Researching socially shared regulation in learning

LAK webinar
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In my talk

Our SSRL research agenda and it’s theoretical grounding

Methodological efforts and analysis for understanding SSRL

What we have achieved this far?

Why understanding SSRL is important?
What is critical for learning success in 21st century?

(a) ability to adapt to new situations and challenges and engage in complex problem solving
(b) social skills necessary for communicating and collaborating productively and proficiently,
(c) socio-emotional skills and empathy necessary for tackling challenging problems, and
(d) ability to take initiative set goals and monitor self and others.

A new set of uniquely human skills and competencies that machines cannot match or replicate will be necessary.
Epistemic understanding of active mind(s)

Complex interaction of cognition, motivation, emotion and metacognition

Interaction with individual minds in social context

Brandsford et al. 1999, Greeno, 2006; Pintrich, Marx & Boyle, 1993; Resnick, Levine & Teasley, 1991; Salomon, 1991
“The “social” is not seen as one aspect of the context. Rather, it is seen as an interaction which affects how individual student or a group of students participate in a learning activity.”

Learners can monitor and regulate their learning “experimenting with your learning”

**Metacognition**

scanning internal and external factors - goals and plans
- activating the plans - re-examine to adapt
Learning is a complex process

cognition
motivation
metacognition
affect
emotion
cognition
What is self-regulated learning?
(Winne & Hadwin, 1998; Zimmerman 2010; Järvelä, Hadwin, Malmberg & Miller, 2018)

**Active** and proactive learning

**Process** of learning to monitor, evaluate, and regulate (or change) your own
• Thinking
  • Motivation
  • Emotion
• Behaviour
  • Learning

**Adaptive** process that you develop and refine over time

What is *regulation* in learning?
(Winne & Hadwin; 1998; Hadwin, Järvelä & Miller, 2018; Järvelä & Hadwin, 2014; Järvelä, Hadwin Malmberg & Miller, 2018)

It is a response to *situated challenges* in learning task

Regulation is about *strategic adaption* by individual’s or groups.

It is a *cyclical phenomena* and past experiences contribute to regulation.

*Multifaceted*: cognition, motivation, emotion, behavior

*Task, culture and learning environment* are evolving features
What is *NOT* regulation in learning?

It is not an outcome - It sets a stage for learning and collaboration.

It is not random adaptation, but intentional.

More than coordinated action, interaction, and communication.

It is not knowledge construction.
Collaborative learning

Collaborative and socioemotional interactions, transactions and knowledge building processes have temporal and multidimensional nature which in the optimal cases are successfully shared in between the collaborating partners.

(Kirschner, Sweller, Kirschner & Zambrano, 2018)
We develop theoretical understanding of socially shared regulation in collaborative learning

We study when, how and what makes regulation in collaborative learning functional

We implement our understanding of regulation to utilize advanced learning technologies to support learning
A model of individuals’ SRL cycles
(Winne & Hadwin, 1998)

Socially shared regulation in learning - SSRL

Achieving success in collaborative tasks depends upon:

a) co-constructing shared task representations, shared goals, and shared strategies

b) regulating learning through shared metacognitive monitoring and control of cognition, motivation, emotion and behavior

Cognitive and non-cognitive processes

Temporality

SRL, coRL, SSRL

Individuals and individuals in group

No metrics to measure?
Methodological efforts for understanding SSRL
Our studies
Temporality

Patterns

Interaction of cognitive and non-cognitive processes

Contextual affordances

"Sharing" interaction in a metacognitive level


Multimodal data collection

- 360-degree video capture + audio
- Mobile eye tracking
- Multisensor devices that track student physiological activation
- Logdata, situated questionnaires, evaluation forms, student products
What we have achieved in understanding SSRL this far?
1. Why regulation is important in collaborative learning?

Regulation is critical for the progress of collaborative learning (Järvelä et al., 2016).

Regulation is situated in group interaction. (Isohätälä, Näykki & Järvelä, 2019; Kurki et al, 2019)

Regulation can be targeted on cognitive, emotional and motivational processes. (Järvenoja, Näykki, Törmänen & Järvelä, 2019)
2. How regulation occurs in collaborative learning

Challenges in groups are triggers to activate regulation (Järvenoja, Näykki, Törmänen & Järvelä, 2019)

Metacognitive awareness is required to recognize regulation need (Sobocinski et al., 2020).

Regulation is manifested in individual and group level (Dindar et al., 2020).

Interaction, behavior and physiological activations can indicate the conditions for regulation in collaborative learning (Haataja, Malmberg, & Järvelä, 2018; Malmberg, Fincham, Pijeira-Díaz, Järvelä & Gasevic, 2019).
When students monitor learning together, they tend to synchronize physiologically with each other.

Emotionally relevant situations in group call for emotion regulation
- the observed emotional reactions (video) and physiological reactions (EDA) in CL

What follows socially shared monitoring?

Physiological state transitions discovered by machine learning methods are more frequent in sessions when groups are on-track and there is a low need for regulation.

3. How regulation can be supported for collaborative learning

Pedagogical designs and technological tools (Järvelä et al., 2016; Järvenoja et al., 2020) for:

- Increasing awareness of collaborative learning process
- Prompting use of regulation strategies
- Give learning process feedback for teachers and learners

Multidisciplinary efforts for AI support
(Järvelä, Järvelä, S., Gasevic, D., Seppänen, T., Pechenizkyi, 2020)
SSRL & LA ?
The learning sciences help us understand human learning processes.

SRL, CoRL, and SSRL theories help us understand the strategic regulation of those processes in learning.

LA helps to understand mechanisms of regulation and provide targeted support when needed.
Data’s correspondence to observed events

Humans are agentic, interpretive and use situated resources (physical, symbolic, social)

Patterns, sequences, regularities, causalities, models...

Järvelä & Bannert (Eds.) (2019). Temporal and adaptive processes of regulated learning - what can multimodal data tell? Special issue in Learning and Instruction
SSRL multimodal process data channels
- what data can reflect what event?

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Why understanding SSRL is important?
Theory building

New data modalities, traces and representations of cognition, motivation, emotion and metacognition to explain mechanisms of regulation in learning

What multimodal data can tell us about the students’ regulation of their learning process?

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Practical support provides learners "on the fly" support when needed.
Generation Z and beyond: Co-evolution of human capabilities and intelligent technologies in the 21st century

How human scientists can participate co-evolution of human capabilities and intelligent technologies

How humans react to and use new technologies?
“Thinking Tomorrow’s Education and helping tomorrow’s learners”

Algorithms don’t regulate people – we have to help people to regulate themselves
What if the digital future was not driven by
digital technologies but by humans?

https://www.youtube.com/watch?reload=9&v=wUvTEFvABs
Thank You

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