x	Search terms			x		x
[Zoektermen bedenken] De student is zich bewust van de mogelijkheid dat hij verschillende talen moet hanteren [STIP 1]	x		x					x		Search terms			x		
[Aard informatie] De student kan beoordelen welk type informatiebron hij moet gebruiken voor een bepaald type vraag. [STIP 1]	x		x					?	x	?			x		
[Aard informatie] De student realiseert zich dat bronnen van informatie sterk kunnen variëren in inhoud, vorm, relevantie en waarde, afhankelijk van de behoefte en aard van de zoekactie. [STIP 2]	x			x					x			x	x		
[specifieke bronnen] De student kent een aantal internetbronnen en databanken voor zijn vakgebied [STIP 1]	x	x						x	x			x		x	
[toegang] De student weet hoe je toegang tot de internetbronnen en databanken krijgt en hoe je ze kan vinden. [STIP 1]	x	x						x		Libr vs int			x		
[toegang] De student weet hoe hij vakspecifieke databanken kan filteren [STIP 1]	x			x				x	x	Libr vs int			—	—	—
[Algemeen] De student kan eenvoudige zoekmethoden en -technieken [illegible]	x	x		x				x	x	Search terms			x		

Scoring Rubric

- A scoring tool for qualitative rating of authentic or complex student work
- Used rubric developed by Jos van Helvoort
- Rating project reports of students + logbook

Scoring rubric for Information Literacy **Name teacher / grader:** **Name/ID-No. student:**

student product

	Criterion	*Professional behaviour*	*Insufficient behaviour*	
1	Orientation	☐ The student product makes clear that the student did a good orientation on the topic and that he/she formulated his/her own focus on the topic or research question. This is also expressed by the fact that the student formulated one or more good research questions.	☐ The student product makes clear that the student used the question as it was originally formulated in the assignment or student task. The student him/herself did not further explore the question as such. An example of this behaviour is that the student did not define the core key terms and that these terms are supposed to be clear while they are at least multi interpretable.	Grade 1-20=
Score:		0 very good 0 good 0 sufficient	0 poor 0 bad 0 very bad	

	Criterion	*Professional behaviour*	*Insufficient behaviour*	
		☐ The student product has a reference list that is	☐ There is no reference list in the student product and / or	Grade 1-10=

Results

Hopefully they will be presented at:

Opportunities and limitations for libraries: experiences

Opportunities for libraries

- Rethink the way students learn and the way we teach
- Improve our Information Literacy programs:
    - more alignment with programs
    - using technology
    - better (online) materials
- Efficiency: being able to do more in less time

Limitations for libraries

- Library instructors can’t assign homework to students
- Library instructors can’t assess students (summative)
- A limitation in (online) possibilities (f.e. interaction, motivation) because we don’t see them on a regular base
- Constraints within the organisation (contact hours, available technology and support etc.)

A few last tips:

- cooperate with teachers and policy makers
    - planning and homework
    - content: workshops within educational programs
- cooperate with the educationalists
- make sure that teachers, policy makers and students are willing to participate
- take care of internal organisation and training
- start with instructional design and align align align

Ready to flip?

Hogeschool van Amsterdam
University of Applied Sciences

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http://www.amsterdamuas.com/library

References

Christensen, C.M., Horn, M.B. & Staker, H. (2013). *Is K–12 blended learning disruptive? An introduction to the theory of hybrids*. (White paper) Retrieved from Clayton Christensen Institute website: http://www.christenseninstitute.org/publications/hybrids/ [slide 5]

Helvoort, A.A.J. van. (2016). *Beoordelen van informatievaardigheden in het hoger onderwijs* [thesis]. Delft: Haagse Hogeschool. [slide 65]

Hofmann, J. (2011). *Blended learning*. *Infoline* 28(108)

Mediacore. (2012). Flipping the Classroom: Explained [Video file]. Retrieved from: https://www.youtube.com/watch?v=iQWvc6qhTds [slide 6]

Images

Slide	Source
4	Teaching icon: http://www.cmaid.org/wp-content/uploads/2013/03/teaching-icon.png
4	Blender-grinder-mixer-equipment https://pixabay.com/en/blender-grinder-mixer-equipment-575445/ **CC0 Public Domain**
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22	Constructive alignment (Biggs & Tang) https://www.researchgate.net/figure/275040297_fig3_Fig-4-Constructive-alignment-Biggs-and-Tang-2007
63	Daniele Lusk. Blooms-taxonomy-1k4snjn https://www.google.nl/search?q=bloom%27s+taxonomy&biw=1366&bih=631&tbm=isch&tbo=u&source=univ&sa=X&sqi=2&ved=0ahUKEwj92pas3pnPAhVZOMAKHebbAWQQsAQIGw#q=bloom%27s+taxonomy&tbm=isch&tbs=sur:fmc&imgrc=NLJj2s3moPA7fM%3A **CC BY SA**