

Supportive hints in a digital learning environment: Effects on students' motivation

Contact: m.ter.beek@rug.nl



M. ter Beek, L. Brummer, & M.-C. Opdenakker
Groningen Institute for Educational Research (GION), The Netherlands



Introduction

Students' motivation has an important influence on reading achievement. However, students need to recognize the task value or decrease the perceived difficulty of a task in order to be motivated to read a text.¹ Reading motivation is a problem many content area teachers face when instructing their secondary students.

Incorporating cognitive, metacognitive and motivational support during instruction increases students' motivation towards learning from text.² Students were offered these three types of support using hints in a digital learning environment (DLE) while they read informative texts for geography and history classes.

Research question

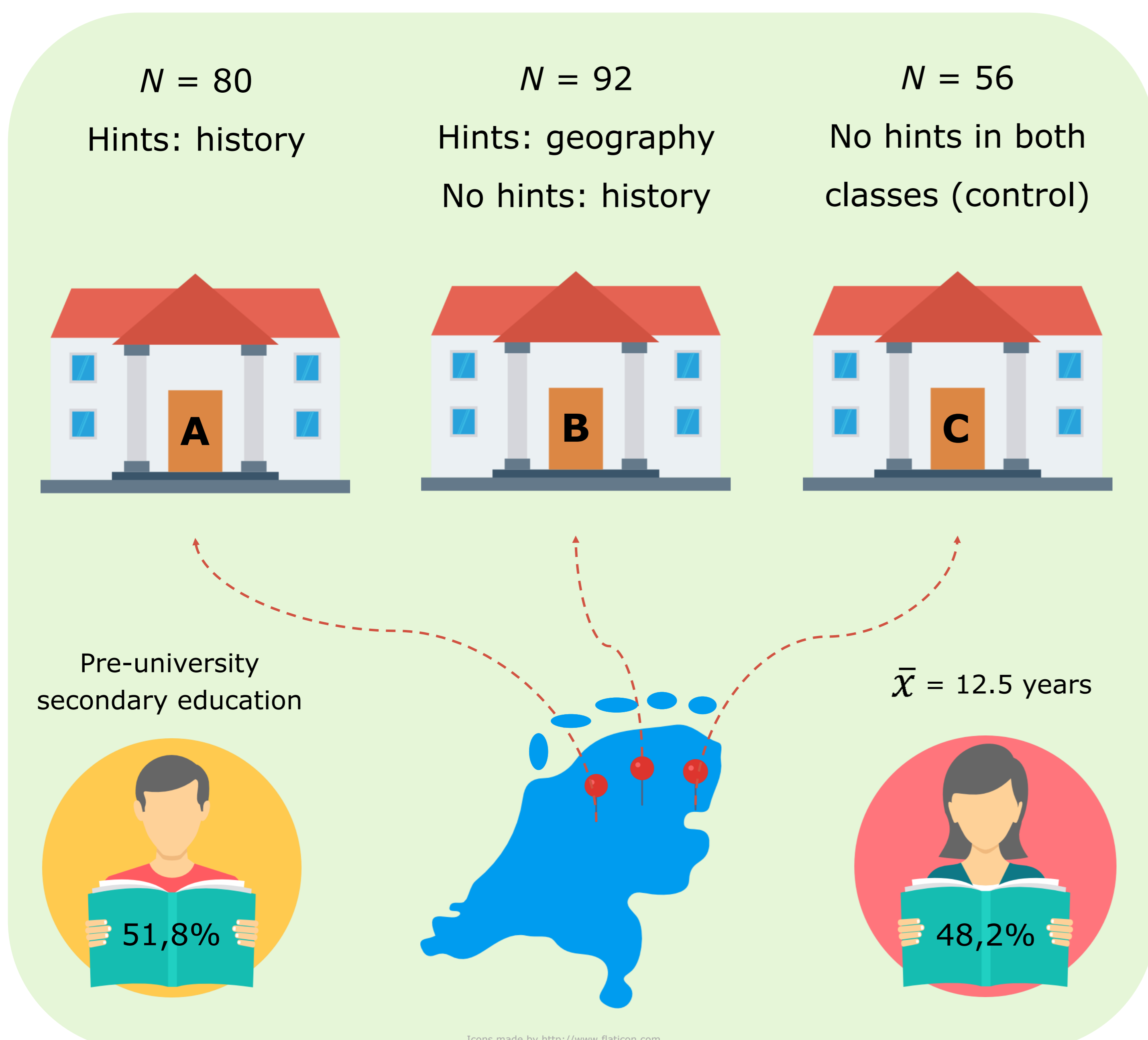
What is the effect of supportive hints in a digital learning environment on secondary students' motivation in geography and history classes?



Method

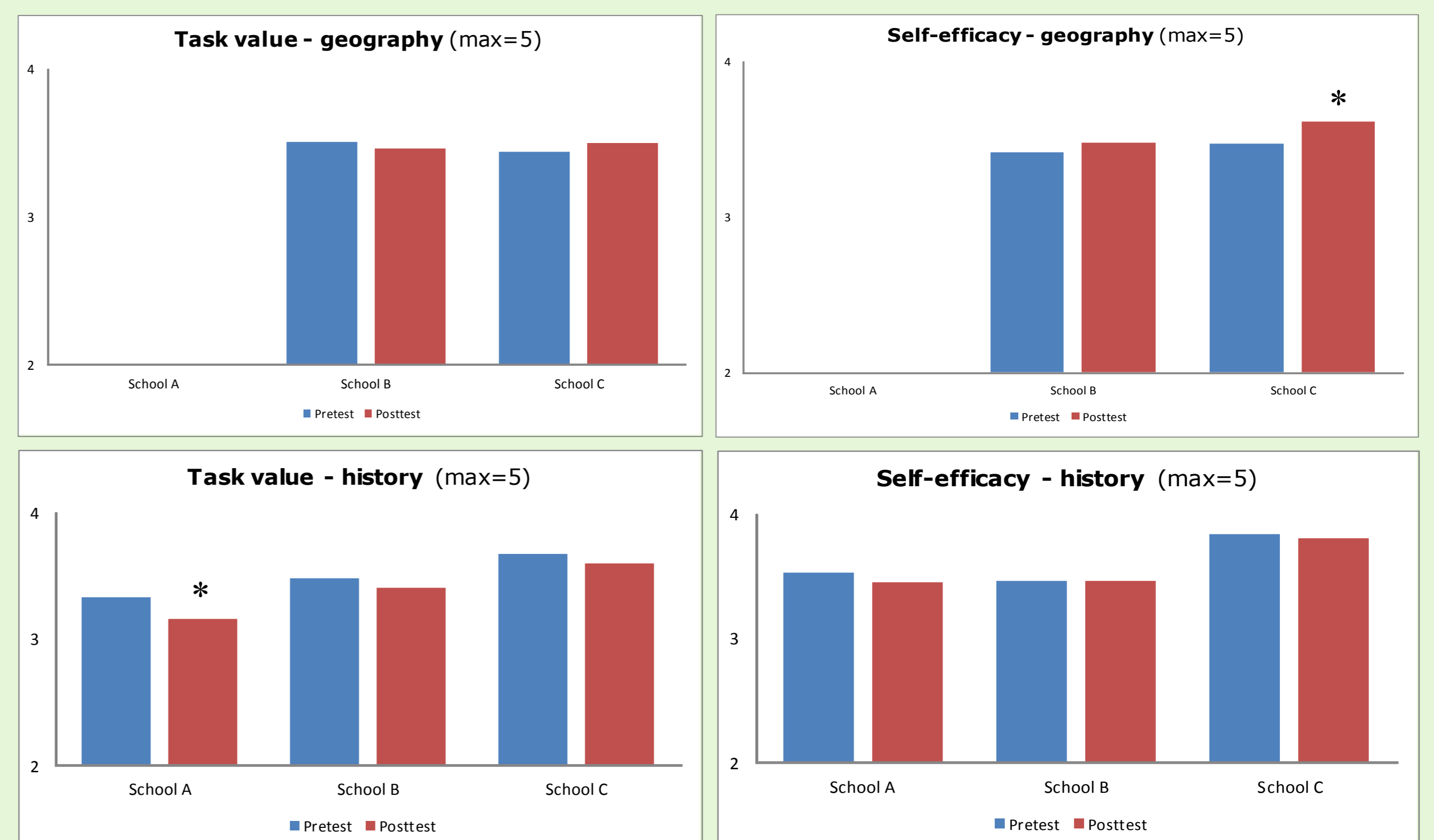
Four geography teachers and six history teachers implemented the use of the DLE in their first grade secondary school classes. During a six-week intervention period, students ($N = 228$, $M_{age} = 12,5$ years) weekly read one text for each class in the DLE. Both experimental groups (A & B) were able to use hints in either geography or history texts. The control group (C) was unable to use hints.

This research uses a pretest-posttest design. Two components of motivation are measured with the MSLQ: task value (e.g., *Is this course useful to me?*) and self-efficacy (e.g., *Am I good at this?*)³ Student data was analyzed using ANOVA, GLM and paired samples t -tests.



Results

For geography, the difference between self-efficacy pretest - T1 - ($M = 3.47$, $SD = .46$) and posttest - T2 - ($M = 3.61$, $SD = .48$) scores of school C is significant; $t(38) = -2.08$, $p = .044$.



For history, the difference between task value pretest - T1 - ($M = 3.33$, $SD = .70$) and posttest - T2 - ($M = 3.15$, $SD = .63$) scores of school A is significant; $t(77) = 2.83$, $p = .006$.

Conclusion & discussion

The results presented here are not in line with previous research on the effects of reading strategy instruction on students' motivation:



* Self-efficacy *increased* significantly in the control group (geography; no hints available).



* Task value *decreased* significantly in the experimental group (history; hints available).

Currently no motivational hints were offered. Adding motivational hints to the DLE may elicit positive effects on students' motivation.

Recommendations for practice

Student evaluations revealed that students enjoyed working with the DLE. However, in order to keep students motivated to learn, a DLE with supportive hints should be used in addition to regular classes, not as a continuous replacement hereof.

References

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Additional analyses and information



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Groningen Institute for Educational Research (GION), The Netherlands

Contact: m.ter.beek@rug.nl

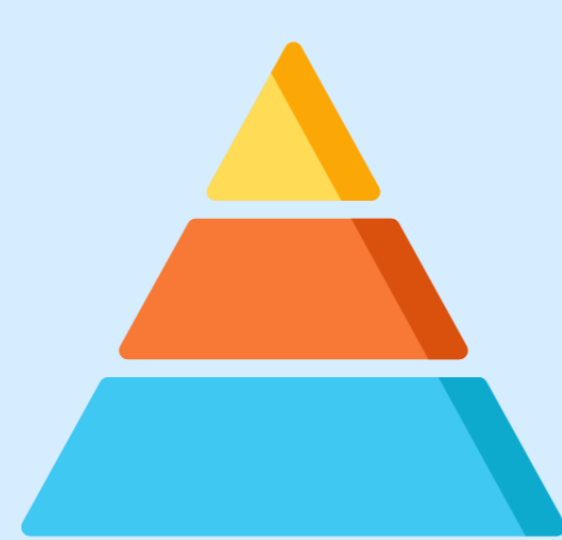


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Excluding highest educational levels

During evaluation questionnaires and focus groups with students it became clear that students in the highest levels of education were motivated the least after working in the DLE. They did not recognize a need to practice their comprehensive reading, which led to lower task value scores in both school A and B (school C did not entail these high educational levels). Therefore, these classes were excluded from the experimental groups to strengthen the comparability of the groups. The same analyses were conducted afterwards.

In the Dutch educational system, *gymnasium* and *vwo+* are the highest educational levels. They are comparable to regular *vwo* (pre-university secondary education), but provide additional subjects such as Latin or Greek.



For geography, this exclusion did not lead to more significant differences between task value and self-efficacy scores in both groups. For history, however, there was no significant decrease in task value scores between T1 ($M = 3.26$, $SD = .69$) and T2 ($M = 3.15$, $SD = .57$) in school A anymore ($p = .130$), confirming the idea that students in the highest educational level value practicing reading comprehension less.

Initial reading levels & motivation

It is questionable whether students' initial reading levels or initial task value and self-efficacy for a course influence their self-regulated use of hints in a DLE, and also their subsequent task value and self-efficacy beliefs.⁴ Therefore, similar GLM analyses were conducted that included scores from a pretest on comprehensive reading⁵ and task value/self-efficacy scores from T1 as covariates. It appeared that the initial reading scores did not influence students' task value or self-efficacy.

Task value scores (T2) - geography

Variable	Significance (p)	Effect Size (η^2)
Comprehensive reading pretest	.807	.001
Task Value score T1	$\leq .001$.454
Experimental condition	.455	.005

Self-efficacy scores (T2) - geography

Variable	Significance (p)	Effect Size (η^2)
Comprehensive reading pretest	.728	.001
Self-efficacy score T1	$\leq .001$.441
Experimental condition	.189	.015

Task value scores (T2) - history

Variable	Significance (p)	Effect Size (η^2)
Comprehensive reading pretest	.759	.000
Task Value score T1	$\leq .001$.419
Experimental condition	.047	.029

Self-efficacy scores (T2) - history

Variable	Significance (p)	Effect Size (η^2)
Comprehensive reading pretest	.081	.015
Self-efficacy score T1	$\leq .001$.414
Experimental condition	.102	.022

Adding motivational hints

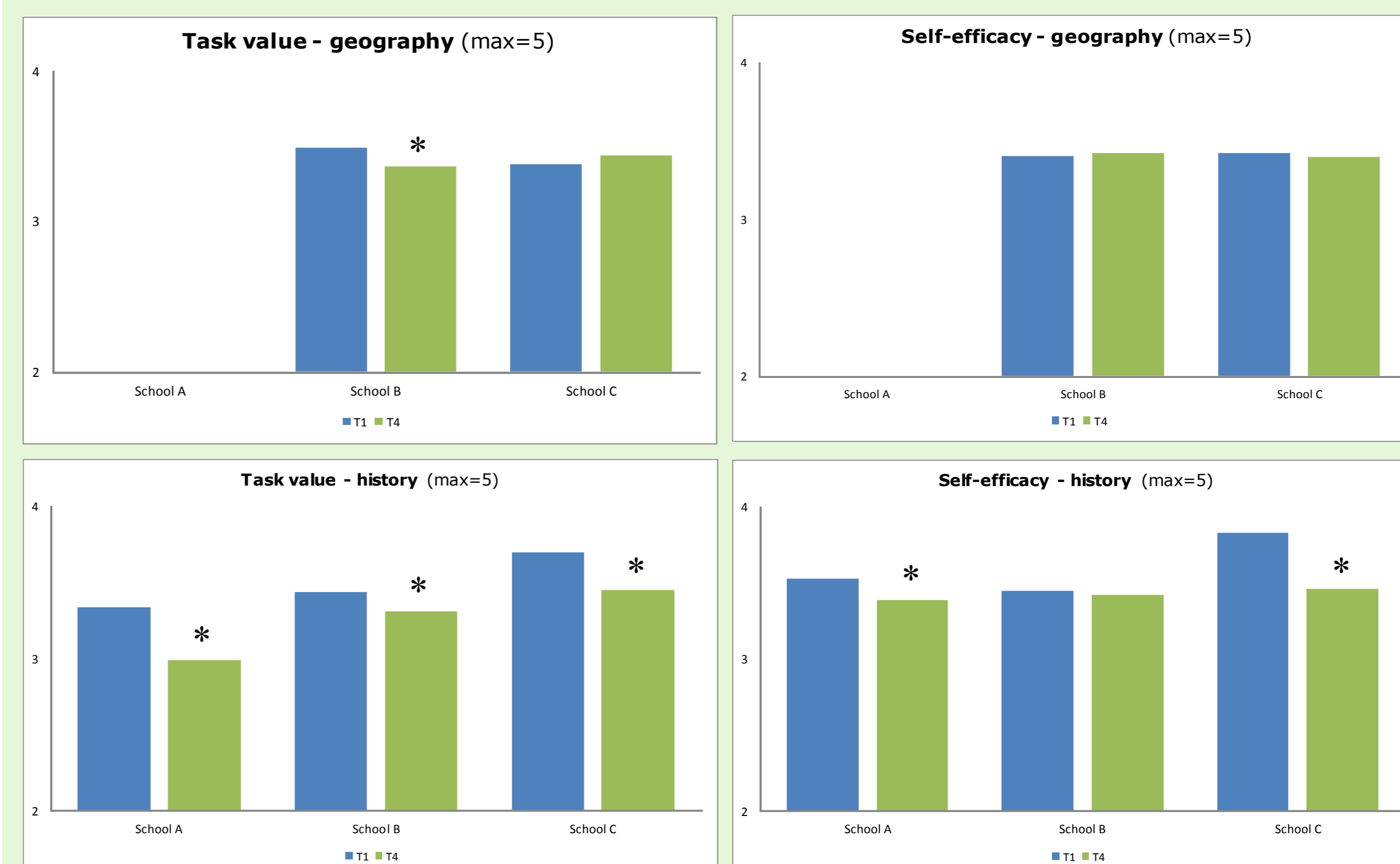
In the first semester students could only consult cognitive and metacognitive hints. During the second semester, motivational hints and prompts were added in the experimental groups to determine whether this addition would yield different results. However, none of the groups showed a significant increase or decrease in either task value or self-efficacy scores for both courses during this semester.

Developments during one school year

Students filled in the MSLQ-questionnaire four times during one school year. By comparing T1 and T4, the influence of working in a DLE on students' motivation during one school year can be analyzed as well.

Measurement	T1	T2	T3	T4
Date	October '16	December '16	February '17	April '17

There was a significant decrease in the task value scores on T1 and T4 for school B for geography: $p = .010$. No significant differences were found between geography self-efficacy scores.



There were significant decreases in the task value scores on T1 and T4 for school A, B, and C for history: $p \leq .001$, $p = .025$, and $p = .005$, respectively.

Also, the self-efficacy scores for history decreased significantly in school A and school C: $p = .011$ and $p \leq .001$, respectively.

Recommendations for future research

Unfortunately this research does not show a positive relationship between the provision of support in a DLE and an increase in students' motivation to learn. Therefore, future research should also include



other types of student motivation, such as interest and volition. Next to that, the role of the teacher should also be taken into account when researching DLEs.

References

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