# Pharmacy Students' Expectations and Perceptions of Student-Active Learning

**Marcel Köhler[1], Beata Godejord[2]**

Faculty of Nursing and Health Sciences, Nord University, Norway[1]
Business School, Nord University, Norway[2]

**Abstract**

*The professional role of pharmacists is continuously changing due to the needs of the labor market. The new guidelines for health and social science education programs (RETHOS) in Norway address these changes [1] and have necessitated a change in the pharmacists' study programs. Recently issued regulations [2], [3] specify the requirements for both pharmaceutical and general competencies to better prepare graduates for their future professional roles. In this context, student-active forms of learning can be particularly valuable [4]. As part of a project in the pharmacy program at the Nord University in Norway, various student-active learning methods are being developed, tested, and evaluated in terms of their usability. The aim of this study was to investigate whether students' expectations of learning activities and notions about student-active learning are in line with the purpose of the project and its goals. A questionnaire was delivered to first- and second-year pharmacy students (N = 52) at Nord University. Participation in the study was voluntary and the data was collected anonymously. The interpretation of qualitative data obtained from students' answers to the open-ended questions was inspired by content analysis. Quantitative data obtained from the answers to close-ended questions were summarized descriptively. The analysis of data reveals that the students view active learning as a participatory approach with both social and individual components. Their learning is motivated by various factors and their motivation to learn is both intrinsically and extrinsically influenced. The findings of the study guide the development of instructional approaches towards addressing both the project goals and the students' voice in a synergistic alignment.*

**Keywords:** *Student-active learning, pharmacy education*

## 1. Introduction

The continuous qualification of pharmacists, oriented towards the current state of science and tailored to labor market requirements, represents a significant task for Norwegian universities. In response to evolving job requirements within the healthcare sector in general [2], as well as the increasing demand for knowledge and competencies specific to pharmaceutical personnel [3], Norwegian educational policies have undergone legislative amendments in recent years. The guidelines for education in health and social care education (RETHOS) have also been revised [1] in accordance with these laws [2], [3]. The enacted regulations [2], [3] describe the requirements for pharmaceutical and generic competencies, aiming to better prepare graduates for their future professional tasks.

Given the new legal framework and the ongoing advancement in pharmaceutical science, a revision of existing pharmaceutical programs in Norway is inevitable. These revisions entail not only structural and content related improvements to the degree programs, but also adjustments to the didactic approach in individual courses, aiming to meet the demands for enhanced problem-solving skills, teamwork, and reflexivity among pharmaceutical personnel [2].

Consequently, the pharmaceutical study program at Nord University in Namsos has been both in structure and content optimized as a result of RETHOS. With the objective of better aligning students' learning process with the requirements set and facilitating lifelong learning [4], the focus of the didactic approach in courses has been shifted from traditional teaching towards student-active forms of learning.

## 2. Background

### 2.1. Active Learning as Key Element Of An Educational Development Project In Pharmacy Studies At Nord University

In the pharmacy program (B.A.) at Nord University the project *Staying Connected Through Connecting: Peer Learning and Peer Assessment in Pharmacy Education* is being conducted (project duration: 2022-2024). The project is funded by the Norwegian Directorate for Higher Education and Skills (HK-DIR) and Nord University. The aim is to develop a study program with a consistent focus on co-learning (learning from and with each other) and peer assessment as active forms of students' learning. Various student-active teaching/learning activities are being developed, tested, evaluated, and implemented to achieve this aim.

Several studies have shown that pharmacy students have positive experiences with student-active learning [5], [6]. The premise of active learning is that students need to be involved in doing and thinking about what they are doing. While carrying out activities, they must be engaged in higher-order thinking such as analysis, synthesis, and evaluation [7]. Furthermore, in active learning practices, exploration of students' attitudes and values should be emphasized [7], [8]. The effectiveness of active learning has been evidenced across various disciplines for over three decades. It is now well documented that, compared to a traditional approach of instruction, active learning engages students in learning process on a deeper level and as a result ensures better understanding and retention of the learning material [7], [9], [10], [11], [12]. In addition, interactive aspects of student-active learning contribute to the development of critical thinking [13], which is a key generic competency.

However, in order for the project to succeed, it is a prerequisite that the students are motivated both for the subject and for actively participating in the learning activities. A positive effect of active learning on learning motivation and learning performance has been verified [5], [14]. Research guided by self-determination theory (SDT) shows that people's sense of volition and initiative is co-catalyzed by social context. Motivation emerges and people can be proactive and engaged when three innate psychological needs - autonomy, competence and social relatedness - are satisfied [15]. The state of being motivated is reached when a self-regulated and proficient action (autonomy and competence) is accompanied by the feeling of belonging to a social group and being a part of a group culture (relatedness). By reducing the influence of academic staff when using student-active forms of teaching/learning, students are given an opportunity for participatory learning across groups and cohorts, to expand their decision-making ability and provide greater opportunity for reflection [16], [17]. To support the acquisition of professional and social competencies in academic teaching/learning processes in pharmaceutical study programs, it can be assumed that the application of student-active forms of learning could be useful.

Furthermore, this approach appears to be valuable for the target-oriented planning, design and evaluation of student-active teaching/learning in pharmacy studies. For the further didactic development of the pharmacy study program at Nord University, however, the students' assessment of this approach is also of considerable relevance, as the application of student-active forms of learning requires an active participation of students in teaching/learning processes. Against this background, the present study explores the question:

> Q: What expectations and perceptions of student-active learning do pharmacy students at Nord University have?

### 2.2. Project Related Activities

As part of the project, program-specific and course-specific activities for student-active learning are continuously developed, planned and implemented for students from all study years of the Bachelor Pharmacy study program, taking into consideration curricular framework conditions and student requirements. Furthermore, teaching staff is prepared for pedagogical-practical work with student-active forms of teaching/learning in workshops, joint discussions, and individual coaching sessions. Student representatives can regularly participate in the workshops.

The project activities include among other topics on pedagogical-didactic approaches such as peer-learning, peer assessment, problem-based learning and team-based learning. Furthermore, activities on didactic-methodical organization of student-active teaching/learning processes (e.g. group work), teaching methods (e.g. case studies, jig saw method [18]), feedback techniques (e.g. think-pair-share) [19], reflection, supervision, or metacognition are worked on and prepared for the regular courses. Students are familiarized with the student-active learning approach at the beginning of their studies and prepared for the individual learning activities they will encounter in the course of their studies.

### 3. Data Collection and Analysis

The data collection was conducted with first (n = 28) and second (n = 24) year students of the pharmacy study program at the Faculty of Nursing and Health Sciences at Nord University. The students' perceptions and expectations were collected using a self-administered questionnaire containing two questions with a closed five-point Likert scale. In these questions, the respondents had the opportunity to name up to three teaching-learning activities themselves and to assess their expectations of the extent to which these activities help them to learn. In addition, the questionnaire contained a nominally scaled question on the familiarity with the term "student-active learning" as well as a question in which the respondents were asked to freely state their thoughts on the term "student-active learning".

The data analysis carried out has an exploratory character to generate a basis for hypothesis-testing research approaches. Data from the closed questions was summarized based on descriptive analysis. All answers to the free text question were collected and analyzed in a single text document. Students responded with individual words/phrases that they associated with students' active learning. The technique of examination and interpretation applied to the qualitative data was content analysis. Content analysis is typically performed on various forms of human communications including linguistic and non-linguistic texts [20]. As other artefacts of social communication, written documents are amenable to content analysis [21]. To shape analytical framework, qualitative data was coded, and subsequently the interpreted meaning was attributed to it. Data analysis was conducted inductively. The process of coding occurred without a pre-existing model. Assumptions were data-driven, i.e., codes were constructed by naming the data. It was crucial to understand participants' views from their perspective and therefore follow grounded theory mandate [22]. The coding process was assisted by qualitative data analysis software (CAQDAS) NVivo14.

Data collection was conducted in Namsos in weeks 33 and 34 in 2022 before the students participated in learning activities related to the project. Recruitment was done by verbally informing all students who were present in compulsory classes about the purpose of the study and participation. The students were then invited to participate in the study. Participation in the study was anonymous and voluntary, and no personal data was collected. The study was therefore not reportable to the Norwegian Center for Research Data (NSD). The students did not have the option of withdrawing from the study afterwards.

### 4. Results

The term student-active learning was familiar to 34 % of students, while 40 % did not know what it was and 26 % answered "don't know".

Qualitative data obtained from the answers to the open-ended question was coded in two rounds. The round of open coding was followed by a round that specified eight codes: four in vivo codes, three descriptive codes and one value code (Fig.1). In participants' explicit statements, "student-active learning" was associated with activity, participation, learning and engagement (in vivo codes). On the level of beliefs and attitudes "student-active learning" was associated with being focused, exploratory, goal-oriented, creative, untraditional and student-centered (the content of a value code).

**Fig.1.** Types of codes assigned to students' associations with the concept 'student-active learning'. Overview generated by CAQDAS Nvivo14.

Descriptive codes encapsulated students' associations in three clusters: a cluster named "Forms of work - grouping tools, techniques and methods of learning"; a cluster named "Individual responsibility - emphasizing the importance of individual contribution"; and a cluster named "Social – giving prominence to collaborative aspects of learning". Associations with social components of learning were most numerous in comparison to other associations (Fig. 2). Within this code, the categories most frequently named were cooperation, discussions and helping each other.
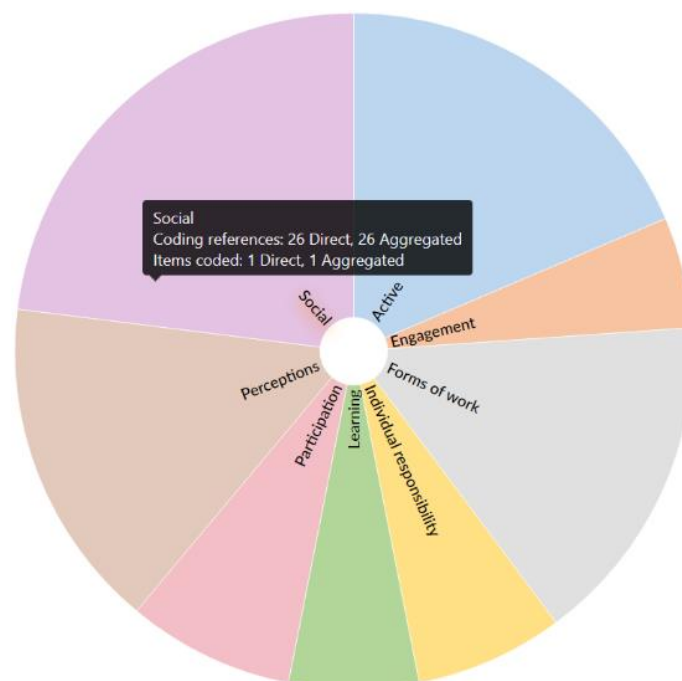


**Fig. 2.** Proportions between the coded associations. Hierarchy chart generated by CAQDAS Nvivo14.

Social support was also indicated as a determining factor helping to learn in pharmacy studies. In the closed-ended question about activities that assist students in their learning, "Feedback from teachers and fellow students" received the highest number of the top value responses, i.e. 'To a very large extent'. The highest numbers of neutral and below the neutral values were attributed to answer alternatives "Watching films/recodings from a lecture" and "Individual work".
In the answers to the question about factors motivating students to learn the highest number of top value responses and only the top value responses were attributed to the answer alternative "The

subject interests me" while the highest numbers of neutral and below the neutral values were assigned to the answer alternative "The subject is challenging for me".

**5. Discussion and Conclusion**

In the field of pharmacy, there is evidence that active learning increases student outcomes and reduces the probability of failure [5]. For first year students, it can be difficult to know what to expect and what the different learning activities include. The learning outcomes of the activities are also influenced by whether students are prepared and whether they work alone or with others. However, our data gives an indication of which learning activities students prefer, and thus provide a starting point for dialog with students about factors facilitating learning, the value of different activities for deeper learning, and appropriate forms of learning and assessment in the study program.

This study shows that students associate active learning with learning strategies and learning activities that focus on 'doing', while 'thinking about doing', i.e. the element of reflection is not explicitly mentioned in the answers to the open-ended question. It is possible that this is tacit among students and is related to the fact that e.g. reflections/thoughts were not mentioned in the answer alternatives to the closed-ended questions. It may also be that students are not accustomed to associate the term "active" with cognitive components such as reflection, evaluation, or analysis, the processes *de facto* crucial to knowledge construction. Nevertheless, the results demonstrate the importance of encouraging students to reflect before, during and after learning activities. Reflection, especially reflection on one's own learning and its adaptation (meta-learning), is one of the focus areas emphasized in the project. It is important that students are encouraged to reflect on their own knowledge and learning at the beginning and throughout their studies so that these competencies can be practiced and developed systematically over time.

The results of the study are based on a limited sample of pharmacy students from two years of study and cannot be generalized. The questionnaire developed has not been validated or tested for reliability. However, the answers to the questionnaire provide information about the perception and expectation of student active learning in pharmacy studies and help defining focus areas for awareness raising work with reference to crucial aspects of learning process.

**REFERENCES**

[1] Ministry of Education and Research "Nasjonale retningslinjer for helse- og sosialfagutdanningene (RETHOS)", 2017, retrieved from https://www.regjeringen.no/no/tema/utdanning/hoyere-utdanning/utvikling-av-nasjonale-retningslinjer-for-helse--og-sosialfagutdanningene/id2569499/, Updated: 24.08.22.

[2] Lovdata "Forskrift om felles rammeplan for helse- og sosialfagutdanningene", 2017 retrieved from: https://lovdata.no/dokument/SF/forskrift/2017-09-06-1353 (accessed: 27.03.2024).

[3] Lovdata "Forskrift om nasjonal retningslinje for farmasøytutdanningene, bachelor- og masterutdanning i farmasi", 2020, retrieved from: https://lovdata.no/dokument/LTI/forskrift/2020-01-03-25, (accessed: 27.03.2024).

[4] Freeman S., Eddy S.L., McDonough M., Smith M.K., Okoroafor N., Jordt H. et al. "Active learning increases student performance in science, engineering, and mathematics", Psychol Cog Sci 111, 23, 2014, pp. 8410-15, www.pnas.org/cgi/doi/10.1073/pnas.1319030111.

[5] Koo C.L., Demps E.L., Farris C., Bowman J.D., Panahi L., Boyle P. "Impact of Flipped Classroom Design on Student Performance and Perceptions in a Pharmacotherapy Course", Am J Pharm Educ 80 (2), 2016, p. 33.

[6] Miller D.M., Khalil K., Iskaros O., Van Amburgh J.A. "Professional and pre-professional pharmacy students' perceptions of team based learning (TBL) at a private research-intensive university", Curr Pharm Teach Learn 9 (4), 2017, pp. 666-70.

[7] Bonwell C.C., Eison J.A. "Active Learning: Creating Excitement in the Classroom", ASHE-ERIC Higher Education Reports, 1991, retrieved from: ERIC - ED336049 - Active Learning: Creating Excitement in the Classroom. 1991 ASHE-ERIC Higher Education Reports., 1991 (accessed 27.03.2024).

[8]  Carr R., Palmer S., Hagel P. "Active learning: the importance of developing a comprehensive measure", Active Learn. High. Educ. 16, 2015, pp. 173–186, https://doi.org/10.1177/1469787415589529.

[9]  Ambrose S.A., Bridges M.W., DiPietro M., Lovett M.C., Norman M.K., Mayer R.E. "How learning works: seven research-based principles for smart teaching", San Francisco: Jossey-Bass, 2010.

[10] Hake R. "Interactive-engagement versus traditional methods: A six-thousand-student sur-vey of mechanics test data for introductory physics courses", American Journal of Physics 66, 1998, pp. 64-74.

[11] Prince M. "Does active learning work?", A review of the research. Journal of Engineering Education 93, 2004, pp. 223-231.

[12] Springer L., Stanne M.E., Donovan S.S. "Effects of small-group learning on undergraduates in science, mathematics, engineering, and technology", Rev. Educ. Res. 69, 1999, pp. 21–51.

[13] Strømsø H.I., Lycke K.H., Lauvås P. (eds.). "Når læring er det viktigste: undervisning i høyere utdanning", Oslo: Cappelen Akademisk Forlag, 2016.

[14] Schiefele U., Schaffner E. "Motivation", In: Wild, E., Möller, J. (eds.). Pädagogische Psychologie, 3rd edn., Berlin, Springer, 2020, pp. 163-186.

[15] Deci E., Ryan R. (eds.). "Handbook of self-determination research", University of Rochester Press, New York, 2002.

[16] Rohr D., Ouden H., Rottlaender E.M. "Hochschuldidaktik im Fokus von Peer Learning und Beratung", Basel, Beltz Juventa, 2016.

[17] Biggs J., Tang C. "Teaching for Quality Learning at University", 4th edn., New York, Open University Press, 2011, pp. 34-57.

[18] Aronson E., Patnoe S. "Cooperation in the Classroom: The Jigsaw Method", 3rd edn., London, Pinter & Martin Ltd, 2011.

[19] Godejord B., Horst Zeiss D., Amundstuen L. "Collaborative Discussion as a Strategy Encouraging Active Learning in Pharmacy Education", 2023, retrieved from: https://conference.pixel-online.net/files/foe/ed0013/FP/7912-SENG6024-FP-FOE13.pdf (accessed 27.03.2024).

[20] Berg B.L. "Qualitative Research Methods for the Social Sciences", Boston, Pearson Education, 2009.

[21] Saldana J. "The Coding Manual for Qualitative Researches", London/UK, Sage Publications, 2014.

[22] Charmaz K. "Constructing Grounded Theory: A Practical Guide Through Qualitative Analysis", London/UK, Sage Publications, 2012.