

ONLINE RESOURCE 2

Prasse, D., Webb, M., Deschênes, M., Parent, S., Aeschlimann, F., Goda, Y., Yamada, M., & Raynault, A. Challenges in promoting self-regulated learning in technology supported learning environments: an umbrella review of systematic reviews and meta-analyses. *Technology, Knowledge and Learning*.

Table 1: *Descriptive characteristics of the 31 review articles*

ID	Author & year	Title of publication (shortened) / Main focus	Samples included	Study designs included	Subject: focus	Learning environment/ technology context			Research themes included					
						Type	Specific focus	Theory	Type of CA- SRL support	Phases & compo- nents	LA/ AI	Effects of CA-SRL support	Moderators	Measure- ment issues
ID1	Alonso-Mencia et al.(2020)	SRL in MOOCs	n.s.	empirical	n.s.	MOOC, OLE	diverse	X	X					X
ID2	Araka et al. (2020)	Measurement and intervention tools for SRL	HE	experimental	n.s.	OLE: LMS, MOOC, PLE	LAD		X		X			X
ID3	Avila et al. (2022)	LA to Support the Provision of Feedback	HE	empirical	n.s.	OLE	LAD	X	X	X	X			X
ID4	Devolder et al. (2012)	Supporting SRL in CBLE	K-12/HE	empirical	STEM	CBLE	scaffolds & prompts		X	X		X	X	
ID5	Du & Hew (2022)	Using recommender systems to promote SRL	n.s.	empirical: trace data	n.s.	OLE: LMS, MOOC, Mobile	recommender systems		X	X		X		X
ID6	Du et al. (2023)	What can online traces tell about students' SRL?	n.s.	empirical	n.s.	OLE: LMS, MOOC	diverse				X			X
ID7	Edisherashvili et al. (2022)	Supporting SRL in distance learning contexts	HE	empirical	n.s.	OLE: LMS, MOOC	diverse		X	X		X		
ID8	Eggers et al. (2021)	SRL strategies in BLE	HE	empirical: interventions	n.s.	BLE, FC, Mobile	diverse		X	X		X		X
ID9	Garcia et al. (2018)	SRL strategies using e-learning tools for Computer Science	educational	n.s.	STEM	OLE, CBLE	diverse		X	X		X		
ID10	Guo (2022)*	Metacognitive prompts to enhance SRL & learning outcomes	educational	experimental & quasi-exper.	n.s.	CBLE	metacognitive prompts		X			X	X	X
ID11	Heikkinen et al. (2023)	Supporting SRL with LA interventions	n.s.	empirical: interventions	n.s.	OLE	LAD		X	X	X	X		
ID12	Hooshyar et al. (2020)	Open learner models in supporting SRL	HE	experimental	n.s.	OLE	LAD/OLM		X	X	X	X		
ID13	Lee et al. (2019)	SRL in MOOCs	n.s.	empirical	n.s.	MOOC	diverse		X			X		
ID14	Matcha et al. (2020)	LAD: a SRL Perspective	educational	empirical	n.s.g	OLE, BLE	LAD	X	X	X	X			X
ID15	Perez-Alvarez et al. (2022)	Tools designed to support SRL in online learning environments	n.s.	n.s.	n.s.	OLE: MOOC, LMS	diverse	X	X	X		X		X
ID16	Saint et al. (2022)	Temporally-focused analytics of SRL	educational & non-ed.	empirical	n.s.	OLE, BLE: MOOC, LMS	diverse	X			X			X

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ID17	Shao et al. (2023)*	Effects of scaffolding on regulation strategies & academic performance	K-12/HE	experimental	n.s.	OLE, CBLE, Mobile	scaffolds & IST		X	X		X		
ID18	Silva et al. (2021)	Regulation of learning interventions in programming education	educational	experimental & quasi-exper.	STEM	CBLE	diverse		X	X		X		
ID19	Silverajah et al. (2022)	SRL in Flipped Classrooms	K-12/HE	empirical	n.s.	BLE, FC, Mobile	diverse		X		X			X
ID20	Stevenson et al. (2017)	Concept mapping technologies to promote SRL	K-12	experimental	STEM	CBLE, Mobile	concept mapping tools		X	X		X		
ID21	Sun et al. (2022)	Influences of differently designed guidance on simulation-based inquiry	K-12/HE	experimental & quasi-exper.	STEM	CBLE	diverse		X			X		
ID22	ter Beek et al. (2018)	Supporting students' reading comprehension in CBLE	secondary school	experimental	Reading	CBLE	scaffolds		X	X		X		
ID23	Valle et al. (2021)	Learner-facing LA dashboards	educational	empirical	n.s.	OLE: LMS, MOOC	LAD		X	X	X			X
ID24	Van Laer & Elen (2017)	Attributes that support self-regulation in BLE	HE	experimental	n.s.	BLE, Mobile	diverse		X			X	X	
ID25	Verschaffel et al. (2019)	Learning Mathematics in Metacognitively Oriented CBLE	K-12	empirical	STEM	CBLE, OLE, BLE	diverse		X			X		
ID26	Viberg et al. (2020)**	SRL and LA in online learning environments	educational & non-ed.	empirical	n.s.	OLE, Mobile	LAD		X	X	X	X		X
ID27	Wong et al. (2019)	Supporting SRL in online learning environments and MOOCs	n.s.	experimental & quasi-exper.	n.s.	MOOC, OLE	prompts, feedback & IST		X			X	X	
ID28	Xu et al. (2023a)**	SRL and academic achievement	educational	empirical	n.s.	OLE, BLE, Mobile	scaffolds, prompts & IST		X	X		X		
ID29	Xu et al. (2023b)*	Efficacy of SRL interventions on academic achievement	K-12/HE	experimental & quasi-exper.	n.s.	OLE, BLE, Mobile	scaffolds, prompts & IST		X	X		X	X	
ID30	Yang & Kortecamp (2020)	Interventions to Enhance Students' Self-Regulation in Online Contexts	HE	experimental & quasi-exper.	n.s.	OLE	diverse		X	X		X		
ID31	Zheng (2016)*	Effectiveness of SRL scaffolds on academic performance	K-12/HE	experimental & quasi-exper.	n.s.	CBLE, OLE, Mobile	scaffolds & prompts		X	X		X	X	

* Meta-analysis

** Systematic scoping review

Abbreviations: n.s.: not specified, OLE: online learning environments, BLE: blended learning environments, CBLE: computer based learning environment, LAD: learning analytics dashboard, Mobile: mobile learning, FC: flipped classroom, CA-SRL support: computer- assisted SRL support, AI: artificial intelligence, IST: integrated support systems, HE: higher education