Is it possible to measure learning strategies with questionnaires "online"?

Results of a study comparing a "traditional" questionnaire with a "nearly online" questionnaire

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1. Introduction

Research on learning strategies has been a steadily growing area for decades (Zimmerman, 2008). Especially for the last years the importance of learning strategies increased within the framework of self-regulated learning environments (Boekaerts, Pintrich & Zeidner, 2000). But there are still problems to measure them. The most used instruments are self-reports. These instruments are increasingly criticised due to their validity. One reason is that against all expectations significant correlations between the use of learning strategies and achievement were only occasionally shown. In particular, this seems to be a problem of the validity of self-reports. So called "online" methods record learning strategies directly in the learning process. They seem to improve the validity but these methods are not appropriate to examine large populations. Thus there is still a lack of appropriate instruments.

2. Theoretical Background

To answer self-report questionnaires the respondents have to decide how much they agree or disagree with statements describing their habitual learning process. Subjects have to estimate for example how often they act in the following way: "When I study I put important ideas into my own words" (MSLQ; Pintrich, Smith, Garcia & McKeachie., 1993). Those instruments, their scales and subscales were verified in several studies and stand out due to high reliability. Additionally, questionnaires are easy to administer to large populations (Moschner, Anschuetz, Wernke & Wagener, 2008). But those "traditional" questionnaires, so called "offline" measures, record learning strategies retrospectively (Zimmerman, 2008). The respondents are supposed to reflect their own learning process, to give information about their habitual use of cognitive and metacognitive strategies, and to judge their resource management. However, it is doubtful if respondents are really able to reflect their learning process in a realistic way. As a result questionnaires are more and more criticised concerning their validity (Zimmerman, 2008; Spoerer & Brunstein, 2006).

3. Aims

Aim of our study was to develop a more valid questionnaire to measure learning strategies of large samples.

⇨*Therefore we designed two questionnaires, a common* ***"offline"*** *and a* ***"nearly online"*** *instrument and analysed them in three steps:*

1.) We examined if both measures are suitable and reliable instruments for assessing the use of learning strategies.

2.) We investigated if it is possible to record learning strategies with questionnaires "nearly online" in order to get more realistic and consequently more valid answers.

3.) As a last step of the study we compared both instruments and examined if there are any differences between the answers to all subscales of both instruments.

4. Methods

We investigated N=119 elementary school children (age: M = 9;2 years) with two kinds of questionnaires, a common retrospective questionnaire ("offline") and a "nearly online" instrument.
The "offline" questionnaire is based on existing instruments like the MSLQ including cognitive (3 subscales: elaboration, rehearsal, organization) and metacognitive strategies (4 subscales: planning, monitoring, evaluation, regulation) on 42 items.
The "nearly online" questionnaire contains the same scales and subscales. Additionally, the first part of the questionnaire is composed of a literary text and 12 comprehension questions. We aimed at measuring the learning strategies as close to the learning process as possible. For the "nearly online" questionnaire the items were reformulated so that they refer to the strategic processing of the initial text and the answered comprehension questions. Afterwards the answers to all subscales of both questionnaires were compared.

Items of both questionnaires

subscale	„offline" questionnaire	„nearly online" questionnaire
elaboration	*„Reading a text I imagine characters and situations of the text."*	*„I imagined the characters and situations of the text."*
rehearsal	*„I memorize important facts by reeling them off aloud and repeatedly."*	*„I memorized important facts of the text by reeling them off aloud and repeatedly."*
organization	*„Reading a text I underline important facts."*	*„I have underlined important facts."*
planning	*„Before I start reading I try to get a general idea of a text."*	*„Before I started reading I looked up the extend of the text."*
monitoring	*„While reading a text I try to find out, if there is anything I do not understand."*	*„While reading the text I reflected contents I did not understand."*
evaluation	*„After reading a text I ask myself if I understood everything."*	*„After reading the text I asked myself if I had understood everything."*
regulation	*„If there are any difficulties with a text I go trough it step by step."*	*„I coped difficulties with the text by going trough them step by step."*

5. Results

The analyses show that elementary school children are able to answer both types of questionnaires. The reliabilities of all scales of both instruments show good α-values ("offline": .59 < α < .87, "nearly online": .66 < α < .86).

The mean values of the scales of the "offline" questionnaire are all between M= 2,7 and M= 3,1 on a 4-point Likert scale (1= That´s not true, 4= That´s absolutely true) except the scale organizational strategies (M= 1,9). Consequently, the students report a frequent use of learning strategies. The most used strategies are strategies of regulation (M= 3,1), organizational strategies are rarely used strategies.

The means of the "nearly online" instrument show the same hierarchic structure, but in all cases, except scale regulation, significantly lower mean values. Strategies that are used most often are strategies of regulation (M= 3,0), less used strategies are organizational strategies (M= 1,7). The other strategies show mean values between M= 2,1 and M= 2,6.

"offline" questionnaire

Subscale	Alpha	Items	Mean	SD
elaboration	.76	9	2,9	.63
rehearsal	.81	5	2,7	.73
organization	.75	5	1,9	.68
planning	.59	6	2,8	.63
monitoring	.76	6	2,7	.62
evaluation	.87	6	3,0	.79
regulation	.65	5	3,1	.62

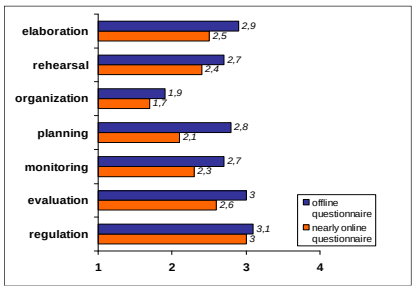
Items had to be answered on a four-point scale ranging from 1 = "That´s not true" to 4 = "That´s absolutely true".

"nearly online" questionnaire

Subscale	Alpha	Items	Mean	SD
elaboration	.85	8	2,5	.86
rehearsal	.83	6	2,4	.84
organization	.66	5	1,7	.56
planning	.73	6	2,1	.71
monitoring	.82	7	2,3	.75
evaluation	.86	6	2,6	.82
regulation	.78	5	3,0	.74

Items had to be answered on a four-point scale ranging from 1 = "That´s not true" to 4 = "That´s absolutely true".

Differences of the mean values



Items had to be answered on a four-point scale ranging from 1 = "That´s not true" to 4 = "That´s absolutely true".

The mean values of the „nearly online" questionnaire are significant lower than the mean values of the „offline" questionnaire ($p < .001$).

Exception: The difference of subscale regulation is not significant ($p = .20$).

6. Summary and Discussion

The analyses show that both questionnaires are reliable instruments. Interestingly, in all cases the students report less use of learning strategies in the "online" questionnaire. Further analyses show that these differences between the two questionnaires are significant. The students report a significant higher use of strategies in the "offline" questionnaire. But the answers to both instruments show the same hierarchic order and tendencies. Earlier research (e.g. Artelt, 2000) showed that students tend to overestimate their strategic acting in "offline" instruments. So the "nearly online" questionnaire seems to record more realistic and correspondingly more valid data.

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