Social Distancing During Corona – Experiences and Consequences of Increased Distant Teaching

Pedagogiskt docenturarbete

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Experiences and consequences of increased distance teaching

Docentursarbete

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Introduction

The covid-19 pandemic has affected daily life in all its facets, including teaching in higher education. Most universities around the world, including Linköping’s university (LiU), switched to distance-mode and off-campus teaching. In practice, this means pre-recorded lectures or lectures, workshops and problem-based-learning on digital platforms like “zoom” or “teams”. Students are asked to stay home, study on their own and only connect with each other via digital media.

While these restrictions are necessary, they presumably come with costs, not only for the individual’s wellbeing and social connectedness, but also for the learning experience in the university setting.

Studying alone at home in front of their screen, students miss out on social interaction opportunities with each other and with the teacher, on direct experiences, and on the classroom atmosphere. Why this is critical and might even negatively affect learning outcomes is the first question I will address here. Then I will take a closer look at the specific situation of problem-based-learning (PBL) groups. Finally, I will try to draw conclusions and recommendations for the future of PBL at LiU.

Embodiment in education

The concept of embodiment – the thought that our cognition is tightly connected and, in many aspects, shaped by our body and our bodily interaction with our surroundings – has already been discussed in philosophy for centuries (e.g. by Kant). Recently, and mostly driven by cognitive and neuroscience, it has received renewed attention. With regard to education, the following findings exemplify the important role embodiment plays in the learning context: people can remember things better when they act them out (1); reading performance in children is related to hand writing skills and negatively affected by increased use of typing devices (2); abstract concepts are processed differently in the brain, if the individual can have some kind of sensory-motor interaction related to them (3): even the neural representation of something as abstract as numbers is entangled with our physical actions as bodies (cultural differences in finger counting affect processing of numbers(4)).

The importance of embodiment in education has been discussed widely in the field of pedagogy (5). Sensory-motor interaction with our surroundings are necessary for acquiring functional concepts of the world, and even improve our understanding and memory of highly abstract ideas. Kiefer and Trumpp state in their review on embodied education: “As human cognition is the basis for communication, planning, problem solving and action, rich embodied knowledge about the functioning of our physical and social world is highly important for the development of our societies”(5). Continued digitalization of our daily world, including learning environments, is currently
being accelerated by the covid-19 pandemic. This might have serious consequences for students around the world, as embodiment of learning content is at its lowest when presented on a screen and viewed in isolation. The lack of real-world interactions, not only with a lesson’s content, but also with the lesson’s atmosphere, the other students, the overall more interactive teaching environment of a class- or lecture-room, presumably reduces embodied memory consolidation – and possibly retrieval of learned content, as retrieval is easiest in situations, which match the consolidation (6). With regard to the medical profession, even though we also see a trend toward digitalization here, most retrieval situations will be doctor-patient-interactions, i.e. social interaction situations and not screen-viewing in isolation.

**Virtual problem-based learning**

PBL is a form of self-guided learning in a small group setting. Groups of 5 to 10 students meet in regular intervals over a term or longer. They receive one or several problems, which they use to develop their own questions together. After discussions and brainstorming, the students have time for their own research. Then they meet again and present their answers, discuss them, and relate them back to the original problem. This method of self-guided learning is supposed to increase students’ motivation, engagement and memorization (7), and is often preferred by the students (8, 9). However, these aspects of motivation, engagement and preference might be highly connected to the fact, that the PBL setting allows for a close and regular social interaction with study partners. While the digital meetings still provide the same regularity, they tend to prevent all informal talk between the students. Social interactions that would normally happen when arriving or leaving from the classroom and during the break - though not completely impossible - do not occur in the same manner¹.

While students can still engage with each other during a digital meeting, they do not physically share the learning atmosphere. Communication in digital meetings is more erratic, less communicative flow can be established, it is harder to develop a lively discussion. Even though students see each other, they do not have direct eye-contact. Eye-contact modulates social behavior and neural processing of interactions in the social brain network (10). The importance of eye-contact, also in the classroom setting, has been long known (11), and the missing direct eye-contact is addressed in many articles on virtual communication and human-robot interactions (e.g. (12, 13)).

¹ In my personal experience, students turn off their microphone and video during the break instead of engaging in colloquial chit-chat.
Furthermore, if students don’t share a physical space, it is presumably harder to perceive another participant’s enthusiasm about a topic – which would normally be mediated by interpersonal synchrony on the physiological (i.e. heart rate, respiratory rate, skin-conductance) and the neural level (14, 15). Such synchrony would increase the experienced trust and connectedness within the learning group, presumably contributing to success of learning in the PBL setting (16, 17). Furthermore, students cannot see and read their counterparts full physical expressions when interacting via digital media – which might mean that they miss some important communicative acts. Humans communicate a variety of emotional contents via gestures, body posture, facial expressions, and touch (18, 19). Specifically love and sympathy are communicated easiest and best using the non-verbal channel of touch, indicating the importance of tactile interaction opportunities. With regard to the medical profession, we face an increased risk of losing a warm expression of sympathy in the doctor-patient relationship, when medical facts are learned in the cold digital world and have to be retrieved in the interpersonal communication between doctors and patients.

As the widespread adaptation to online formats due to covid19-pandemic have been implemented only very recently, little data on its impact on higher education has yet to emerge. Previous to the pandemic, it has been shown that online PBL is comparable to online teacher-lead courses (20), however, no control group of offline PBL was included for comparison. One study on PBL during the early phase of the pandemic found that students report the difficulty of perceiving their counterparts’ body-language during the virtual sessions as most problematic (21). Consequently, organic communication flow was decreased. Students further reported it to be easier to engage in distractions during PBL, e.g. looking at other things on their screen or phone.

**Conclusions**

With the need of moving education into the virtual world, universities worldwide, including LiU, tried to implement their teaching concepts in online settings. PBL is a teaching approach that works well in the real world, where it benefits from real human interaction, shared experiences within the group and social interaction opportunities, which increase embodiment during learning of novel concepts. In the virtual world, at the current stage of technology, many of these benefits disappear, when interaction is limited to the visual-auditory senses and by only perceiving the other participants on a small picture in the video feed.

However, the virtual world offers other advantages, which might improve learning outcomes: a pilot study suggests that learning in a game setting increased outcomes for medical students (22). Virtual and augmented reality might hold additional benefits, as they allow students to interact with
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concepts and ideas, which can boost understanding, e.g. interaction with a 3D model of molecules (23, 24) or anatomical structures (25). These novel strategies should be explored and potentially implemented in order to increase learning outcomes for students in the medical field. However, with regard to the PBL setting and considering effectiveness, learning outcomes and student satisfaction, my recommendation is to try to return to a real world setting as soon as possible.

With increasing digitalization of our world, we need to protect opportunities for direct sensory-bodily relations to our environment and each other.

**Future directions**

While the pandemic is still an ongoing problem, distance teaching will continue for an indefinite amount of time. Considering that the duration of the current situation is uncertain and that we all – students, teachers and administrators in higher education – are new to this, we should reflect on what can be done to improve the distance teaching experience for the students - and for the teachers. There are many opportunities along the way of developing a course program or a PBL scenario, where such a reflection can contribute not only to improved learning outcome but also to increased wellbeing during learning. Regarding PBL specifically, it should be critically evaluated if scenarios should be adjusted to the distance mode. At the same time, it is possible to use advantages of the virtual mode to improve the collaborative learning experience, for example by gamification. Introduction of virtual coffee breaks might offer a small, but far from complete replacement of the social interaction opportunities before and after PBL sessions. Students and teachers could receive training on digital tools that can increase their feeling of connectedness during the PBL sessions, like using polls in zoom and collaborative digital workspaces like miro. Furthermore, teachers need support in order to deal with the ongoing situation, suggestions for digital tools, strategies for online PBL sessions and support in handling the changing demands.

But, and this is important: we should not only rely on *tools*, we should also try to improve our *abilities* of building a group-mindset, trust and support within the PBL groups, i.e. basic human communication abilities, empathy and compassion. How can we improve interactions in the virtual world that reduces our colleagues to small frames on the screen, which we only perceive with our visual and auditory senses? A good starting point for discussions and reflections might be to ask oneself: what do I miss most in this forced distance mode teaching?
References


24. P. P. Nechypurenko et al., Development and implementation of educational resources in chemistry with elements of augmented reality. (2020).