

**On the long-term development of  
information-seeking knowledge:  
Does information literacy instruction matter?**

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**Information-seeking knowledge / Information literacy:** Set of skills required to search for (scholarly) information in order to satisfy an information need (Association of College and Research Libraries, 2010)

- **Fosters an active construction of knowledge** (Brand-Gruwel, Wopereis, & Vermetten, 2005)
- **Critical for conceptual understanding and self-regulated learning** (Tsai, Hsu, & Tsai, 2012)
- **Particularly important in higher education** (Hochschulrektorenkonferenz, 2012; Rosman, Mayer, & Krampen, 2015)
- **Central learning goal in psychology curriculum guidelines** (American Psychological Association, 2013)

**How does psychology students' information-seeking knowledge develop?**

- Library Instruction?
- Curriculum-embedded instruction?
- Self-regulated learning?

**Quantitative empirical research contrasting these three approaches with regard to long-term benefits?**

Virtually non-existent.

**To what extent does information-seeking knowledge develop „naturally“?**

i.e., when controlling for the effects of information literacy instruction

→ Indicator for self-regulated learning.

→ Allows to ascertain if “digital native” students actually require specific information literacy instruction.

## **Is curriculum-embedded information literacy instruction better than library instruction?**

Library instruction has been widely criticized (Anderson & May, 2010; Mery, Newby, & Peng, 2012):

- Generic and domain-unspecific focus
- Narrow scope
- “One-shot” sessions
- Application of knowledge often neglected

## Is curriculum-embedded information literacy instruction better than library instruction?

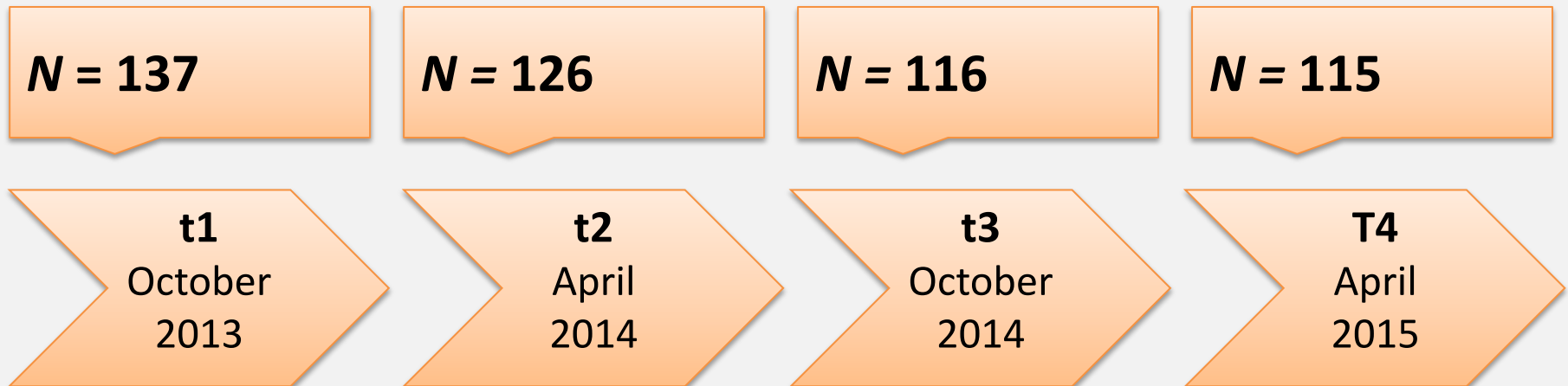
Curriculum-embedded instruction has diverse advantages:

- Instruction has to be tailored to a specific discipline.
- Allows a so-called *whole-task approach* (van Merriënboer & Kirschner, 2013).
- Allows combining direct instruction with self-regulated learning.

## The WisE Study (Mayer, Rosman, Birke, Gorges, & Krampen, in prep)

Four-wave longitudinal study with a cohort of  $N = 137$  first-semester Bachelor psychology students at the first wave

- Age:  $M = 20.43$  Jahre ( $SD = 2.53$ )
- 82 % females, 18 % males



## Assessing information-seeking knowledge

Procedural Information-Seeking Knowledge Test – Psychology Version (PIKE-P), 22 discipline-specific items (Rosman, Mayer, & Krampen, 2015)

- **Basis:** „Skill Decomposition“ of information-seeking knowledge into 10 sub skills (Brand-Gruwel et al., 2005):
  - Selection of search tools
  - Rewording of search terms
  - Use of limiters (e.g., by year)
  - Use of online thesaurus
  - etc.
  
- **Format:** textual presentation of short scenarios and description of response alternatives that are to be evaluated.



*Sample item of sub skill 6—Selection of search tools*

<b>During the writing of your Bachelor thesis, you need several empirical articles about learning strategies of school children aged between 6 and 12 years. How suited are the following tools in order to find the articles?</b>	not useful at all			very useful	
	1	2	3	4	5
A) Online Library Catalog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B) Reference database PsycINFO™	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C) Google Scholar™	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D) Reference database PSYINDEX™	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Note.* With regard to the rather specific sample (school children aged between 6 and 12 years) and the complex nature of the intended search, bibliographic databases (Approaches B and D) are the best choices. Google Scholar (C) is an option, but its hit ratio on complex searches is reduced. Searching the library catalog (A) is useless, as it only indexes books and is not suited for complex information searches.

**Curriculum-based instruction:** Single Likert-scale item on the extent of information literacy instruction in a specific research methods course („behavioral observation methods“). Recoded into a discrete format for data analysis (“no instruction” vs. “less than three hours of instruction” vs. “more than three hours of instruction”)

**Library instruction:** Yes/No item on whether students had participated, at least once, in a library instruction session throughout their studies.

**Data analysis strategy:** Multilevel modeling for longitudinal data (SPSS™ MIXED); 4 waves varying within-person + Covariates (West, Welch, & Galecki, 2014)

	Model 1	Model 2	Model 3
<b>Fixed effects</b>			
Intercept	59.24*** (0.56)	54.86*** (0.65)	57.76*** (1.70)
WAVE	-	3.20*** (0.28)	1.78** (0.68)
CE_INST_R=1 (> 3 hours)	-	-	-2.53 (2.00)
CE_INST_R=2 (< 3 hours)	-	-	-4.72* (2.00)
CE_INST_R=3 (no instruction)	-	-	0.00 (0.00)
LIB_INST_R=1 (yes)	-	-	-1.37 (2.05)
LIB_INST_R=2 (no)	-	-	0.00 (0.00)
WAVE*CE_INST_R=1 (> 3 hours)	-	-	1.76* (0.80)
WAVE*CE_INST_R=2 (< 3 hours)	-	-	1.59* (0.80)
WAVE*CE_INST_R=3 (0 hours)	-	-	0.00 (0.00)
WAVE*LIB_INST_R=1 (yes)	-	-	0.93 (0.82)
WAVE*LIB_INST_R=2 (no)	-	-	0.00 (0.00)
<b>Fit-Indizes</b>			
-2LL	3493.76	3345.31	3031.07
AIC	3497.76	3353.31	3055.07
BIC	3506.15	3370.10	3104.41

*Note.* WAVE ranges from 0 to 3; dependent variable = information-seeking knowledge; elements in parentheses = standard deviations.

- Students seem to develop some information-seeking skills through autonomous, self-regulated learning.
- No significant effects of library instruction. Caveat: Only  $n = 14$  library instruction participants in the whole sample.
- Especially curriculum-embedded information literacy instruction seems well-suited to enhance long-term skill development
- Connecting course topics with information-seeking might be well-suited to foster both content knowledge and information-seeking knowledge development.

# Thank you for your attention!

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## A longitudinal study on information-seeking knowledge in psychology undergraduates: Exploring the role of information literacy instruction and working memory capacity



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### ABSTRACT

No longitudinal studies on whether the acquisition information literacy requires formal instruction or whether it just develops “naturally” have yet been published. Moreover, no studies exist on individual and situational factors moderating the long-term development of information literacy. For these reasons, a three-semester long, four-wave longitudinal study on information-seeking knowledge (a major aspect of information literacy) was conducted with 137 psychology

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**Table 1***Means, standard deviations, and correlations of all study variables*

	<i>M</i>	<i>SD</i>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
1 LIB_INST	-	-	-						
2 CI_INST	-	-	.23*	-					
3 PIKE-P (t1)	54.71	8.41	-.04	-.01	-				
4 PIKE-P (t2)	58.06	8.12	.11	-.02	.42***	-			
5 PIKE-P (t3)	61.66	7.48	-.01	.19*	.38***	.56***	-		
6 PIKE-P (t4)	63.96	8.83	.13	.20*	.39***	.52***	.60***	-	
7 WMC	.71	.10	.15	.10	-.02	.23**	.18 <sup>+</sup>	.32***	-

*Note.*  $N_{t1} = 137$ ;  $N_{t2} = 126$ ;  $N_{t3} = 116$ ;  $N_{t4} = 115$ ; *M* = arithmetic mean; *SD* = standard deviation; LIB\_INST = participation in a library instruction course (discrete); CI\_INST = curriculum-integrated information literacy instruction (discrete); PIKE-P = information-seeking knowledge; t1-t4 = waves; WMC = working memory; no means calculated for LIB\_INST and CI\_INST because of their discrete nature; all correlations including discrete variables are Spearman correlations, all other correlations are Pearson correlations.

<sup>+</sup>  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .