

Examining Students' Self-Regulated Learning Through Self-Report Data and Behavioral Logs

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Method

A total sample of 166 students enrolled in an introductory biology course participated in the study. At the beginning of the Spring 2020 semester, students completed a set of self-report measures including metacognitive awareness (Dennison & Schraw, 1994; Harrison & Vallin, 2018), strategy use, and self-efficacy for strategic learning. Then, we extracted students' behavioral logs (e.g., views of learning objectives) from the LMS and merged the datasets for correlational analyses.

Results

Several significant correlational relations were found. First, students' average views of lecture slides were positively correlated with final course scores. Second, students' clicks on the links for class lectures were weakly positively associated with students' self-regulatory strategy use, and metacognitive awareness. Further, findings showed that students' metacognitive awareness and self-efficacy in higher-level strategic learning were related to their final course scores. The mostly insignificant relationships between self-report measures and behavioral logs were consistent with Quick et al. (2020).

Conclusion

Our findings demonstrated some alignment between students' behavioral logs and their responses to self-report measures and lend some support for the positive effect of students' engagement in the course and use of course materials for their learning. The limited relations between behavioral logs and course performance, however, suggest that typical behavioral logs extracted from the LMS (e.g., number of views) may be inadequate to represent students' SRL processes. Future research should adopt in-depth learning analytics, such as clicks on learning traces, specific practice quizzes related to SRL, and use of SRL prompts, for further investigation.

Introduction

Self-regulated learning (SRL) refers to dynamic and ongoing processes that involve learners' behavior, cognition, metacognition, and motivation (Winne & Hadwin, 1998; Zimmerman, 1995). Students' SRL has been predominantly measured by self-report instruments, which have several limitations (Winne, 2017; 2020; Winne et al., 2002). It is therefore critical to assess and understand students' SRL with multiple data resources (Winne, 2020). A recent study has reported a misalignment between self-report measures and behavioral logs extracted from the Learning Management Systems (LMS; Quick et al., 2020). Such misalignment is concerning and requires further investigation.

Objective

Given the inadequate SRL research on examining the alignment among different data sources, the present study aimed to examine the correlations among undergraduate biology students' SRL-related self-report data, objective course assessments, and behavioral logs extracted from LMS. We also aimed to demonstrate the extent to which various data related to students' SRL would align with one another.

Analysis

	1	2	3	4	5	6	7	8	9	10	11	12	13
1.SRL strategies	1												
2.Generative strategies	.51**	1											
3.Surface strategies	.27**	.32**	1										
4.SE for higher-level strategic learning	.36**	.39**	.25**	1									
5.SE for lower-level strategic learning	.28**	.33**	.22*	.77**	1								
6.Metacognitive awareness	.64**	.50**	.37**	.51**	.39**	1							
7.Views of lecture slides	.03	-.01	-.14	.14	.02	.01	1						
8.Time spent on tests	.15	.14	.17	.09	.02	.06	.03	1					
9.Time spent on quizzes	.18	-.06	-.17	-.05	-.21	.02	.16	.09	1				
10.Views of recordings	.05	.07	.03	.08	.06	-.00	.32*	.04	-.10	1			
11.Views of learning objectives	.15	.15	-.04	.02	-.02	.12	.13	.26*	-.13	.11	1		
12.Views of grades	.07	-.04	.07	-.14	-.15	-.06	.04	.30**	.03	.32**	.13	1	
13.Views of lecture modules	.29**	.06	-.01	.03	.01	.19*	.15	.21*	.15	-.04	.12	.22**	1
14.Final course scores	.16	.13	-.06	.25**	.16	.20*	.35**	.10	.20	.11	.13	-.00	.16

*p < .05; ** p < .001