

# It is Time for DiSCo – a Theoretical Model for Didactic Spatial Competence

Marie Leijon  
Malmö University

Elisabet Malvebo  
Swedish Naval Warfare  
Center, Karlskrona

Åse Tieva  
Umeå University

In this position paper we present a theoretical model on how to support teachers to develop a “didactic spatial competence” (DiSCo). We define DiSCo as: Based on proven experience and science to have the ability to plan and design teaching and learning in a variety of learning spaces; to implement teaching and learning, act and react in a variety of learning spaces and to evaluate, reflect and transform both pedagogy and the learning space. In the paper we argue that a Didactic Spatial Competence (DiSCo) can be used to frame the complex relationship between learning spaces and teaching. DiSCo concerns to plan for teaching and learning in a variety of learning spaces that support the pedagogical ideas; but it also entails implementing, that is to critically reflect over and use affordances and meaning potential in various learning spaces, to have agency and competence to act and react during teaching and learning in various learning spaces and maybe first and foremost; to use the space in a meaning-making process together with students – that is to create a place for learning. Furthermore, it includes a reflective and evaluative part.

## Introduction

In this article we present a theoretical model on how to support teachers to develop a “didactic spatial competence” (DiSCo). A Didactic Spatial Competence (DiSCo) can be used to frame the complex relationship between learning spaces and teaching. In one way, in higher education (HE) the future is now when it comes to how rapidly the learning environments change. Active learning classrooms (ALC), innovative learning environments (ILE) and flexible learning spaces (FLS) are just some examples; add in hybrid and virtual spaces and end up with a wide range of learning spaces that a teacher must be competent and confident to teach in (Leijon & Lundgren, 2018). In this moment of liminality teachers can find themselves standing on a threshold between their existing knowledge on how to use a space for teaching and learning and a new, perhaps different, way (Turner, 1969). In this position article we suggest that Didactic Spatial Competence (DiSCo) can be used as a way to support this kind of educational

development. We define DiSCo as: *Based on proven experience and science to have the ability to plan and design teaching and learning in a variety of learning spaces; to implement teaching and learning, act and react in a variety of learning spaces; and to evaluate, reflect and transform both pedagogy and the learning space.* DiSCo is a model that on a micro level can support teachers to reflect on and strengthen their arguments concerning how learning spaces affect their teaching, but also on what agency teachers have in learning spaces. On a meso level the model can support a dialogue and discussion about how learning spaces differ between disciplines and professions. On a macro level the model can serve as a starting point to discuss how teaching and learning spaces are intertwined with the larger organism that higher education constitutes.

## *Teachers and learning spaces*

There are still relatively few studies on teaching and the teacher's perspective concerning HE learning spaces, however, the field is growing (King et al. 2015; Temple, 2018). Active learning classrooms (ALC) have been shown to support pedagogical methods, team teaching, teacher movement and prompt transformative learning, where the teacher also becomes a learner (Benoit, 2017; Phillipson et al, 2018; Rands et al, 2017). There is also growing evidence of how teachers develop their understanding of pedagogy and didactic design in innovative and flexible spaces (Barrett et al., 2015; Byers & Imms, 2016). The project “Room for

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Marie Leijon is Senior Lecturer & Educational Developer, Malmö University, Sweden.

Elisabet Malvebo is Educational Developer, Swedish Naval Warfare Center, Karlskrona, Sweden

Åse Tieva is Senior Lecturer & Educational Developer, Umeå University, Sweden.

Learning” at Umeå University (Lundahl, et al. 2017) shows how flexible spaces with multiple functions make it easier for teachers to develop their student-active pedagogy. Research conducted at Malmö University (Leijon, 2016) shows how student and teacher interactions are shaped by, but also shapes, the physical learning spaces. But is it then the changing pedagogical environment or the design of the room that affects teaching? The physical learning environment itself does not merit change. The relationship is difficult to investigate because teaching and learning are complex processes, and it is difficult to isolate the space as the only contributing factor (Boys, 2009; Mulcahy, Cleveland, & Aberton, 2015). So, what kind of competence does a teacher need to be able to teach in a changing world of learning spaces? Let us start with didactics.

### *Didactics*

Stemming from a European tradition, didactics is, in this article, understood as a theory of the teaching - studying - learning process (TSL), with an emphasis on the teacher as a reflective practitioner both in planning to teach, doing teaching and in (re-)evaluating the teaching and learning that took place in a formal educational context (Uljen, 1997). Uljen highlights in his etymological analysis of the word teaching to a triadic relationship between “somebody who teaches, something that is taught and somebody who is taught” and he also stresses teaching as being “an intentional activity” (1997, p15). Hopmann (2007) captures different strands through which today’s views on didactics have developed. Didactics, in a European context, is described by Hopmann as a matter of understanding: what certain subject-content is about, and how learning develops and happens, understanding what influences teaching and learning. Hopmann also includes as part of didactics, making choices about how to organize learning in the context of where it happens. In that perspective, teaching is considered temporally and contextually bound (Uljen, 1997). Also, the need for the teacher to identify their free space to act within; the space that is framed by steering documents and limitations at different levels in the organization, including those that are real as well as those that are sensed and unspoken (Elmgren & Henriksson, 2014) are aspects of didactics.

Hopmann (2007) describes didactics as “a professional tool” and, like Uljen, also notices the relationship between the teacher, the student, and the contents to be taught/learned. The didactic triangle is often narrowed down to the three didactic questions why, what, and how, which in themselves can entail more than one aspect (Uljen, 1997; Hopmann, 2007; Wahlström, 2016). Uljen poses a risk of looking at this traditional didactic triad of teacher, student, and content in a too simplified way, many times

forgetting the context, the moral craft and the intentionality that is incorporated in the didactic process. Also of importance are pedagogical activities taking place at different levels (collective, individual and interactional), and not to be forgotten, the need for student active participation (Uljen, 1997). Uljen states that didactics in the perspective of being a theory of pedagogical process “is not limited to function as a predictor of learning results” (1997, p23). Thus, teaching is not considered to guarantee learning or the reaching of intended learning outcomes but instead has an intention to contribute to doing that. In this process both the teacher and the student are considered contributors in the process (Uljen, 1997). Selander (2017b) describes the teacher as a creator of resources and spaces for learning, or even as a designer of teaching (Selander & Kress, 2017). Biggs and Tang (2011) describe the duality between teaching and learning and put forward that teaching is “a service activity: we teach so that students may learn and what they learn depends on how they go about learning”. Hattie’s (2009) meta-study on teaching and its effect on learning, where effect size was calculated, also holds proof of this strong relationship.

Thus, in this article, teaching is not seen as the end result or the goal itself for the teacher, but rather regarded as holding a strong influence on learning; teaching is considered to play a major part of the students’ learning processes in formal education, with the teacher acting as an advocate for the learners and as a mediator of collective curriculum goals (Uljen, 1997). Didactics can be studied and viewed in light of both theories and practice and in doing so the focal point of interest is the complexity in teaching and all the decision making that a teacher has to do (Wahlström, 2016). A descriptive approach to a theory of didactics, put forward by Uljen (1997) as school didactics, due to the focus on the formal education context, is a useful starting point when trying to describe, analyze, and understand the complex pedagogical reality, where the “continuous shifting between reflection and decision-making, planning and action, evaluation and action” stand in focus, which is the case in this article, where we aim to expand teachers’ didactic spatial competence. So, how can we understand space becoming a place for learning and how can we relate learning spaces to didactics? Here we will discuss learning spaces in terms of meaning potential and affordances.

### *Spatiality*

We understand space as potential areas carrying affordances for interaction and meaning making when places are shaped. Space can refer to the physical organization of an environment and place to the social aspects of the same; that is, we are located in spaces but we act in and co-create places when we fill them with meaning

and interaction (Tuan, 1977). However, theorists like Massey and Thrift (2003) reject the dichotomy between space and place and suggest a more equivalent understanding of the concepts – that is that both space and place are social and constructed in a process. The design of a physical learning space reflects how we (or the formal learning institution) think about learning. We know that space affects the way we feel and interact. Space can make us feel insecure, invited, or rejected and space could be perceived as demanding or inviting for activity. The design in a room communicates what is possible and what behaviors are allowed. How learners imagine a space to be - perceive it, define it, and articulate their understandings of it - transforms a space into a place, determines what they do there, and influences their autonomy; but there is no determination related to space, we have agency and power to act in a space and to design our place (Leijon, 2016). Our understanding connects to a relationalist perspective where:

*Learning spaces are no longer a 'container' for human activities, a product (architectural design, a built space) that can be appropriated by their teacher and student users and that can impact on learning outcomes. Spatiality is primarily to be seen not in terms of a backdrop against which action takes place, but in terms of activity or practice. (Mulcahy et al, 2015, p. 580)*

Space shapes interaction, but interaction also shapes space; thus, it is essential to consider space in relation to negotiation and transformation as even a strong setting is open to change (Leijon, 2016). We state that the physical environment constitutes an essential element of communication where participants are active and have agency (Selander & Kress, 2010) and thus, space should be an essential aspect when a teacher designs a learning situation together with their students. Learning is complex and there is no linear relationship between space and, for example, learning outcomes (Blackmore et al, 2011).

If we now know that the physical learning environment influences student-teacher and student-student interaction – and, by extension, learning – would it not be wise to relate to space as an important aspect of didactics? Not only asking the classic didactic questions what, how, and why, but also reflecting on where the teaching is taking place and ask how this can affect our opportunities to interact, communicate, and learn? We suggest that a learning space has a meaning potential that people read and use by employing a multimodal and social-semiotic understanding stemming from Halliday's (1978) metafunctional theory and developed by Kress & van Leeuwen (2001). The idea, to read the space as a three-dimensional text, stems from a social semiotic perspective that affords a broad way to explore communication meta functionally. Halliday's notion of three

communicative functions is based on the idea that in all forms of texts – and here we understand space as a text – three types of potential meaning exist simultaneously: the ideational, the textual, and the interpersonal metafunctions (Stenglin, 2009; Leijon, 2016; Casanova, di Napoli & Leijon, 2018; Ravelli, 2018). The ideational metafunction concerns the meaning of space in relation to the functions space has been designed to fulfill. What is the space about and to what use is it put? How do we name and classify different spaces? Ideational meanings are constructed by the sense of content in a space. The textual metafunction, can be understood as the organization of the space into a meaningful whole. For example, how is the space composed and arranged? How does it connect to other spaces? The interpersonal metafunction concerns the way space relates to its users and how it enables interaction.

We know this: when students and teachers enter a room, they read it in similar ways and bring this reading into the situation; thus, they have expectations of the type or subject presented and the affordances of space. During a class, both teachers and students have more or less agency and they use the affordances in a learning space during their meaning-making processes. This process could be based on explicit and conscious choices or not, however, the space is always used and thus becomes a resource that both teachers and students read, transform, and re-design in action (Leijon, 2016). Thinking about learning spaces as a three-dimensional text that carries a meaning potential for us to interpret, to use, and to interact with in different ways, could be a useful tool for teachers when they are developing their Didactic Spatial Competence. Teachers are professionals with pre-existing understandings of spaces, sometimes underdeveloped, sometimes neglected, but also sometimes used as powerful resources when designing teaching. The communicative affordances could help both teachers and students to unpack and reflect upon the functions of and the interaction within a space. The multimodal and social semiotic concept of a learning space carrying meaning potential connects to other theoretical ideas like socio-materialism (Massey, 2005; Mulcahy, 2018) where learning spaces are understood as 'staged, performed or enacted in relations between bodies and material objects, including physical spaces' (Mulcahy, 2018, p. 4). From a socio-material perspective, taking it a step further than a social semiotic perspective, people and the material practice are intertwined, and not separate entities, thus learning spaces are always being produced in a never-ending interaction created by an entanglement of resources, both human and non-human.

In the first two parts of this article we have related didactics and pedagogy to learning spaces and suggested that there is a need for teachers to acknowledge the relation

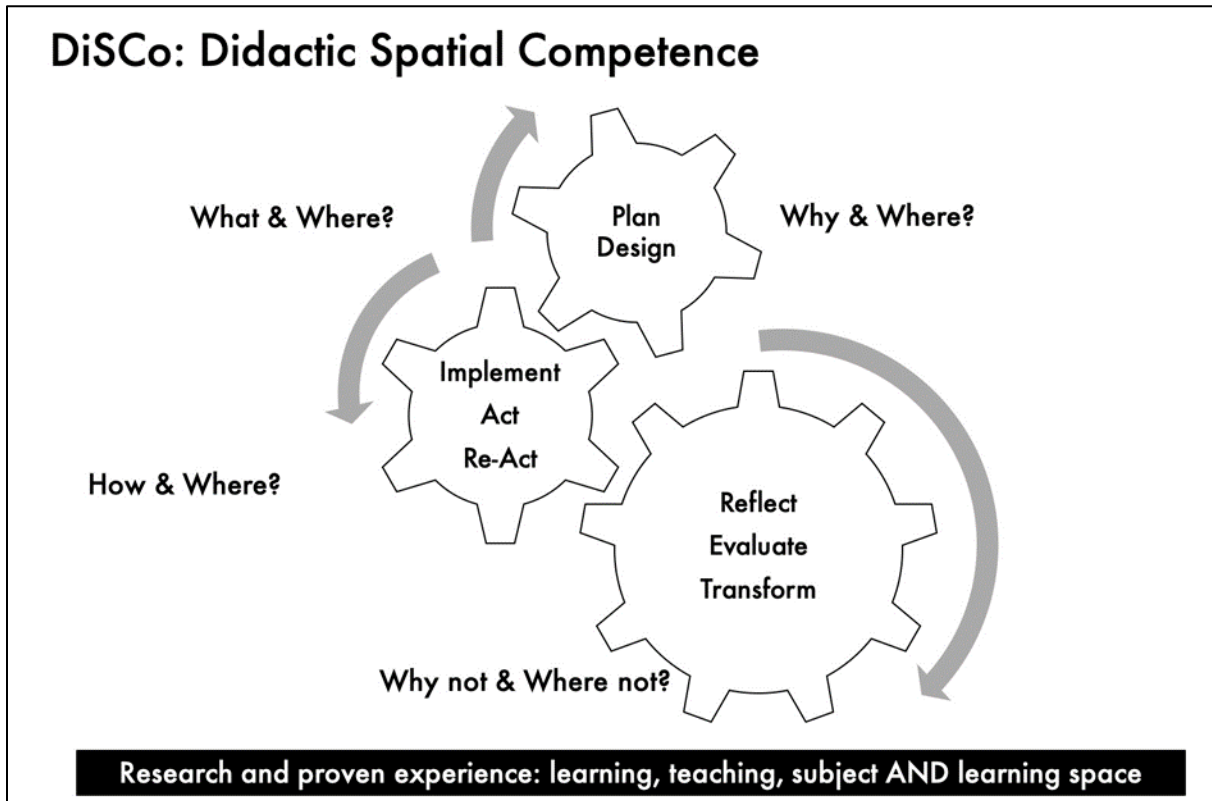


Figure 1. DiSCo: Didactic Spatial Competence

between people and space. We have also pointed to the need for teachers to reflect on how to design, conduct, and evaluate teaching in relation to learning spaces. But what kind of competence does a teacher need to do that? Our suggestion is DiSCo but let us take a look at what others suggest first

### Competence

The idea of a certain teacher's competence in relation to physical learning spaces is not new. Lackney (2008) talks about how a lack of environmental competence in, for example, ownership and knowledge of how to use a space affects both learning and teaching. Environmental competence is a concern on an organizational level according to Lackney. Of special interest for our project is the level of environmental competence where the highest level "highly proficient" is defined by 1) an explicit awareness of the impact a learning space may have on both student and teacher interaction; 2) knowledge about how a learning environment is related to behaviour and 3) skills to make changes in a learning environment (Lackney, 2008, p. 137). More recently Mahat et al (2018) elaborate on the concept "spatial competency", and a teacher with Spatial Competency can, for example, evaluate how affordances in a space affect learning and adjust the learning space, adapt

pedagogies and evaluate the spatial impact on learning. A teacher could also have a "spatial literacy" (Troelsen, (2018) based on Lefebvre's (1991) spatial triad - the perceived space, the conceived space, and the lived space. By using the concepts, Troelsen is trying to capture how teachers understand a learning space, how they describe activities and how they actually act and interact in a learning space. All these concepts - environmental competence, spatial competency, and spatial literacy - highlight important aspects of what teachers need to know as professionals acting in a learning space; but these concepts all start with space. Our ambition is to start with pedagogy and didactics.

### *Now it is time for DiSCo!*

The point of departure is that teachers are professionals with experience of and knowledge about varying learning spaces in higher education. A teacher on their way to DiSCo would organize content and learning activities while critically reflecting about the spatial setting to best support students' learning. A teacher on the way to DiSCo has developed competence and agency to act, re-act, and interact in the learning space; and can critically reflect on all aspects. Our model is a first step on the way to unpacking what kind of knowledge a teacher would need to know to develop a DiSCo. The challenge is to support teachers to foreground

their spatial competence as a part of the didactic and pedagogical competence.

DiSCo highlights how a teacher has to make didactic choices based on proven experience and science when it comes to designing learning activities in a specific learning space. This entails asking the didactic questions including why and where what and where; how and where; why not and where not. DiSCo includes planning for teaching and learning in a variety of learning spaces that support the pedagogical ideas; it also entails implementing, that is to critically reflect over and use affordances and meaning potential in various learning spaces, to have agency and competence to act and re-act during teaching and learning in various learning spaces and perhaps first and foremost, to use the space in a meaning-making process together with students – that is to create a place for learning. Furthermore, it includes a reflective and evaluative aspect so that teachers and students can decide on how to work in different learning spaces in the future. This may need transformation, but each step should be informed by research and proven experience - all in relation to learning, teaching, the subject, and the learning space.

## Conclusion

In this article we have suggested a model for how teachers can develop their Didactic Spatial Competence (DiSCo). Teachers are professionals with deep knowledge when it comes to learning, teaching, and their subject discipline. To use didactics as a starting point highlights the content and the interactions between teachers and students from a relational perspective and acknowledges that a place for learning is something that teachers and students create together. A more developed didactic spatial competence could support teachers in their everyday practice. We also suggest that DiSCo could serve as a model for reflection.

On a micro level DiSCo is a model that emphasizes teacher competence, not the lack of or the need for teachers to change. It is a part of being a professional teacher to design, reflect, and transform teaching for learning. Our ambition is to support teachers to include physical learning spaces in this important work.

On a meso level DiSCo serves as a tool for a teacher to build arguments, not based only on a personal practice, but grounded in science and proven experience.

On a macro level DiSCo highlights how teaching and learning spaces are crucial resources for teachers as professional change agents in the ongoing development of learning spaces in higher education.

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