*Shared Metacognition

Development of the Construct & Questionnaire

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April 1. 2015

*Introduction

*Phase I – Traditional MC Construct

*Phase II – Shared MC Construct and Validation

*Future Directions

*Outline

What brings you to this webinar on metacognition?

Interests??

*A case study how original research evolves; a description of an exploratory journey.

*Documented by three articles that describe how the research evolved based on results at each stage.

*Introduction

* *Garrison, D. R., & Akyol, Z. (2015). Developing a shared metacognition construct and instrument: Conceptualizing and assessing metacognition in a community of inquiry*. Internet and Higher Education, 24, 66-71.*

  * Note that this was published under title "Toward the development of a metacognition construct for the community of inquiry framework"

* *Garrison, D. R., & Akyol, Z. (2013). Toward the development of a metacognition construct for the community of inquiry framework. Internet and Higher Education, 17, 84-89.*

* *Akyol, Z., & Garrison, D. R. (2011). Assessing metacognition in an online community of inquiry. Internet & Higher Education, 14(3), 183-190.*

* **MC References**

*The overarching purpose was to understand how students demonstrate metacognition during discourse in an online learning environment.

*The primary goal was to develop and validate a metacognitive construct grounded in the educational psychology literature.

* **Our Goals**

*Phase I

Metacognition		
Knowledge of Inquiry (KI) (Entering Knowledge/Motivation)	**Monitoring of Cognition (MC)** (Task Knowledge/Monitoring)	**Regulation of Cognition (RC)** (Strategies/Management)

Pre-Task Metacognitive State
 	
• Expressing knowledge of critical thinking and problem solving
• Expressing self as a learner
• Expressing entering motivational state
• Assessing discipline knowledge
	Reflection on Action
	
	• Declarative; judging
	• Asking questions for confirmation of understanding
	• Commenting about self's and others' understanding
	• Commenting on or making judgments about the strategy applied
	• Asking questions about progression or stalling
		Reflection in Action
		
		• Procedural; planning
		• Setting goals
		• Applying strategies
		  o Providing/asking for support
		  o Asking questions for deepening thinking
		  o Asking for clarification
		• Questioning progression

Akyol & Garrison (2011)

*Qualitative Study

	Number of messages	Metacognition		
		Knowledge of Cognition	Monitoring of Cognition	Regulation of Cognition
Discussion Week 1	53	39.6 %	35.8 %	41.5 %
Discussion Week 5	82	36.6 %	59.8 %	51.2 %
Discussion Week 9	76	22.4 %	56.6 %	60.5 %

Frequency of Metacognition in Online Discussions

*Quantitative Study

*We were able to distinguish monitoring and regulation of cognition, but …

*We were NOT able to distinguish knowledge of cognition (KC).

*The third factor was best interpreted as reflecting the socially situated nature of the learning environment; this factor we interpreted as co-regulation.

*FA Results

*There is often a mismatch between the theoretical models of metacognition and the empirical data *(Pintrich, Wolters, & Baxter, 2000)*.

*Validating a theoretical metacognitive construct through the qualitative analysis of a transcript is very different from a quantitative snap-shot of a construct at a particular point in time.

*Limitations

*The results strongly indicated that a metacognitive construct in a community of inquiry needs to reflect both individual and shared learning activities.

*The significant insight of the first phase of this research was the need to explicitly recognize **co-regulation** of metacognition.

*Conclusion – Phase I

*Phase II

Construct Development

Within a learning community, only through co-regulation (discourse, critique, negotiation) can self-regulation be fully realized.

(Garrison & Akyol, 2013)

*MC in a CoI

A key mechanism in improving metacognition is the ability to observe and listen to other perspectives.

(Lajoie & Lu, 2012)

* *Co-Regulation*

Metacognition is conceived as having both self and co-regulated functions, each of which include monitoring (reflective awareness) and managing (strategic action) cognitive and teaching responsibilities.

*MC Defined

A pilot study of the 54 item questionnaire collected data from 167 participants.

*The data analysis confirmed the theoretical construct and provided information for revision of the questionnaire items.

* Pilot Study

Based on the magnitude of factor loadings, absence of multiple loading, and respondent feedback the number of items were reduced from 54 to 26 and several items were reworded.

*Final Questionnaire

Shared Metacognition Items

SELF-REGULATION: When I am engaged in the learning process as an individual

1: I am aware of my effort
2: I am aware of my thinking
3: I know my level of motivation
4: I question my thoughts
5: I make judgments about the difficulty of a problem
6: I am aware of my existing knowledge
7: I am aware of my level of learning
8: I assess my understanding
9: I change my strategy when I need to
10: I search for new strategies when needed
11: I apply strategies
12: I assess how I approach the problem
13: I assess my strategies

Items 1-7 monitoring; Items 8-13 managing

CO-REGULATION: When I am engaged in the learning process as a member of a group

1: *I pay attention to the ideas of others*
2: *I listen to the comments of others*
3: *I consider the feedback of others*
4: *I reflect upon the comments of others*
5: *I observe the strategies of others*
6: *I observe how others are doing*
7: *I look for confirmation of my understanding from others*
8: *I request information from others*
9: *I respond to the contributions that others make*
10: *I challenge the strategies of others*
11: *I challenge the perspectives of others*
12: *I help the learning of others*
13: *I monitor the learning of others*

Items 1-6 monitoring; Items 7-13 managing

*To move this research forward we could use your help!

*Please encourage your **graduate** students to complete the MC survey at:

*https://www.surveymonkey.com/s/27NWBZF

Contribute to Next Phase?

*Results

Exploratory Factor Analysis

*A two factor analysis was applied.

*The results confirmed the theoretical structure of self and co-regulation of cognition.

*Two Factor Solution

Two Factor Rotated Component Matrix

Items	1	2
SR11	.867	
SR10	.862	
SR9	.850	
SR13	.841	
SR6	.809	
SR2	.794	
SR12	.785	
SR8	.766	
SR7	.766	
SR3	.738	
SR1	.732	
SR5	.684	
SR4	.634	
CR7		.794
CR8		.794
CR2		.755
CR6		.753
CR4		.731
CR5		.690
CR9		.677
CR3		.673
CR13		.581
CR1		.522
CR10		.522
CR12		.502
CR11		.463

*An exploratory four factor analysis was conducted.

*Unfortunately, it was difficult to interpret the monitoring and managing sub-elements of self and co-regulation.

*Four Factor Solution

*_This research found that female students had higher co-regulation compared to male students._

*_Another study that found teams with more women outperformed teams with more men_ (Woolley, Malone & Chabris, 2015).

* Gender

*Future Research

*Integrate shared metacognition into a comprehensive theoretical framework.*

*MC and CoI

It is interesting to note that "metacognitive presence correlated significantly with cognitive presence and students' teaching presence"

(Weerasinghe, Ramberg, & Hewagamage, 2012)

*Promise

Metacognition is a complex mix of cognitive presence and teaching presence elements.

* **MC and the Col**
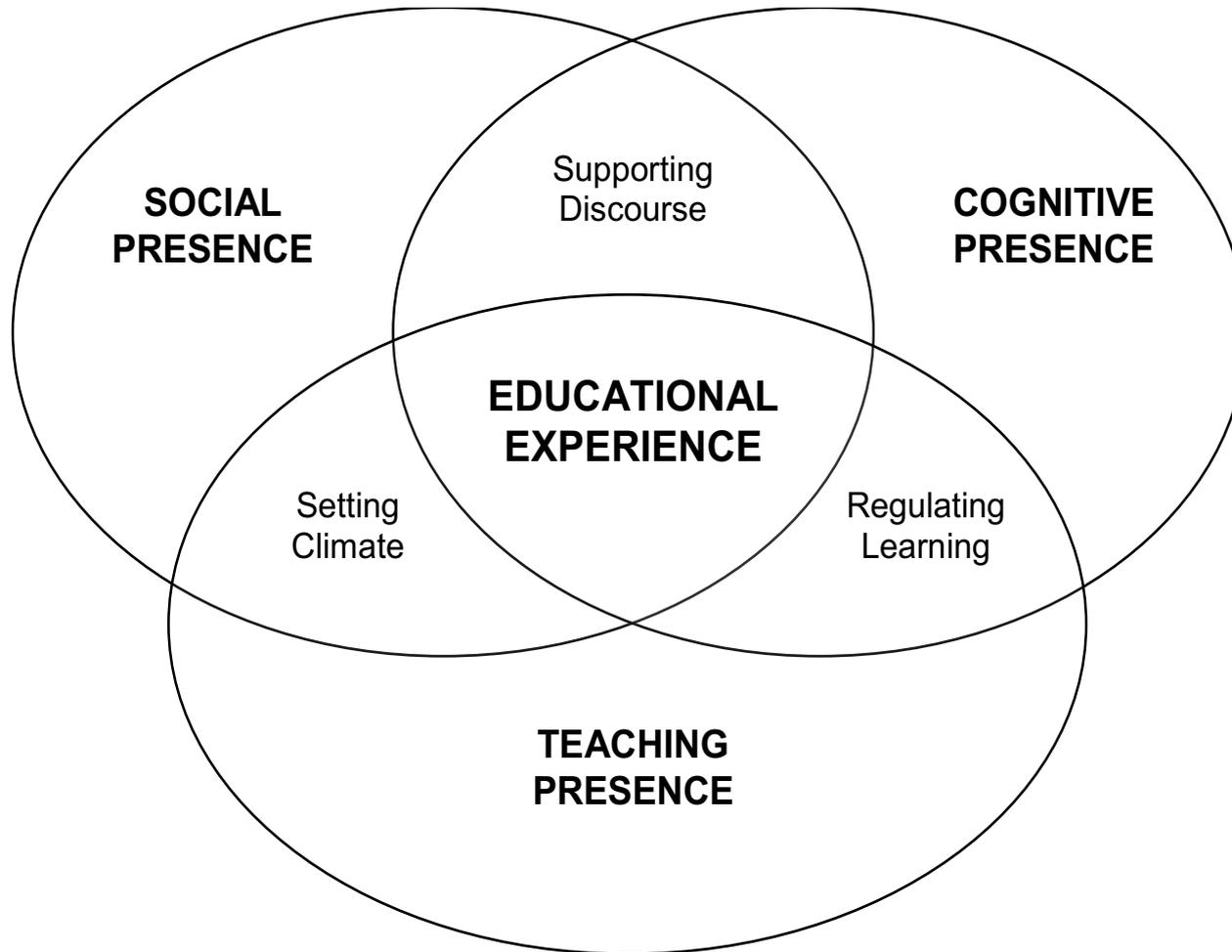
Community of Inquiry Framework

* *Use the MC and CoI instruments to explore relationships among MC, TP and CP.*

* *Explore the development of metacognition over time (eg, how does self and co-regulation ebb and flow?).*

* *Explore SP and MC (eg, how does social interaction affect co-regulation?)*

* Other Questions

Metacognitive development also means understanding the inquiry process (knowledge of cognition).

* **Knowledge of Cognition**

Having a clear understanding of self and co-regulation and its role in collaborative inquiry will lead to developing strategies that can effectively support deep and meaningful approaches to learning.

*Conclusion

*QUESTIONS??

FEEDBACK