Effects of the ISIS Recommender System for navigation support in self-organised Learning Networks

Hendrik Drachsler, Hans Hummel, Bert van den Berg, Jannes Eshuis, Wim Waterink, Rob Nadolski, Adriana Berlanga, Nanda Boers and Rob Koper

Open University of the Netherlands

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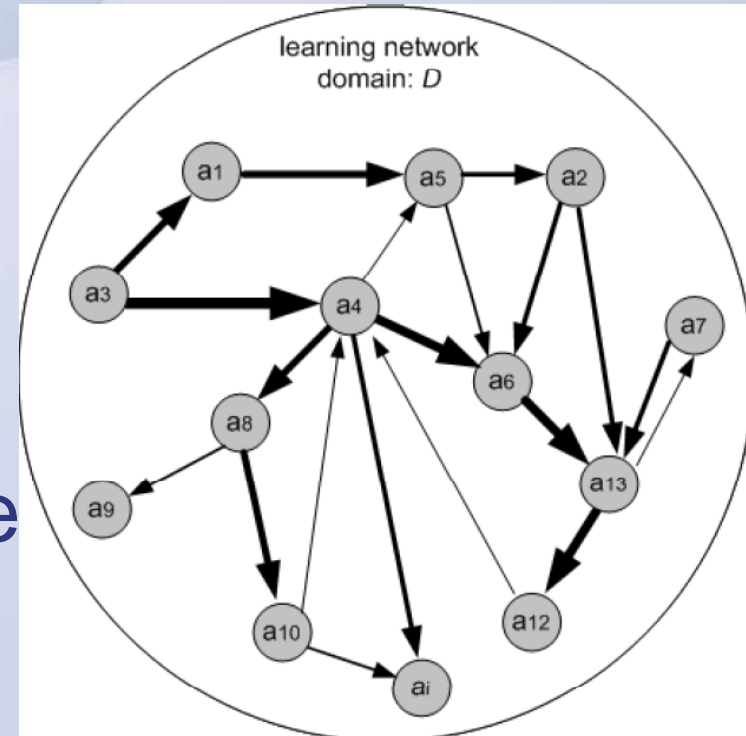
Learning Networks?

- Learners can publish their own Learning Activities (LAs)
- Learners can share, rate, tag and adjust LAs from others
- Explicitly address informal learning

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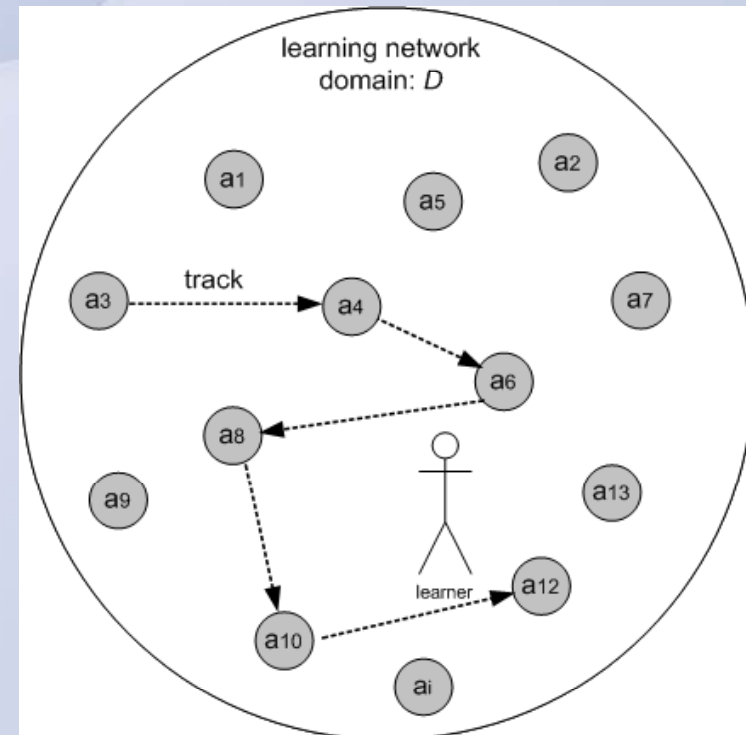
Self-organisation in Learning Networks

- A Learning Network *emerge* form the bottom upwards (versus top down systems)

- Learners create a large amount of Learning Activities (LAs) and behavioural data over time

learning network domain: *D*

a1 a5 a2 a3 a4 a7 a6 a8 a13 a9 a10 a12 ai

How to support self-organisation in emerging Learning Networks?

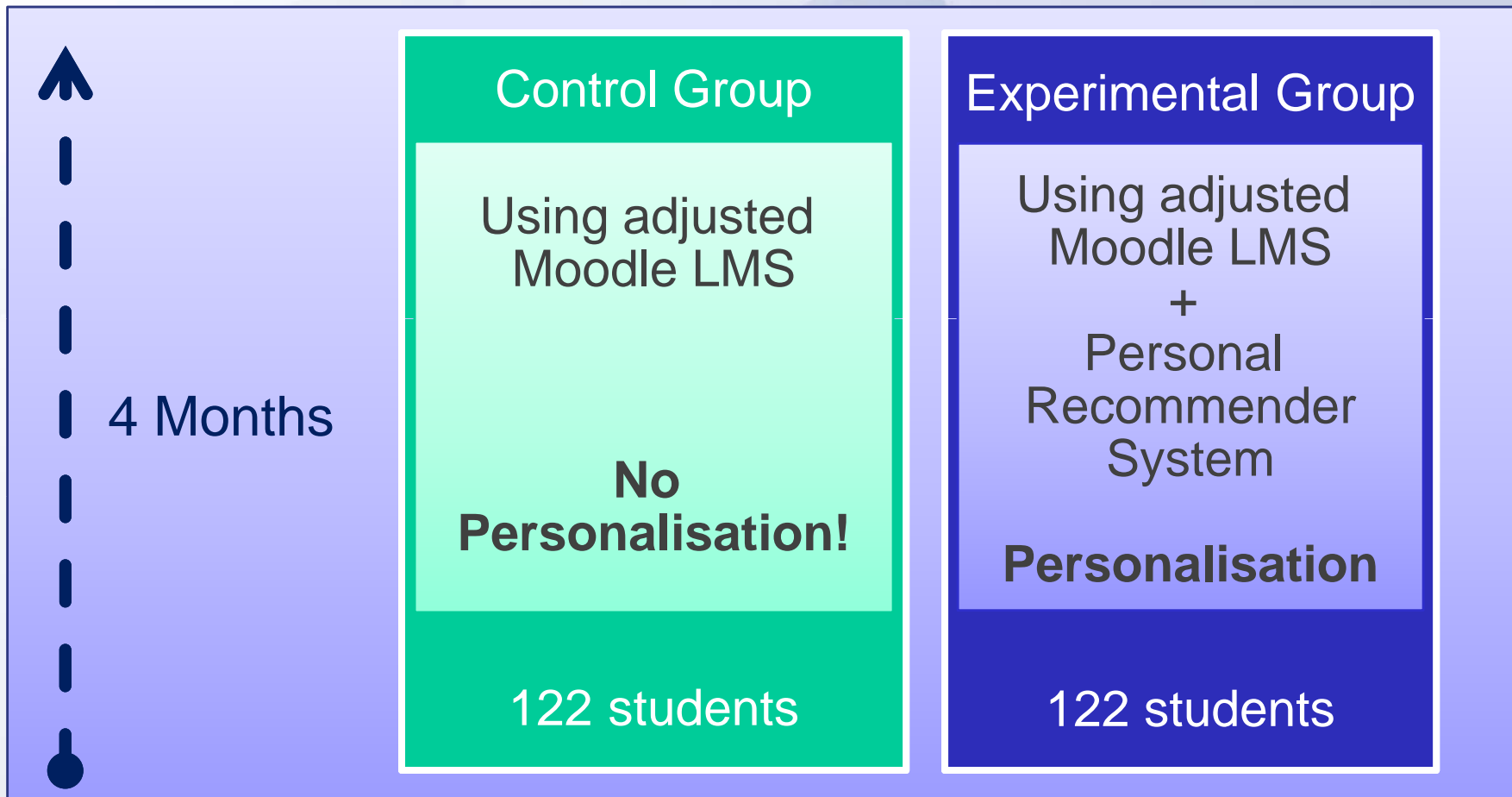# Nowadays, Recommender systems supporting our decisions

Navigation support for informal Learning Networks

- Should enable more personalised learning paths
- Should take into account pedagogical issues and available Learning Activities for recommendations

Experimental Design

4 Months

Control Group

Using adjusted Moodle LMS

No Personalisation!

122 students

Experimental Group

Using adjusted Moodle LMS
+
Personal Recommender System

Personalisation

122 students

Participants

- 244 participants subscribed to this pilot.
- Randomly allocated to control and experimental group (122 learners per group).
- 24 participants (19.7%) in the experimental group and 30 participants (24.5%) in the control group never logged into the Moodle environment.
- This leaves a group of 190 learners who did enter the Moodle environment; 98 in the experimental and 92 in the control group.

The ISIS Recommender System

- Combined a domain ontology with

- Stereotype filtering in a recommen-dation strategy

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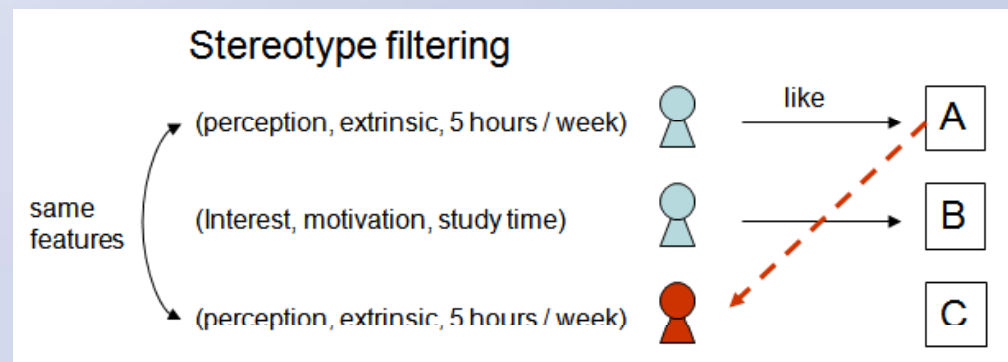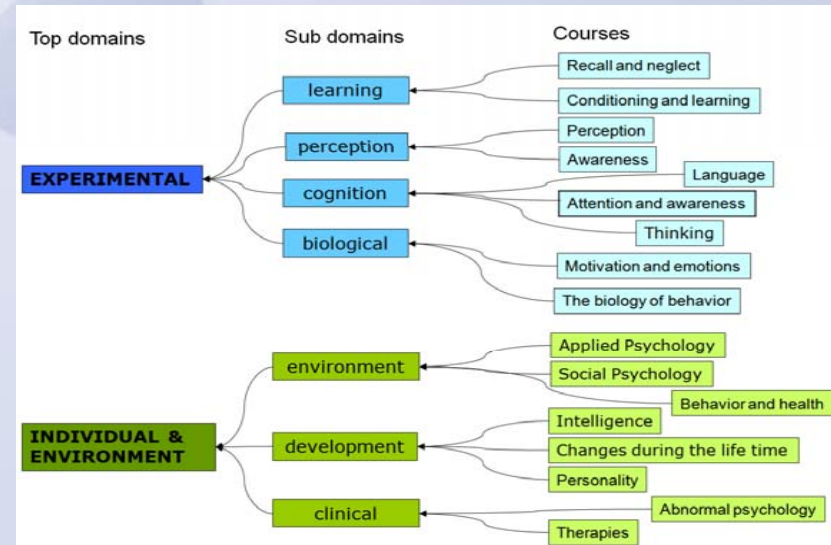
Get recommendation

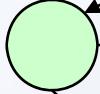*Already finished chapter by learner available?*

[available]   **[not available]**

*Check if recommendation
could be given on most
similar group with
all personal attributes*

*Remove some personal attributes to create new peer group
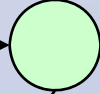and check if recommendation on new group is possible*
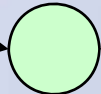
use personal interest
in subdomain

[no]   **[no]**

[yes]   **[yes]**

**Use

stereotype filtering**

**Use

ontology**

PRS Recommendation

The adjusted Moodle Environment

Overview of learning activities

You already completed:	Activities you are enrolled into:	You still need to complete:
You have not completed any learning activity.	Perception	Behavior and health
	Personality	Thinking
	Awareness	Social Psychology
	Changes during the life time	Conditioning and learning
	Therapies	Abnormal psychology
	Language	Recall and neglect
		Intelligence
		The biology of behavior
		Motivation and emotions
		Attention and awareness
		Applied Psychology

Based on your study interest in "**cognition**" (mentioned in your personal profile), we suggest to further study the following learning activity:

Title of the suggested learning activity	Options
Thinking	description of the recommendation	adjust profile

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Hypotheses

1. The experimental group will be able to complete more LAs than the control group (Effectiveness).

2. The experimental group will complete LAs in less time, because alignment of learner and LA characteristics will increase the efficiency of the learning process (Efficiency).

3. The experimental group has a broader variety of learning paths than the control group because the PRS supports more personalised navigation (Variety).

4. The experimental group will be satisfied with the navigational support of the PRS (Satisfaction).

Results / Effectiveness

- The experimental group was consistently found to be more effective in completing LAs than the control group during the experimental period.

- But we have not found a significant difference; therefore, hypothesis 1 cannot be confirmed.
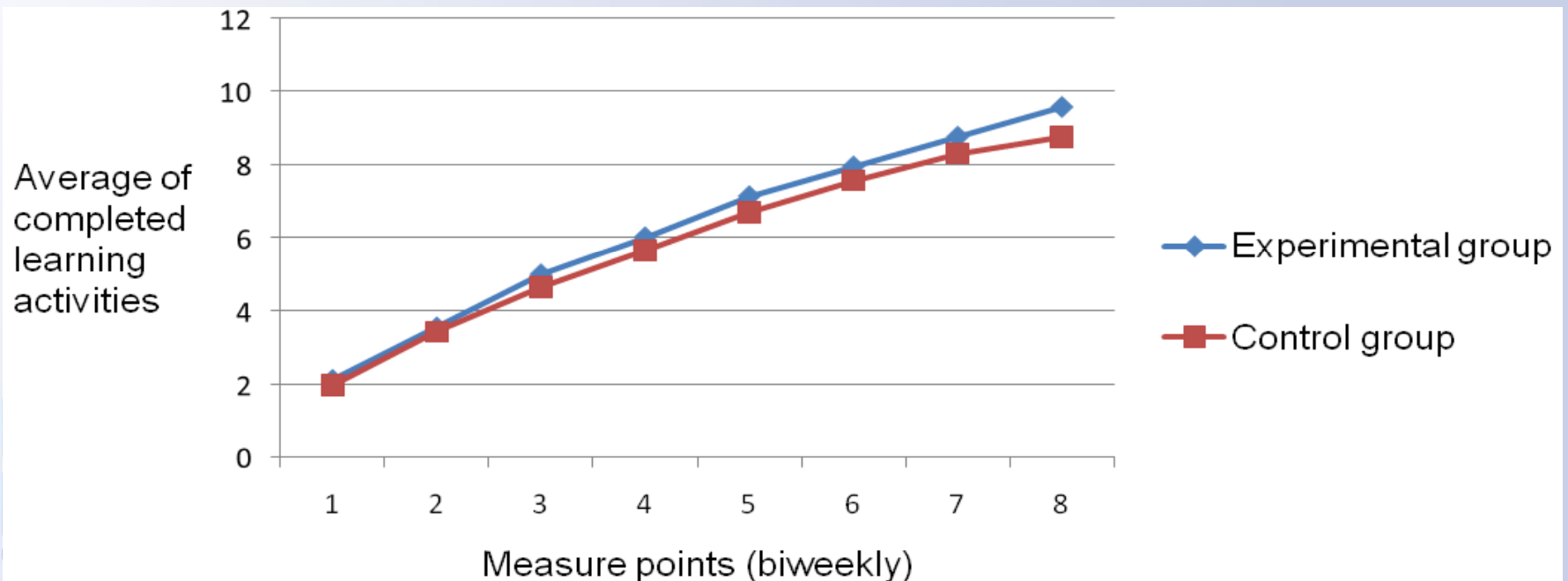
Results / Efficiency

- The experimental group consistently needed less time to complete equal amounts of LAs
- This effect was found to reach significance after 4 months. Therefore, hypothesis 2 could be confirmed.
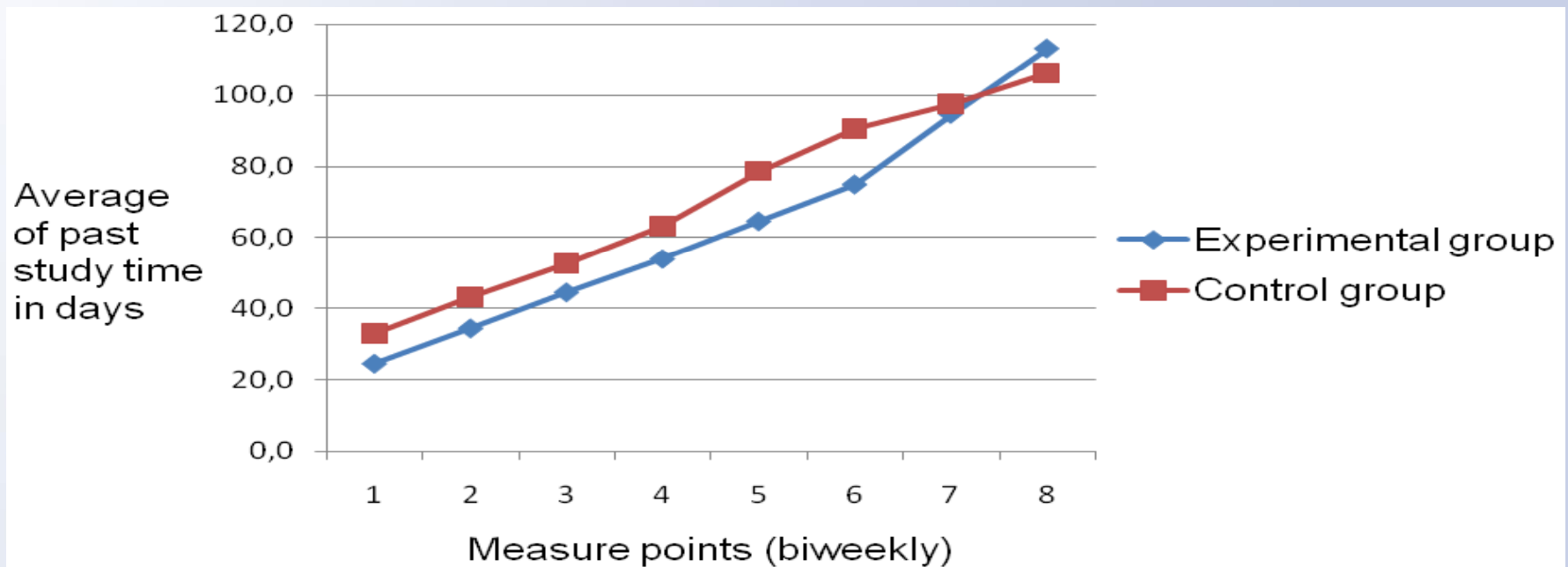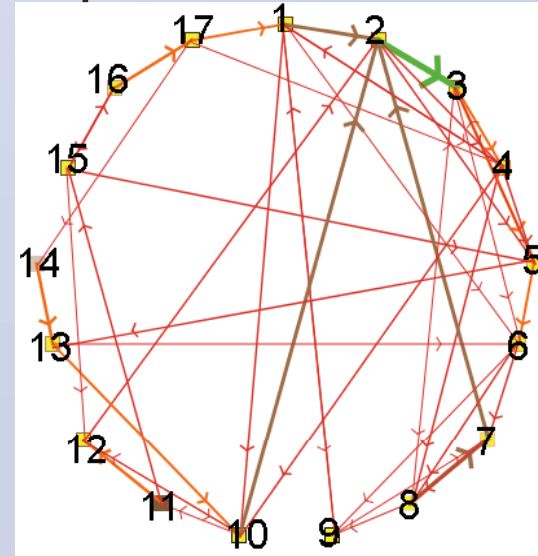
Results / Variety

- The variety of personalised learning paths increased by the PRS. The experimental group from the beginning onward created more personalised learning paths.

- The experimental group made more ties between the Learning Activities in the Learning network, thus we confirm hypothesis 3.

Control group
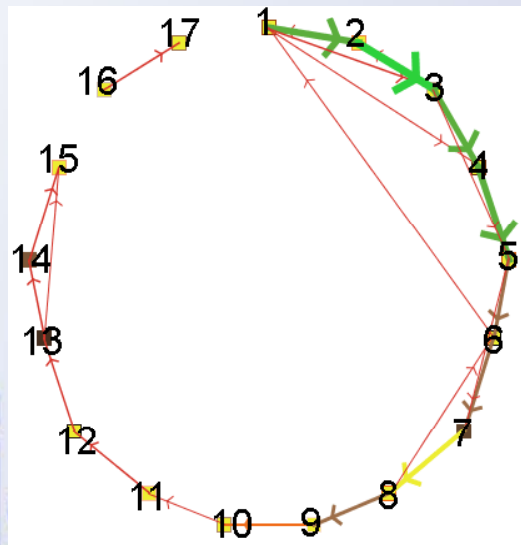
Experimental Group

Results / Satisfaction

- 64% of the participants used the PRS over the whole experimental period very often or often.

- 46% have the impression that the PRS helped them to organise their learning progress in a more personalised way.

- The experimental group was more satisfied with the recommendations based on stereotype filtering.

- Because of the positive responses from the learners and actual usage data we can confirm hypothesis 4.

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Limitations

- The practical character of the experiment, embedded in a formal course with real students excluded some of the navigational problems faced by lifelong learners.

- Elapsed study time as measured through the Moodle environment is only an assistant indicator for real study time.

- We decide to show only the 'best next LA', instead of a list or a sequence with suitable recommendations.

Conclusions

Despite the limitations of the presented study, it partially proofs that the use of navigation support based on a personal-ised recommendation strategy offers a promising way to advise learners on their self-organisation in Learning Networks.

Future research

- Regarding the informal characteristic of Learning Networks, we want to use more bottom-up techniques like collaborative filtering instead of top-down ontologies. In future research we are planning to use explicit ratings and tags given by the learners.

- Currently, we are running series of simulations in Netlogo where we test the impact of additional recommendation techniques for different sizes of LNs.

Many thanks for your interest!