

Interactive courseware to connect discussion to course material: So what? (ARC 2021)

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**Matt Smith &
Howard Scott**

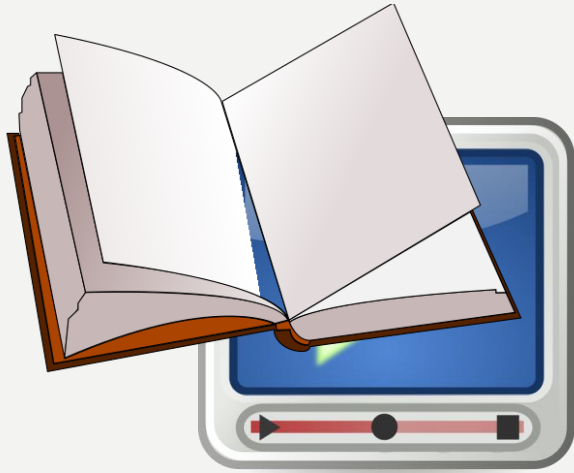
*University of
Wolverhampton, UK*

(Tinne De Laet)

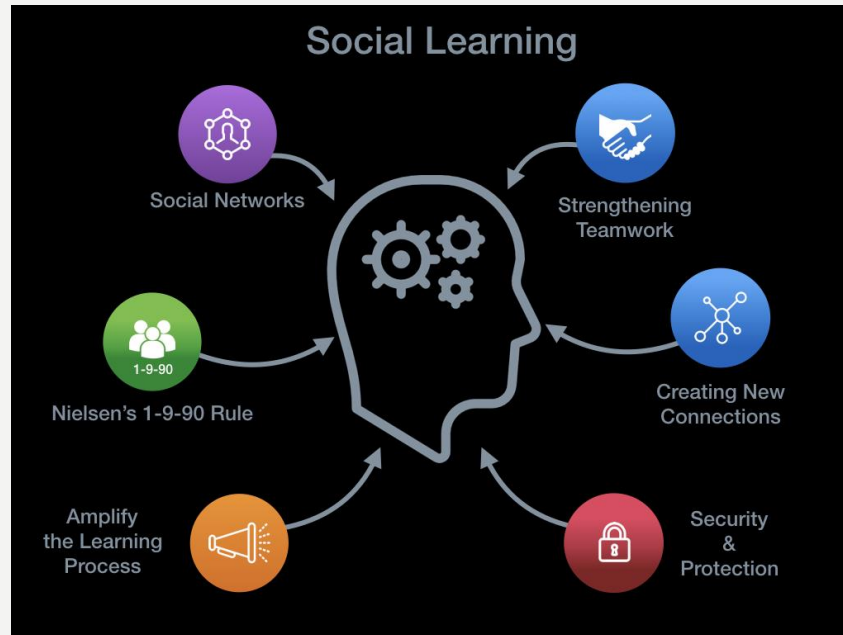
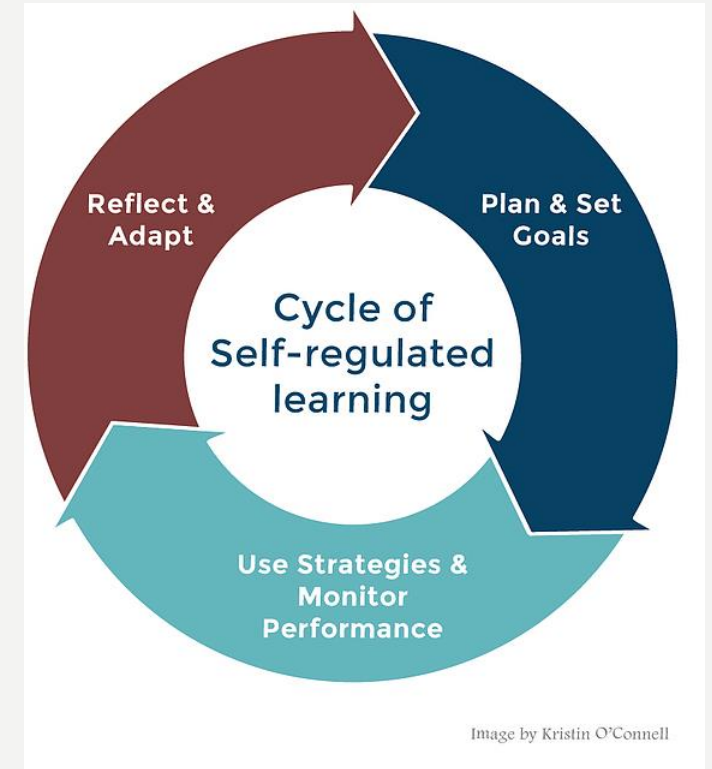
*(KU Leuven,
Belgium)*

INTERACTIVE
COURSEWARE TO
CONNECT
DISCUSSION TO
COURSE
MATERIAL: SO
WHAT?

NEED?



Course material



Asynchronous



Social Learning?

From: <https://stevenewolf.com/social-learning-gamification/>

PLATFORM FOR NEXT-GENERATION TEXTBOOKS



- Nextbook platform (www.nextbook.be)
 - “Next-generation” textbooks
 - Interactivity:
 - Content
 - Other learners
 - Teachers
- } Social learning environment

Demonstration:

<https://nextbook.io/book/sample-course>

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AFFORDANCES & THEORETICAL UNDERPINNING

AFFORDANCES

- Collaboration
- Creativity
- Self-directed learning
- Personalized resources

THEORETICAL UNDERPINNING

- dialogic practice
- heutagogy (self-determined learning)
- student empowerment
- nurturing agency in students

“NORMAL” TEACHING CONTEXT



big classroom - theory

Flipped teaching



exercise sessions

“FLIPPED” TEACHING CONTEXT



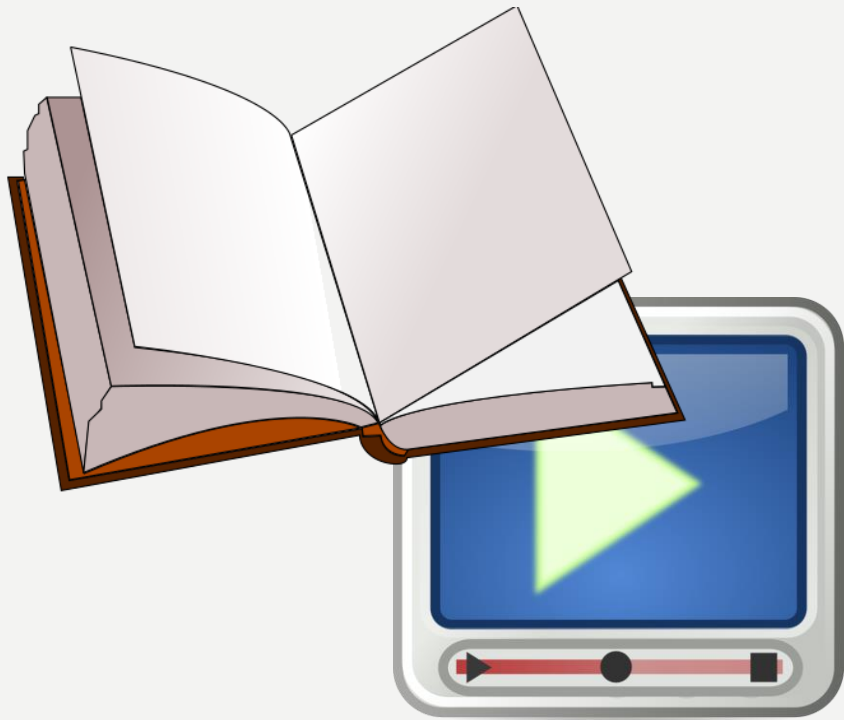
Individual/group study outside the classroom



Interactive lecture
with Q&A and discussions

CASE STUDY CONTEXT

Flipped teaching



Interactive lecture
with Q&A and discussions



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CASE STUDY - ISSUE

<input type="checkbox"/>	Date	Thread	Author	Status	Tags	Unread Posts	Unread Replies To Me	Total Posts
<input type="checkbox"/>	14/01/21 16:53	Quick Questions	Duygu Sezen Islakoglu	Published		0	0	3
<input type="checkbox"/>	14/01/21 10:53	Solution sketch to exam 2015 ProbLog question	Luc De Raedt	Published	Answered in Q&A	0	0	1
<input type="checkbox"/>	14/01/21 00:38	d-seperation question	Evangelia Balini	Published	Answered in Q&A	0	0	2
<input type="checkbox"/>	13/01/21 16:01	Miscellaneous questions	Ioannis Ioannidis Karatsivoulis	Published	Answered in Q&A	0	0	2
<input type="checkbox"/>	13/01/21 15:58	Gibbs Sampling	Milos Dragojevic	Published	Answered in Q&A	0	0	2
<input type="checkbox"/>	13/01/21 15:51	Exam 2015 2nd Question Part B	Umut Caliskan	Published	Answered in Q&A	0	0	2
<input type="checkbox"/>	13/01/21 15:45	Exam Question Markov Networks: Contagious Disease	Rafaël Michiels	Published	Answered in Q&A	0	0	5
<input type="checkbox"/>	13/01/21 15:41	Unreliable evidence	Rafaël Michiels	Published		0	0	2
<input type="checkbox"/>	13/01/21 15:15	Independence in belief nets	Nupur Jhankar	Published	Answered in Q&A	0	0	1
<input type="checkbox"/>	13/01/21 14:10	Problog Inference Formula Compilation in Circuit	Milos Dragojevic	Published	Answered in Q&A	0	0	1
<input type="checkbox"/>	13/01/21 13:09	Hidden Markov Model- exercise session 3 exercise 1	Ioannis Ioannidis Karatsivoulis	Published	Answered in Q&A	0	0	1

Students' questions and discussions on the “discussion platform” are not connected to the course material

Result:

- No “overview” of the questions and answers (students and teachers)
- Students do not spot interesting Q&A or discussion when they are studying the content
- Students ask similar questions multiple times

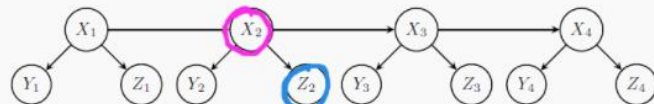
CASE STUDY – ASYNCHRONOUS DISCUSSION IN NEXTBOOK

Question 9

Select this text to ask a question regarding this exercise.

Written solution

9. (6pts) Sampling: Consider the following Bayesian network.



(a) (4pts) Assume you want to obtain, as efficient as possible, ONE sample for each of the queries below using **ancestral sampling**, assuming you have a list of random and independent samples from a uniform distribution between 0 and 1 available.

Indicate for each of the queries a) if you would need rejection or not, b) list the (un)conditional probabilities available in the network that have to be sampled from, in the order they have to be sampled from, and c) order the queries according to efficiency (assuming each (un)conditional probability of the network is equally efficient to sample from).

query	rejection needed: Yes/No	ordered list of (un)conditional network probabilities	computational efficiency (1=most efficient, 3=least efficient)
$P(X_2)$	No	$P(X_1)$ $P(X_2 X_1)$	1

For the last exercise: shouldn't the expression be normalised? Because if you want to sample X_4 in practice you need to normalise it as well.



Conor O'Rourke

(already a reply, but will still handle the question in the Q&A) For sampling, the normalization does not matter as it is a `normalization_constant`, independent of the variable we want to sample. You can also check this in the lecture notes for rejection sampling for instance, there we also need to know the target distribution up to a normalization constant.

Jij

Antwo

CASE STUDY FINDINGS

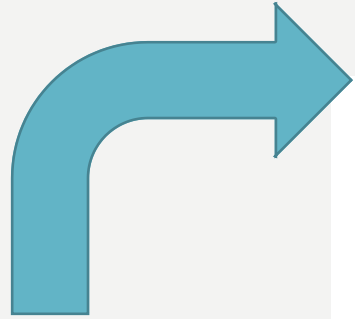
POSITIVE

- Integration with LMS
- Students see questions and discussion already when viewing material
- Fewer duplicate questions
- As teacher: easier to get overview of difficult parts to be discussed in interactive session or points for improvement of material

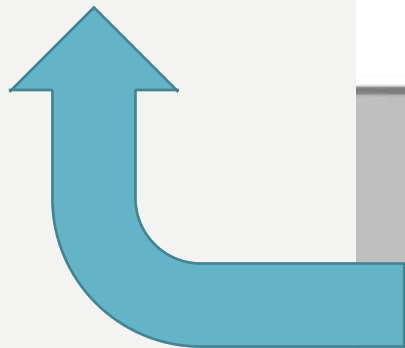
TO BE IMPROVED

- Which questions are new?
- Analytics: how/when are students using the platform

TOWARDS USEFUL ANALYTICS



Instructional Design



meaningful
learning
traces

answer
pedagogical
questions



Basic asset.
Raw material
to be transformed
into
analytical insights.

Process to add
intelligence
to data using
algorithms.

Critical step towards
achieving the purpose:
Improving **students'**
performance

Learning Analytics

AN OPPORTUNITY FOR COURSE TUTORS

Use Nextbook for free for your pedagogical use cases and on your courses!

Interested?

- Matt.Smith@wlv.ac.uk
- Tinne.DeLaet@kuleuven.be

Or leave your contact information in the chat!



THANKS!

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