



Student Collaboration in Student Active Learning

Astrid M. Sølvsberg and Marit Rismark*

Ph.D., Department of Education and Lifelong learning, Norwegian University of Science and Technology,
Norway

Abstract

Student active learning refers to instructional approaches that actively engage students in the learning process through collaboration and discussion. However, the role and benefits of collaboration are described in different ways in the literature. This study aims to contribute to the understanding of collaboration in student active learning by exploring how students experience collaboration. The findings are based on reflection notes from a total of 54 students attending a course at the Master's degree level. They wrote reflection notes on their individual learning outcomes and on how group collaboration supported their learning. Their experiences of collaboration in active learning were also collected through semi-structured group interviews. The data material was analyzed through a pragmatic approach inspired by both thematic analysis and constant comparative analysis. The students report that the active learning brought them into close and binding collaboration with fellow students and their teachers. Categories such as COntract, COntextualization, COnstruction, and COnnection describe in detail how the students experienced collaboration in student active learning, and how they described the role and benefits of collaboration. To communicate to educators how such knowledge may support them when planning and implementing student active learning, we also present a conceptual framework that can guide educators and students through the phases of planning, implementing, and assessing student active learning. The framework shows how student active learning may open for student engagement, student reflection, and student influence.

Keywords: co-construction of knowledge, higher education, instruction, student engagement, student learning

1. Introduction

Student active learning has received considerable attention on the political, instructional, and research levels, where it is seen as a way to improve learning outcomes in higher education. Active learning is a wide concept, most often referring to student-centered and activating instructional methods, and instructor-led activities (Prince, 2004; Mitchell, Petter & Harris, 2017). Therefore, generally it is not seen as a concept of learning but as a concept of instruction. Active learning is not just something that students do on their own but is organized and monitored in one way or another by educators. Active learning is thus seen as an instructional approach that guides learning (Hartikainen, Rintala, Pylvas & Nokelainen, 2019).

Active learning has its roots in constructivist learning theories. Within social constructivist theories on learning, learning is seen as a social co-construction of knowledge (Windschitl, 2002). Constructivism has been used as a guide for forming instructional strategies that aim to enhance deep understanding (Merriam, 2020; Windschitl, 2002). It is difficult to define aspects of effective constructivist teaching because constructivism is a theory of learning and not a theory of teaching (Merriam, 2020; Richardson, 2003). However, active learning as an instructional approach aims to enable constructivist learning by emphasizing students' self-construction of knowledge, and their responsibility for their own learning.

Here we explore how students in higher education experience collaboration in student active learning. Based on findings from a three-year study our aim is to provide insights that can support educators in their critical, theoretical, and practical understanding of active learning in higher education. Bearing this in mind, we also present a conceptual framework that can guide students and educators when planning for and implementing student active learning in higher education. A main idea in the conceptual framework is that students have active roles, and that students and educators collaborate closely in all phases of the work.

1.1 Student active learning, defined

A review study by Hartikainen et al. (2019) shows that the concept of active learning is defined and justified in various ways in research articles. Indeed, some articles do not even provide a definition. The review shows that active learning is defined in three major ways: (1) as an instructional approach; (2) not defined but viewed as an instructional approach; and (3) not defined but viewed as a learning approach. The studies that define active learning as an instructional approach apply such terms as student-centered, opposite of lectures, reflection and thinking, student action, construction of knowledge, collaboration, and activating activities. Prince (2004) also finds that authors in the field have interpreted some terms differently. However, he maintains that it is possible to provide some generally accepted definitions and to highlight distinctions in how common terms are used. He points out that student activity, engagement, and reflection are keys for learning, and that active learning is generally defined as any instructional method that engages students in the learning process. In short, active learning requires that students perform meaningful learning activities and think about what they are doing (p. 223).

While student engagement and reflection are used as key describing active learning, the terms action and interaction are also used to describe student active learning. Examining action in and interaction with the learning environment opens for the construction of new knowledge. Our understanding of student active learning applies Dewey's (1933 / 1998) expression "learn to do by knowing and know by doing" to point out the interrelation between action and knowledge. In our definition of student active learning, participation, influence, and self-directed learning are forwarded: *"Active learning involves students as the main resource and the operators in learning activities they see as meaningful. They engage in continuous*

reflections over choices and actions when they collaborate closely, sit at the helm, and have active roles in phases such as planning, implementation, and evaluation of learning activities." Bearing this in mind, core concepts in the course design of student active learning are collaboration, engagement, and reflection. Student active learning is also described by the concepts of participation, influence, and self-directed learning.

In this way, student active learning is an instructional approach that actively engages students in the learning process through collaboration and discussion, rather than having them passively receive information from their instructors (Lee, Morrone & Sierring, 2018). At the same time, students use an inquiry-based approach when solving problems and constructing knowledge (Blau & Shamir-Inbal, 2017). In this way, collaboration is a key to the social co-construction of knowledge in student active learning.

1.2 Collaboration in student active learning

The concepts collaborative learning, cooperative learning, and problem-based learning (PBL) provide insights that may contribute positively to the definitions of collaboration in student active learning. Collaborative learning can be understood as any approach where students work together in small groups towards a common goal. According to Prince (2004), collaborative learning can be viewed as encompassing all group-based instructional methods, including cooperative learning. Cooperative learning is a structured form of group work where students pursue common goals while being assessed individually (Johnson, Johnson & Smith, 1998). While there are different types of cooperative learning methods, a core element is the focus on cooperative incentives rather than competition to promote learning. In problem-based learning (PBL), relevant problems are introduced and used to provide a context and motivation for the learning that follows (Prince, 2004). PBL involves students' self-directed learning, is always active, and usually, but not necessarily, is cooperative.

When students collaborate to promote learning they are engaged in discussions, share what they have learned, and provide feedback (Lee et al., 2018; Carless et al., 2011). Boud & Molloy (2013) point out that when learners assume active roles, they acknowledge that they are constructors of their own understanding. Studies also show that students need a variety of collaborative skills when they engage in active learning. Blau & Shamir-Inbal (2017) find that a variety of social skills are needed to perform collaborative tasks. Respect and listening to others, abilities to understand, and abilities to cooperate and avoid conflict situations are required for successful participation in collaborative learning. Studies also show that student collaboration skills are closely connected to how teachers arrange the learning situation (Lee et al., 2018; Sølvsberg & Rismark, 2012; Rismark & Sølvsberg, 2019). Thus, educators need to have insights into how the learning environment may be designed to support student collaboration. A key to such insights is knowledge on how students experience collaboration in student active learning.

2. Methods

2.1 Research context

In our study we explore how students experience collaboration in an instructional design that aims to support active learning. The starting point for the work process was a joint group task, in our case: How can a workplace develop a culture for knowledge sharing and collaboration? The students then collaborated closely to produce a hub consisting of various learning resources. They followed a three-step work process: Students produce, use and share, and redesign a hub. The students collaborated in groups and built a hub that was published in an

online learning platform. The completed hub was designed so that it could be used by others to promote learning within a given topic area.

The students first discussed, clarified, and decided how a selected target group could gain new insight through using the hub. Next, the students filled the hub with content that was meant to help the chosen target group to develop new knowledge. Some of the content comprised existing resources that the students found on the internet, and they also produced their own content, such as texts, videos, podcasts, quizzes, surveys, and modules from online teaching. In this way the students had key roles in choosing, designing, and producing the content for their hub. The work process involved collaboration within groups and between groups. The students also shared their content with other groups. Based on feedback from other users, the groups discussed and reflected on the feedback and then redesigned their hub accordingly.

2.2 The research method

A total of 54 students participated in the study, spending about 15 scheduled course classes over a two-month period on planning and building their hub. At the end of the term, they all wrote their own reflection notes on their individual learning outcomes and how the group processes supported their learning. The students' experiences of collaboration in active learning were also collected through semi-structured group interviews.

The data material was analyzed through a pragmatic approach that was inspired by both thematic analysis (Braun & Clarke, 2006) and constant comparative analysis (Glaser & Strauss, 1967/1999). As the data collection included different student groups and lasted for a period of three years, the analysis was carried out at different times, for different purposes, and in different ways. We have tried both to obtain an overarching picture and to search for overlapping themes. We have reviewed the data material, stopped, asked questions, and made continuous comparisons in the search for similarities and differences. Analysis has, among other things, taken place through "initial" and "focused" coding (Charmaz & Belgrave, 2012). Through initial coding, fragments of data were studied, while focused coding was used to extract segments of the material that seemed significant and then to compare these segments to larger amounts of data. In this way, the analysis was about moving between the transcribed text, the theoretical framework, and the study's research question. This involved constant critical and sustained discussions (Rossman & Rallis, 2003) for mutual construction of meaning between the co-researchers in the development of categories that describe the students' experiences of collaboration in active learning.

3. Findings and discussion

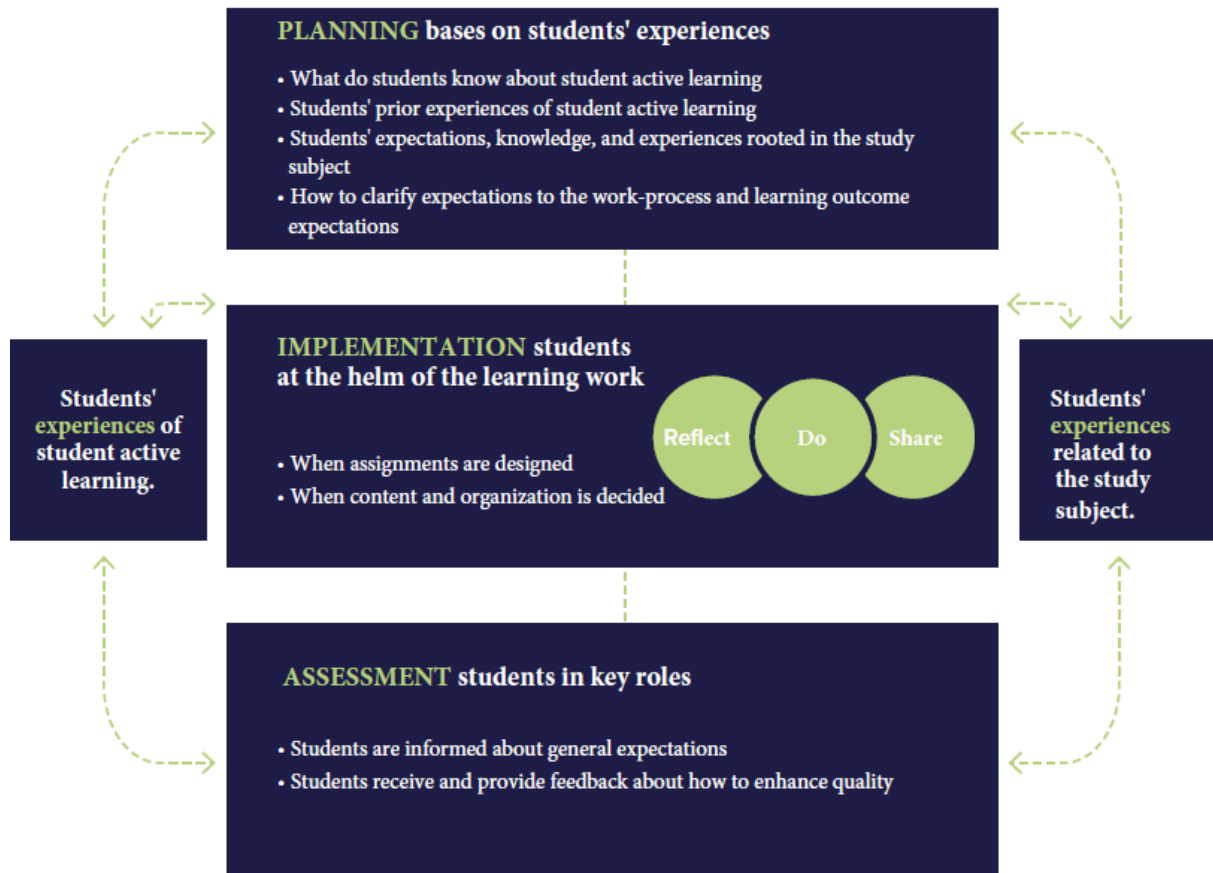
The findings that show how students experience collaboration are based on a conceptual framework that is meant to describe the instructional approach active learning. This framework functioned as a joint tool when students built their hub supported by educators and fellow students. The main finding, *committed collaboration*, refers to how the students experienced collaboration in different phases of the instructional method active learning.

3.1 A conceptual framework for planning, implementing, and assessing student active learning

During the planning phase of the study, we developed a conceptual framework that can guide educators and students in the phases of planning, implementing, and assessing student active learning. The framework indicates how active learning is meant to open for student engagement, influence, and reflection. In this process, collaboration is a key factor during the

planning and implementation phases when students share, do, and reflect, as described in the Figure 1.

Figure 1: A conceptual framework for student active learning



The conceptual framework follows a timeline for teaching: Planning, implementation, and assessment. Along this timeline, the students' experiences are always the essential starting point when learning activities are planned and carried out. This means that one point of departure for teaching is the students' prior experiences of student active learning. This also refers to the students' experiences rooted in the study subject. In this way students have active roles in all the phases, and student activity in the form of genuine participation is a condition for them to be at the helm of the learning work.

3.2. Committed collaboration

The analysis of the data material shows that the activating instructional method brought students into close and binding collaboration with fellow students and their teachers. When searching in the data material for incidents that described students' experiences of collaboration seven categories were constructed: CO1 – COntact; CO2 – CO-workers; CO3 – COllective; CO4 – COnversation; CO5 – COntextualization; CO6 – COnstruction; CO7 – COnnexion.

In the start-up phase of building the hub the group members formulated a COntact for their group. This referred to collaboration on exploring and determining what a safe learning environment is. The contract was also about the importance of commitment in the group, which could, for example, refer to completing tasks within the groups' set time limits. Such

clarifications and agreements were steppingstones that enabled the group members to function as CO-workers throughout the work process. Being co-workers reflects the students' ideas about how the students and educators worked closely together in all the phases. Furthermore, the students perceived themselves as a Collective. The groups saw themselves as a professional and social collective in that the group members provided and received professional and social support within the group. Moreover, support was provided between groups. Early in the work phase the students pointed out that CONversation was a shared tool for promoting learning. This meant that they experienced a dialog-based approach in all the learning activities. Conversation was also for-fronted when they described CONtextualization as a key for solving their joint task. Contextualization refers to how the students now saw themselves as able to explicitly describe both the practical and the theoretical bases for their joint task. They mentioned their continuous learning by using the term CONstruction. This concept refers to the fact that they perceived their hub as an end product that their target group could use to reach their learning goals. At the same time, the students mentioned their own learning outcomes by using the term CONnection. This refers to their deeper learning outcome that bridges course content, their hub as an end product, and the group members' fields of interest.

Our findings show how close collaboration is a key learning factor throughout all the phases of the student work. Furthermore, collaboration also involves a continuous commitment amongst the partners in the learning situation. In this way "*committed collaboration*" describes the core of the group dynamics that support active learning.

The findings also point out the importance of continuously establishing shared frames of reference during the joint group-work process. Additionally, using on-going joint reflections on the work process and the group dynamics may build competence in what collaboration is as a means for learning. Committed collaboration involves joint student reflections that make it possible to develop a deeper understanding of the task at hand in the way the category contextualization describes. Interestingly, the students describe their learning outcomes at a deeper level as bridging course content, their hub as an end product, and the group members' fields of interest. With all this in mind, they experience that diversity within the group becomes a resource.

4. Conclusion

This study aims to contribute to the understanding of collaboration in student active learning by exploring how students experience collaboration. Our findings suggest that the students experience collaboration as a resource for learning. In the empirical material, the analytical category *committed collaboration* describes student collaboration as a key learning factor throughout all phases of the work process. Studies show that when students collaborate to promote learning, they are engaged in discussions, share what they have learned, and provide feedback (Lee et al., 2018; Carless et al., 2011). Studies also show that a variety of social skills such as respect and listening to others are needed to perform collaborative tasks (Blau & Shamir-Inbal, 2017). The analytical category, committed collaboration, adds to these findings through detailed descriptions of the students' experiences of the close and binding collaboration during student active learning.

Committed collaboration implies that students have the social and professional capacity to be at the helm of their own learning. The social and professional capacity is about the ability to frame a contract for collaboration. This initial commitment function as a resource to establish a frame for being co-workers throughout the work process. It was also a foundation in the group collective and a basis for informed conversations. Previous studies (Boud & Molloy, 2013) show that when learners assume such active roles, they acknowledge that they are constructors

of their own understanding. Our findings introduce the concept “co-construction” to describe the group dynamics in knowledge construction. If groups are to facilitate individual and group learning in all phases of a work process, our findings suggest that committed collaboration, as described in the findings, is a main learning resource in active learning. Furthermore, committed collaboration is a joint social construct that needs to be negotiated within each student group.

To continue the conceptual development of the role of collaboration in active learning more systematic empirical and theoretical research is needed. For example, insights into how educators can organize, monitor, and develop student active learning are also called for.

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