

Regulation of Teaching as an Individual or Collaborative Process: Theory Meets Practice

Gaoxia Zhu (co-chair), Nanyang Technological University, gaoxia.zhu@nie.edu.sg

Martin Greisel (co-chair), University of Augsburg, martin.greisel@uni-a.de

Regina Hegele, Parkschule Stadtbergen, hegele@t-online.de

Heidrun Printz, Dr.-Max-Josef-Metzger-Schule, hprintz@rsmeitingen.org

Jenny Melo León, Gimnasio La Montaña, jennymelo@glm.edu.co

Laura Calzado, Dolors Monserdà-Santapau school, lcalzado@xtec.cat

Raadiyah Nazeem, Dr. Eric Jackman Institute of Child Study, raadiyah.nazeem@utoronto.ca

Marcela Borge (discussant), Pennsylvania State University, mbs15@psu.edu

Chew Lee Teo (discussant), Nanyang Technological University, chewlee.teo@nie.edu.sg

Mercè Bernaus (discussant), Autonomous University of Barcelona, merce.bernaus@gmail.com

Abstract: There are calls for researchers and practitioners to build joint communities to narrow down research-practice gaps. Regulation of teaching, a process during which teachers direct attention, set goals, plan, monitor and evaluate their teaching for improvement, is very likely to benefit from communication and collaboration between researchers and teachers given its complexity in terms of multiple phases and various levels. This symposium aims to facilitate researchers' and practitioners' direct conversations on self-, co-, or socially shared teaching regulation. A theoretical framework that details different phases of teaching regulation at the self-, co-, or socially shared teaching levels guides teachers' reflections on their teaching regulation, which then serve as a basis for a panel discussion between three (groups of) teachers and three invited researchers. The panel discussion will be focused on identifying practical challenges and research gaps regarding teaching regulation and discussing how teacher and researcher communities can collaboratively respond to these issues.

The overall focus of the symposium

There is an abundance of research on teaching and learning in the field of Learning Sciences. However, the research does not extensively impact teaching practice, which is referred to as research-practice gap (Chi, 2021). The gap between research and practice may be attributed to the following reasons: teachers perceive the questions addressed by researchers irrelevant to their practice; researchers' work is not very accessible to teachers because of writing style and subscription issues; teachers lack time to read research findings; and research-based knowledge may be too general and abstract but not specific enough (Chi, 2021); what works in research may not be effective in local practice (Joyce & Cartwright, 2020). To address these issues, researchers and practitioners should build joint communities that include research and practical focus (Korthagen, 2007), and negotiate problems of practice (Coburn & Penuel, 2016). Despite this call, at our conferences, researchers still mostly communicate with other researchers, while teachers are rarely involved in the discussions.

Among many topics, regulation of teaching might benefit from conversations between teachers and researchers. In practice, teachers often need to revise their teaching practice in order to improve the effectiveness of lesson plans or to respond to the evolving learning theories and changing societal values and structures (Butler et al., 2004). This necessitates teachers to engage in regulative teaching practice, a process during which they apply a variety of activities and strategies to direct attention, set goals, plan, monitor and evaluate their teaching to improve it (Lindblom-Ylänne et al., 2011; Ukrop et al., 2019). However, there lacks specific advice or rules on the process of regulation that teachers can follow. Furthermore, teachers can regulate their teaching practice as self-, co-, or socially shared endeavors. Both make teaching regulation complex and challenging. On the other hand, there is a rich body of research literature on teaching and regulation that can be made better use of to support teachers.

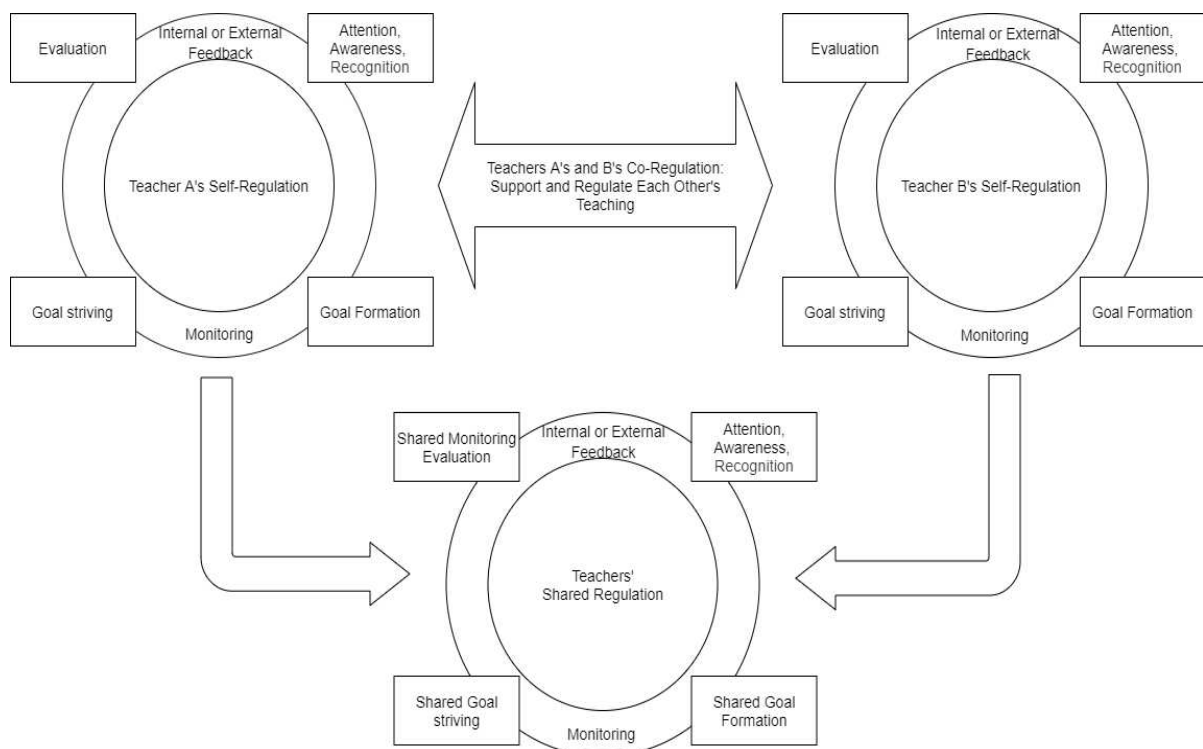
For these reasons, this symposium aims to create an opportunity for researchers and practitioners to have direct conversations on self-, co-, or socially shared teaching regulation. To scaffold the discussion, we provide (a) a theoretical framework that details different phases of self-, co-, or socially shared teaching regulation to guide teachers' reflections on their regulation experiences; (b) reports from three (groups of) teachers on their teaching regulation, which can serve as a basis for discussions. At the conference, the three (groups of) teachers will discuss their practical challenges regarding teaching regulation, and the panel will identify research gaps in

the field. Then the teachers and researchers will discuss how to bridge and address the practical challenges and research gaps in a feasible and collaborative manner.

Here, we first elaborate on self-, co-, or socially shared regulation. Self-regulation is an individual activity in which individuals plan, enact, monitor and adjust their learning using cognitive and behavioral strategies (Zimmerman & Moylan, 2009). Co-regulation processes are directed to influence the behavior, cognition, and motivation of one specific group member (Grau & Whitebread, 2012). Teachers' co-regulation involves other people such as teacher trainers, advisors, or fellow teachers supporting certain processes of the regulation (Hadwin et al., 2018) and can happen in daily school practice, during school meetings or at professional development activities. Socially shared regulation (SSR) emerges when teachers negotiate their goals, plans, and strategies concerning shared tasks and maintain positive interactions by listening and considering each other's ideas (Hadwin et al., 2018; Malmberg et al., 2015). In SSR, teachers identify shared teaching problems, set shared goals, integrate different knowledge and ideas, and evaluate the process as a group or community (Hadwin et al., 2018). Relating the concepts, self-regulation is the basis of co- and shared- regulation. Compared to co-regulation, SSR emphasizes that a group, as a unit, shares convergent regulation of the team activities, cognition, motivation, emotion, and behavior (Hadwin et al., 2011).

Figure 1

Phases of regulation of teaching at the self-, co- and shared levels



We integrated Järvelä and Hadwin's (2013) socially shared regulated learning model, Borge et al.'s (2018) model of regulatory processes during collaboration, and Nesbit's (2012) self-directed leadership-development framework, constructed a teaching regulation model (see Figure 1), and applied it to the teachers' regulation context. This model specifies four cyclical phases and relevant executed processes in each phase. During Phase 1, a teacher or a group of teachers directs their attention to a specific topic that they are interested in or a specific teaching process that they want to improve because of their beliefs, motivation, or internal or external feedback. In Phase 2, teachers usually form their teaching goals. During Phase 3, goal striving, teachers make efforts and commitment to implement task strategies to achieve goals. This phase is followed by evaluation (i.e., Phase 4) in which teachers reflect on the affective and cognitive consequences of their performance. This phase is usually facilitated by internal feedback arising from one's self-observation (Kolb, 1984) or external feedback from other stakeholders (Ryan et al., 2000). This phase usually circles back to forethought phases. Each phase is accompanied by monitoring to ensure that the aim and function of each phase is sufficiently fulfilled, according to teachers' standards (Winne & Hadwin, 1998).

The four phases of self-, co- and shared regulation are influenced by internal cognitive conditions and external task conditions (Winne & Hadwin, 1998). Internal conditions such as (a) specific knowledge or skills, (b) beliefs, and (c) motivation influence the regulation process. Teachers' knowledge about the context (e.g., students involved; the history of the teaching situation) and skills in integrating different pieces of knowledge plays a crucial role in the regulation process. Moreover, teachers hold beliefs about how knowledge is acquired (Chinn, 2014) and have specific teaching philosophies, which guide them to develop goals and options for action. Goals and action plans are affected by intrinsic and extrinsic motivational incentives. For example, some teachers may be intrinsically motivated to continually improve their teaching while some may be mainly motivated by extrinsic reasons such as demonstrating good teaching performance to principals and colleagues. Furthermore, teachers' regulation processes depend on the availability of external knowledge resources such as literature, social media, and direct personal interactions with fellow teachers. In addition, time constraints limit how extensively teachers may regulate.

Overarching/integrative points that will be addressed by teachers and researchers

The theoretical model described above can help pinpoint, differentiate, and organize teachers' teaching regulation experiences. However, due to lack of research on teaching regulation (Lindblom-Ylänne et al., 2011), it is yet unclear whether and how teachers self-, co-, or socially shared regulate their teaching practice and how to foster their regulation. To better bridge the gaps between practice and research, we create opportunities for practitioners and researchers to identify and reflect on practical and research challenges concerning teaching regulation, and negotiate and co-design feasible solutions to address the issues. Practitioners and researchers will work together at the symposium as follows:

First, three (groups of) teacher experts have shared their regulation practices (e.g., regulation experience, desired goals, gaps and challenges, and support needed) at the self-, co-, and shared-regulation levels, separately. The above-described regulation model informed and structured teachers' reports of their experiences.

Second, these reports will be shared with three researchers from complementary fields ahead of time. Researchers will look at teachers' successful and challenging regulation experiences with scrutiny from their perspectives of expertise. We will request the research panelists to connect research gaps and the practical challenges that teachers face, and invite researchers to draft potential solutions to fill these gaps.

Third, at the conference, teachers and researchers will discuss the feasibility and potential impact of the solutions, and co-design to detail the solutions.

The significance of the contributions

Direct conversations between teachers and researchers benefit both sides. For teachers, the symposium may improve their awareness of the importance of teaching regulation and understanding of regulation procedures and types, and encourage them to take actions in the future. From the perspective of researchers, the symposium tends to help them better understand the practical challenges that teachers face and how they may co-design research with teachers. Taken together, this symposium will serve as a step to better identify practical and theoretical challenges in teaching regulation, and better connect teachers and researchers to respond to the challenges (which is mentioned in the Regulation Experiences of Teacher Experts 3).

Structure of the session

This symposium will include three teacher presentations on their self-, co-, and shared-regulation experiences concerning teaching, respectively, followed by a panel discussion between teachers and researchers on how to better support teaching regulation. We will adopt the following session organization:

1. Welcome and theoretical introduction by session chairs (6 min)
2. Teachers' presentation on self-regulation of teaching (8 min)
3. Teachers' presentation on co-regulation of teaching (8 min)
4. Teachers' presentation on shared-regulation of teaching (8 min)
5. Researchers analyze teachers' experiences, identify research gaps, and propose future research directions to promote positive changes in teaching regulation (24 min)
6. Open discussions between teachers, researchers, and audiences on how to respond to the practical and theoretical challenges on teaching regulation, and the feasibility of researchers' proposals (26 min)

Regulation experiences of teacher expert 1: Self-regulation

Regina Hegele, Parkschule Stadtbergen

Planning, implementation and reflection of lessons

In everyday school life, the choice of content covered in class depends largely on agreements within the colleagues of a grade level, the learning situation (homeschooling or face-to-face teaching), and the textbooks used.

After the contents of the upcoming lesson sequences have been determined in the team, I develop sequence plans that include the contents of the individual teaching units, the competencies to be achieved, learning opportunities and their realization. Here, it is also important to consider where the children might encounter obstacles that are not manageable for them. Furthermore, as far as possible, I attempt to address questions that are currently arising in the class and, if necessary, to include them in the lesson planning. However, this can also happen during the sequence because some questions only arise from the joint work.

Whether a designed unit can be successfully implemented in the classroom depends on many different aspects, not all of which can be planned in advance. However, for a favorable outcome, it is imperative that I keep the learning structure of the class in mind. In my opinion, this includes the performance spectrum of the class (strong and weaker students), the usual forms of work in the class (such as think, pair, share, group work), a positive classroom atmosphere, adherence to the agreed-upon rules of conversation, and the motivation of the learning group. Factors that cannot be planned are already existing knowledge about the chosen content (which, however, can also be integrated spontaneously) or possible short-term events within the class (disputes or other differences).

Reflection on lessons usually happens very briefly and unbureaucratically in everyday life. As a rule, I do not analyze further any units that go as planned when I have gained the impression, while reflecting with the children on the content which we worked on, that the children were able to use the learning opportunities. If this is not the case, I consider at which points the children had difficulties and how these could have been eliminated. After identifying the “stumbling blocks”, I note them briefly, which will be useful when re-using the content. Unfortunately, teachers rarely receive external feedback, as there are currently no models for peer coaching in my state, and as the assessment by the school management, which takes place every four years, is not useful for this purpose.

In order to further develop my own teaching in the interests of the children, I am in close exchange with my colleagues: I hear how they prepare content didactically and what methods they have been successful with and compare this information with my work. We also plan various lesson sequences together and benefit from the experiences and ideas of the team. On the other hand, I regularly attend further training courses, have contact with the university and thus always try to be up to date.

Conditions for optimal lesson planning, implementation and reflection

- Lesson planning: Teachers must be motivated to teach new content to their students. They should have the necessary expertise and have their students in mind.
- Lesson implementation: Small learning groups (maximum 22 students), a warm learning climate, students have skills necessary for successful learning (listening with understanding, ability to work in teams, positive attitude towards learning and achievement)
- Lesson reflection: sufficient time, models that enable joint reflection (e.g., peer coaching)

Challenges in lesson planning, teaching, and reflection

In my eyes, one of the greatest challenges in planning, implementing, and reflecting on lessons is the fact that we have to teach classes that are far too large (sometimes up to 29 students in elementary school), with a very heterogeneous structure in terms of performance (children with disabilities, children with increased special educational needs, children with varying degrees of language deficits). It seems almost impossible to do justice to all the children. In addition, there are more and more "administrative activities" that we teachers have to take on during our working hours. Unfortunately, the resulting time deficits cannot always be compensated for by extra work and additional commitment.

Support for optimal lesson planning, teaching, and reflection

Basically, this point follows from my previous remarks. In my opinion, the following factors would be beneficial: a reduction in class sizes, additional pedagogical staff to support teaching, and a reduction in the number of hours per week for primary school teachers because the workload is very high in full-time teaching and it cannot be ruled out that the quality of teaching will suffer in the long term.

Regulation experiences of teacher expert 2: Co-regulation

Heidrun Printz, Dr.-Max-Josef-Metzger-Schule

How do you give teacher trainees optimum support in designing and reflecting on their teaching?

Effective and lasting support for young teachers will be more necessary than ever in the coming years in order to meet and withstand the changing demands on schools. Ideally, this support should be designed as follows:

The basis for a good start in the teaching profession is mutual trust, willingness and curiosity in learning as well as enjoyment in working with people. Up until their first lesson, teacher trainers attend my lessons to observe, evaluate, discuss and assess certain methods and didactic focuses. For this purpose, these criteria are visualized on a lesson plan. Reflection on lesson observation in this initial training phase is crucial. At this stage of their careers, the complexity of teaching should only be demonstrated very gradually so that the trainee teachers do not feel insecure and also to make them aware that they are allowed to make mistakes.

When planning their own lessons, I allow the trainee teachers to choose their own area of interest in order to promote self-activity and increase intrinsic motivation. A lesson matrix also enables the trainees to reflect on the correct location and design of certain learning phases. The learning goal-oriented action is stimulated by the external or own definition of a minimum learning gain. Even when they are already in the planning phase, I always remind them of pedagogical-psychological and social characteristics and of the pupils' level. If they take the characteristics of the addressees into account, then the learning objectives can be achieved.

In the teacher training college, I encourage discussion about interests, learning content and learning goals as well as learning methods. This supports the development of skill in their particular subject and their teamwork abilities. It also contributes to the development of the teacher's personality by being self-reflective and reflecting upon others.

While the trainees are teaching, I support as much as necessary and as little as possible. I only intervene in the trainees' lessons when there is potential danger, for example in Physical Education. Ideally, I expect the trainees to reflect on their lessons. For example, by introducing a topic in different classes or grades, the trainees realize that there is never just one correct solution pattern.

In the post-lesson discussion with the trainee alone or in the trainee group, I believe it is very important to address and explain the skills necessary for educational and subject-specific action objectively and constructively. I limit my feedback to three main aspects for further development. The feedback on their lesson and what they should be aiming for is communicated in an appreciative and honest manner. It is tailored to each individual trainee's level of teaching and contains practical solutions and suggestions for improvement. In choosing the timing of the trainee's feedback I take their timetable, mental and physical state into account to ensure a productive reflection of their lesson. In addition to the post-lesson feedback sessions, I also comment on the trainees' lesson plans and hand them back at a suitable time. A video recording of the lesson and subsequent discussion of it often provides valuable insight for the trainee and can be an excellent way of observing the interaction between teacher and pupil.

Which conditions do you require to provide optimal supervision for teacher trainees?

A core condition for the optimal supervision of trainees by teacher trainers is up-to-date, well-founded and professional competence combined with curiosity. In addition, it is advantageous if the teacher trainer has a sound knowledge of human nature and a broad range of experience in school, based on the enjoyment of educational and creative activities. The college workload can be reduced by having good organizational conditions, e.g., a teaching timetable which leaves enough room in the college timetable for effective teacher training and study. The technical equipment (e.g., media, subject-specific materials) also has a noticeable effect on the quality of the training. Co-operations with other educational institutions complement and reinforce the objectives of the training at the school and also give the trainees the opportunity to network. They demonstrate that schools are constantly evolving.

What challenges get in the way of your supervision?

I find school days very challenging when plans are changed at short notice, making it necessary to cancel appointments. However, it is also challenging when there are too many appointments: this disturbs intensive, close exchange in the college setting. Progress is negatively affected when trainees can't work well in a team, if they are not honest with each other and also if they demonstrate excessively competitive behavior.

What support do you require to optimize scaffolding teacher trainees?

Important building blocks for optimal teacher training are, on the one hand, solid support and complete trust from the training supervisor and the specific subject mentor. On the other hand, cooperation, exchange and constructive criticism by the college staff are beneficial. Participation in further training, access to an up-to-date specialist library, and excellent supervision and psychological backup in critical situations as support for self-reflection have a positive effect on the teacher training.

Regulation experiences of teacher experts 3: Socially shared-regulation

Jenny Melo León, Gimnasio La Montaña
Laura Calzado, Dolors Monserdà-Santapau school
Raadiyah Nazeem, Dr. Eric Jackman Institute of Child Study

How do you collaboratively identify your shared interests and goals?

There is always somebody who suggests a topic and then we discuss the topic and see how we can put it into practice. In this current project, our colleague Raadiyah from Toronto said that discussing what a community is could be interesting, and we immediately agreed. It has been fantastic because we have the same shared ideas or shared interest in developing something basic in our class, which is understanding what a community means and what their roles are in the community. In the current project, Jenny, who likes to meet teachers with the same interests, was invited to join the community project. She liked it and worked to fit it into her curriculum. Through a previous project, Jenny and Laura worked together for two years. They were first introduced by Mercè and then joined by the big idea of developing awareness towards Sustainable Development Goals, which are important for their students in Colombia and Spain. Regarding choosing specific global goals to work on, they chose gender equality, specifically, responsibilities at home that can differ from their responsibilities at school. Students also compared their parents' and their grandparents' household responsibilities in order to see if there were gender differences between mothers/grandmothers and fathers/grandfathers. Mercè helped Laura and Jenny through the project.

How do you design to respond to your shared interests or specific goals?

The first thing we did was to create a shared document where we can provide ideas, record our next steps, and have the meeting dates and time. Shared documents help us develop the project step by step, record concrete ideas, and build or design collaboration. Second, we have in mind that we should not stop learning or improving our teaching; rather, we need to make changes whenever it is needed. Third, we have to take some time to meet and discuss how things are going on, not only in the working hours, but also during our own time.

How do you know whether your designs are well implemented in classrooms?

We have a Google Doc where the goals and activities are described. Sometimes we have video conferences to share what students produced, and then we know exactly how the design has been implemented in the classrooms. For instance, in the gender equality and responsibilities at home project mentioned above, Jenny and her students created a mathematics table with Steven balls, while Laura's students created a mathematical table but with numbers and colors. There were two different ways of doing the same visual representations. Laura learned from Jenny's way and presented it to her students. During the implementation, they have to be very flexible because things may need to be changed due to time constraints or according to students' products.

How do you negotiate with your design partners to move forward or improve your teaching?

When we have clear goals, it is easy to negotiate what you're going to do. Having or establishing desired goals at the beginning is very important for the project. Our goals are about promoting students' authentic experiences to communicate with people around the world and let them explore differences and similarities in our cultures. Even though we cannot be in presence, we can take advantage of these technological tools to get in touch with people. No matter what we do with our students and what their products are, it is important that we contribute to the goals. Furthermore, we have to be very flexible and understand that another partner may need more time or does it in a different way. Because we must discuss with the other partners, our teaching can be improved through these international projects.

Which are the conditions that make your collaborative design, teaching, and reflection possible?

Even if we do not have the physical or time conditions, etc., as we are motivated to work together, see the project clearly and we like teaching, that's the reason why we are here. Furthermore, today the world is global, so we cannot teach just in our class. We have to teach with others and to see what they think about. The international project in a second language makes what the students do more realistic and meaningful. Finally, having support from the school authorization and principals and knowing their interests in promoting these projects make things possible and easier.

Which are some challenges, if any, that hinder your collaborative design, teaching, and reflection?

In the past projects, lacking time was a permanent issue. We had many things that we wanted to do. We planned it in a way and then we had to modify it either because we needed more time to develop this specific part of the project, or students responded in a way that we thought was not very adequate, or what we planned was not really what our students needed. Still in the pandemic, we have more demands at school with the curriculum, so it is becoming harder.

What support do you need to optimize your design, teaching, and reflection?

We need collaboration. It is very important to have somebody supporting us from outside, support in general from the university. The collaboration between schools and universities should be more frequent. Researchers at universities want to improve teaching, we as teachers want to improve our teaching as well. Researchers have new theories and we have teaching experiences, so we should collaborate much more closely. In particular, we need more support on methodologies for projects, how to develop projects and how to better handle each project. Interactions between universities and schools, between experts and people working at schools are fantastic.

In the three reports on self-, co-, and shared-regulation of teaching, some common themes such as collaboration with colleagues and researchers at universities, limited time issue, or teachers' motivation emerged. Further interpretations and discussions will be made at the conference by the panelist, including teachers and researchers.

Invited panelists: Areas of expertise and reasons for participation

Dr. Marcela Borge, Associate Professor of Education (Learning, Design, and Technology), Pennsylvania State University. Dr. Borge's research expertise includes but is not limited to technology supported self-regulated learning, socio-metacognition, design-based research methods, and computer-supported collaborative learning (CSCL). The model of regulatory processes during collaboration constructed by Dr. Borge in her article Learning to monitor and regulate collective thinking processes informed the integration of the regulation of teaching model shown in Figure 1.

Dr. Chew Lee Teo, Senior Research Scientist, National Institute of Education (NIE), Nanyang Technological University. Dr. Teo founded the Knowledge Building Community-Singapore and has led the local and international Knowledge Building Community Network Learning (KBC-NL) series. The KBC-NL brings together teachers and researchers to explore germane issues on 21st century competencies and pedagogies. The KBC-NL sessions have reached out to more than 1000 teachers and researchers. Recently, Dr. Teo and her team have gathered about 200 students and teachers to work on the theme of "Saving Lives, Saving Planet" in Knowledge Building Design Studios.

Dr. Mercè Bernaus, Emeritus Professor, Autonomous University of Barcelona. Dr. Bernaus has rich experiences working as a teacher, researcher, and Ministry of Education officer. She specifically focuses on second language learning and language awareness. For instance, in the Linguistically Sensitive Teaching in All Classrooms Project, Dr. Bernaus and other researchers develop, test and evaluate a reflection tool to help future and in-service teachers become more linguistically sensitive in their teaching, thoughts and attitudes. Dr. Bernaus has long-term collaboration with the invited teachers who will talk about socially shared regulation of teaching.

References

- Borge, M., Ong, Y. S., & Rosé, C. P. (2018). Learning to monitor and regulate collective thinking processes. *International Journal of Computer-Supported Collaborative Learning*, 13(1), 61–92. <https://doi.org/10.1007/s11412-018-9270-5>
- Butler, D. L., Lauscher, H. N., Jarvis-Selinger, S., & Beckingham, B. (2004). Collaboration and self-regulation in teachers' professional development. *Teaching and teacher education*, 20(5), 435–455.
- Chi, M. T. (2021). Translating a theory of active learning: An attempt to close the research-practice gap in education. *Topics in Cognitive Science*, 13(3), 441–463. <https://doi.org/10.1111/tops.12539>
- Chinn, C. A., Rinehart, R. W., & Buckland, L. A. (2014). Epistemic cognition and evaluating information: Applying the AIR model of epistemic cognition. In D. N. Rapp & J. L. G. Braasch (Eds.), *Processing Inaccurate Information: Theoretical and Applied Perspectives From Cognitive Science and the Educational Sciences* (pp. 425–453). MIT Press.
- Coburn, C. E., & Penuel, W. R. (2016). Research–practice partnerships in education: Outcomes, dynamics, and open questions. *Educational Researcher*, 45(1), 48–54. <https://doi.org/10.3102/0013189X16631750>
- Grau, V., & Whitebread, D. (2012). Self and social regulation of learning during collaborative activities in the classroom: The interplay of individual and group cognition. *Learning and Instruction*, 22(6), 401–412. <https://doi.org/10.1016/j.learninstruc.2012.03.003>
- Hadwin, A. F., Järvelä, S., & Miller, M. (2011). Self-regulated, co-regulated and socially shared regulation of learning. In D. H. Schunk & B. Zimmerman (Eds.), *Handbook of Self-Regulation of Learning and Performance* (pp. 65–84). Taylor & Francis.
- Hadwin, A. F., Järvelä, S., & Miller, M. (2018). Self-regulation, co-regulation, and shared regulation in collaborative learning environments. In *Handbook of self-regulation of learning and performance, 2nd ed* (pp. 83–106). Routledge/Taylor & Francis Group.
- Järvelä, S., & Hadwin, A. F. (2013). New frontiers: Regulating learning in CSCL. *Educational Psychologist*, 48(1), 25–39. <https://doi.org/10.1080/00461520.2012.748006>
- Joyce, K. E., & Cartwright, N. (2020). Bridging the gap between research and practice: Predicting what will work locally. *American Educational Research Journal*, 57(3), 1045–1082. <https://doi.org/10.3102/0002831219866687>
- Kolb, D. A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Prentice-Hall.
- Korthagen, F. A. J. (2007). The gap between research and practice revisited. *Educational Research and Evaluation*, 13(3), 303–310. <https://doi.org/10.1080/13803610701640235>
- Lindblom-Ylänne, S., Nevgi, A., & Trigwell, K. (2011). Regulation of university teaching. *Instructional Science*, 39(4), 483–495.
- Malmberg, J., Järvelä, S., Järvenoja, H., & Panadero, E. (2015). Promoting socially shared regulation of learning in CSCL: Progress of socially shared regulation among high- and low-performing groups. *Computers in Human Behavior*, 52, 562–572. <https://doi.org/10.1016/j.chb.2015.03.082>
- Nesbit, P. L. (2012). The role of self-reflection, emotional management of feedback, and self-regulation processes in self-directed leadership development. *Human Resource Development Review*, 11(2), 203–226. <https://doi.org/10.1177/1534484312439196>
- Ryan, A. M., Brutus, S., Greguras, G. J., & Hakel, M. D. (2000). Receptivity to assessment-based feedback for management development. *Journal of Management Development*, 19(4), 252–276. <https://doi.org/10.1108/02621710010322580>
- Ukrop, M., Švábenský, V., & Nehyba, J. (2019, February). Reflective diary for professional development of novice teachers. In *Proceedings of the 50th ACM technical symposium on computer science education* (pp. 1088–1094).
- Winnie, P. H., & Hadwin, A. F. (1998). Studying as self-regulated learning. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Metacognition in Educational Theory and Practice*. L. Erlbaum Associates.
- Zimmerman, B. J., & Moylan, A. R. (2009). Self-regulation: Where metacognition and motivation intersect. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Handbook of Metacognition in Education* (pp. 299–315). Routledge. <https://doi.org/10.4324/9780203876428>