

## Student-Centered Learning: Teachers' Readiness and Challenges

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**Abstract:** Learning model in Kazakhstani Universities is being focused on transforming education from teacher-centered to student-centered approach. This transformation requires academic staff retraining and a significant modernization of educational process. In this article we discuss issues of methodological readiness of academic staff for student-centered learning, which has been recently implemented into the practice at the Chemistry Faculty of the Karaganda Buketov University. We have studied ways in which educators can be trained in innovative teaching methods. One of the ways is the advanced training course organized at the Karaganda Buketov University within the framework of the ENTER Erasmus+ project. We discuss the progress made by academic staff in mastering interactive lecturing, case-study, project-based learning as well as consider the problems and difficulties that teachers of the Chemistry Faculty face when organizing learning& teaching process according to the student-centered approach principles. Academic staff of four Departments of Karaganda Buketov University, namely Inorganic and Technical Chemistry, Physical and Analytical Chemistry, Organic Chemistry and Polymers, Chemical Technology and Petrochemistry Departments were involved in this study. Surveys were carried out to gain detailed information about issues considered. The findings were subsequently analyzed to provide insight on the readiness of university teachers for student-centered learning under modern conditions.

**Keywords:** Student-Centered Learning, Innovative Teaching Methods, ENTER Erasmus+ Project

## Introduction

Student-centered learning (SCL) has received considerable attention in the world teaching practice (Aslan, S. et al., 2013). Now there is empirical evidence that the active involvement in the learning process is important. J. Barraket in a reflective case study concluded that the re-orientation of the curriculum toward student-centeredness had a positive effect on student performance, learning experience and subject evaluation. However, the analysis also found that students continued to place value on more formal teaching methods (Barraket, J., 2005). Our earlier studies also showed that application of the student-centered approach resulted in improvement in students' achievement on exams. A majority of students viewed the active learning methods positively (Sugralina L. et al., 2017).

Despite widespread use of SCL, many institutions or educators claim to be putting SCL into practice, but in reality, they are not (Lea et al., 2003). M.T. Borhan et.al. investigated readiness in implementing SCL in the Malaysian secondary school. Borhan et.al. reported that teachers were aware of SCL as an approach to motivating students to participate actively in learning and encouraging a meaningful learning process. However, the findings also indicate that the implementation of SCL in the selected secondary school is still in its infancy and that teacher-centered learning is the dominant learning style. A gradual stage-by-stage implementation of SCL in secondary school can be an alternative measure to ensure successful implementation of SCL (Borhan et al., 2020). Findings of the Erasmus+ project "Empowering teachers for a student-centered approach" performed by Irena Marinko et al. revealed that teachers and students in several European countries were acquainted with SCL to a certain degree, but they were in need of more guidance, knowledge and understanding regarding its application and practice. Shift to the SCL paradigm dictates the need for constant modernization of the educational process and involves the introduction of new teaching technologies into the teacher's methodological approach, application of innovative and original teaching methods. Some of the SCL activities include peer feedback, peer argumentation, gamification, and formative assessment, (see Latifi & Noroozi, 2021; Latifi et al., 2020, 2021; Noroozi 2018, 2022; Noroozi et al., 2016; 2020; Taghizadeh Kerman et al., 2022; Valero Haro et al., 2019; 2022). Therefore, it is important to understand the readiness of the university's teachers in Kazakhstan to implement SCL.

This paper aims to unravel the readiness of the teachers of the Chemistry Faculty of the Karaganda Buketov University to implement and adopt SCL. The findings were subsequently used to provide insight on the development of SCL in the faculty practice.

## Method

This is case study research, which was carried out to understand faculty's readiness to implement SCL, particularly from the teachers' perspective. The setting of the study is the Chemistry Faculty of the Karaganda Buketov University.

In order to determine the initial level of motivation and teachers' methodical readiness to apply innovative teaching methods in the educational process, we conducted a survey of the Chemistry Faculty teaching staff in 2021-2022 academic year. We developed our own questionnaire in two training languages, which included 16 closed and open-ended questions. A total of 43 teachers that was 82% of academic staff took part in the survey. Questionnaires of the teaching staff were subjected to subsequent analysis of the data obtained.

## Results

### Information about Respondents

Most of the respondents, namely 79% have an academic degree and they are teachers with teaching experience from 15 to 19 years. Representatives of all four departments of the Chemistry Faculty took part in the survey. Teachers of the Department of Organic Chemistry and Polymers were the most active ones (19 persons or 44 %). At the same time, teachers in the position of associate professor showed the greatest activity.

### Knowledge and Awareness on SCL

First, we wanted to find out how well teachers of the Chemistry Faculty are familiar with innovative teaching methods and how often they apply these methods in their teaching practice. According to the survey results, most of the teachers surveyed are familiar with the SCL approaches. The innovative teaching methods most mastered by teachers are presented in Table 1. They are interactive lecture, problem lecture, and work in small groups, brainstorming, project-based learning in practical and laboratory classes. Innovative teaching methods that received the least number of teachers' votes are creation of concept maps and project-based learning at lectures.

Table 1. The Innovative Teaching Methods Most Mastered by Teachers

Method	Number of respondents, persons	Percentage, %
Interactive lecture	33	76
Problem lecture	24	55
Work in small groups	24	55
Brainstorming	24	55
Project-based learning in practical and laboratory classes	28	65

A total of 27 people (63%) answered that they periodically use innovative teaching methods in the educational process, 13 people (30%) constantly use them, and 3 people (7%) completely ignore them. The assessment of methodological readiness of teachers for the practical implementation of SCL showed that 10 respondents (23%) confidently use the SCL methods in teaching, and none of the teaching staff of the Chemistry Faculty declared a complete lack of practical skills in applying innovative approaches in teaching.

To master innovative teaching technologies academic staff uses different sources of information. Internet resources & educational and methodical literature are the most popular ones. Among the main incentives for the use of innovative teaching methods in the educational process, teachers named the need for continuous improvement of students training.

### Optimism towards SCL

In the process of teaching chemical disciplines, academic staff of the Chemistry Faculty prefers to use interactive lecture - 29 persons (67.4%), work in small groups - 20 persons (46.5%) and problem lecture - 16 persons (37.2%).

Table 2. Teaching Methods that are mostly used by Teachers

Method	Number of respondents, persons	Percentage, %
Interactive lecture	29	67.4
Problem lecture	16	37.2
Work in small groups	20	46.5
Case – study	10	23.2
Blitz – poll	17	39.5
Brainstorm	17	39.5
Creation of concept maps	5	11.6
Problem-based learning	14	32.5
Project-based learning at lectures	9	20.9
Project training in practical and laboratory classes	24	55.8
Innovative methods in online mode	15	34.8
Innovative methods in offline mode	20	46.5

Three teachers of the faculty, namely 7% answered that they do not use active learning methods in their teaching activities. At the same time, teachers stated the need for in-depth study of some teaching methods. The data are presented in Table 3.

Table 3. Teaching methods which demand more in-depth practice by academic staff

Method	Number of respondents, persons	Percentage, %
1	2	3
Interactive lecture	3	6.9
Problem lecture	9	20.9
Work in small groups	2	4.6
Case – study	16	37.2
Blitz – poll	7	16.2

Method	Number of respondents, persons	Percentage, %
1	2	3
Brainstorm	11	25.6
Creation of concept maps	22	51.1
Problem-based learning	10	23.2
Project-based learning at lectures	12	27.9
Project training in practical and laboratory classes	9	20.9
Innovative methods in online mode	19	44.1
Innovative methods in offline mode	15	34.8

Two teachers (4.6%) noted that they are not interested in these methods at all.

### Challenges in implementing SCL

Assessing the innovative teaching methods' effectiveness for the material assimilation by students, only 5 people (12%) of the teachers surveyed consider it to be very high, while only 1 person (2%) of the interviewed teachers noted very low efficiency. The majority of respondents, namely 11 people (26%) believe that the effectiveness of students learning the material when using innovative teaching methods is average (5 points on a 10-point scale).

Teachers were also asked to describe problems that arise when implementing a SCL to teaching. Teachers' answers are given in Table 4.

Table 4. A number of problems when implementing SCL

Problem	Number of respondents, persons	Percentage, %
Students' unwillingness to take responsibility for managing projects; activities in the classroom and outside the classroom	22	51.1
Uneven assimilation of knowledge by students	17	39.5
Difficulty in assessing students' academic achievements	7	16.2
Preparing for classes requires more teachers' time	23	53.4
Noise in the classroom and chaotic organization of the learning space	1	2
Insufficient number of media facilities in the classrooms	1	2

To overcome these problems teachers suggested the following ideas:

- Informing students about the ideas behind student-centered learning – 11 persons (25.5%);
- Phased implementation of student-centered learning – 22 persons (51.1%);
- Application of various forms of stimulating students to independent learning activities – 22 persons (51.1%);
- Giving students enough time to learn at their own pace and empowering learners as mentors to peers – 11 persons (25.5%);
- Methodological assistance to teachers for the implementation of educational innovations from the faculty and the University – 14 persons (32.4%);
- Comprehensive support for the best experience in teaching for implementation of student-centered learning approaches – 21 persons (48.8%);
- Equipping classrooms with media equipment – 1 person (2%);
- Reducing the teaching load – 1 person (2%).

## Discussion

Analyzing results of the teaching staff survey, it can be noted that the majority of teachers, namely 93% positively perceive the need to implement SCL approaches to the educational process. This finding is in accordance with the literature data, showing that students, teachers and educational institutions are aware of SCL benefits (Attard A. et al., 2010). Nevertheless only 30% of teachers surveyed apply innovative teaching methods regularly and 63% of teachers periodically use innovative teaching methods in the educational process. However, Bologna process implies applying SCL or its elements in most of the time and classes. Teachers usually use interactive and problem lecture, work in small groups, brainstorming and project-based learning in practical and laboratory classes. Academic staff of the Chemistry Faculty applies innovative teaching methods in the educational process along with traditional teaching methods.

At the same time, 23% of teachers evaluated their methodological readiness for the maximum score on a 5-point system, while 40% of teachers, i.e. the majority rated their readiness at 4 points. We believe that teachers who accept SCL have to work much harder to develop the knowledge and personal characteristics necessary for SCL approach. Teachers should have a considerable level of the didactic knowledge, prepare teaching and learning materials and provide e-learning possibilities. They also need to have more time for preparation for classes and possess different technical and methodological resources to implement SCL into practice. All this knowledge and qualities need further support by professional development programmes. A total of 37 % of teachers interviewed would like to take an advanced training in innovative teaching methods. Especially young teachers need more guidance, knowledge and understanding regarding SCL application and practice. Recently, distance learning has become relevant, so the fact that 44.1 % of teachers are interested in innovative teaching methods in online format is not surprising.

Young university teachers have some troubles with SCL. At the beginning of their career, academics have very little experience. Very often, young university teachers receive no training as regards the pedagogical approaches, teaching strategies, practical instructions, and the availability of learning technologies. In order to provide methodological assistance to young teachers at the Karaganda Buketov University advanced training courses were launched as a part of the international project 598506-EPP-1-2018-1-PT-EPPKA2-CBHE-JP ENTER “Pedagogical training of engineering teachers” in December 2020. More than 50 teachers of our university successfully completed these advanced training courses. In addition, the faculty of additional education functions on a permanent basis at the university, which regularly conducts teacher training courses, including those aimed at improving pedagogical skills.

Assessing the innovative teaching methods’ effectiveness for the material assimilation by students, only 12% of the teachers surveyed consider it to be very high, while only 2% of the interviewed teachers noted very low efficiency. The majority of respondents, namely 26% believe that the effectiveness of students learning the material when using innovative teaching methods is average (5 points on a 10-point scale). SCL is not without problems and it is periodically criticized (Guest R., 2005).

Teachers also noted that they faced a number of problems when implementing a SCL to teaching. Among the most important problems teachers pointed out that preparing for classes requires more teachers’ time, students don’t take responsibility for managing projects and activities inside and outside the classroom. Faculty also discussed ways how these issues could be overcome. Nevertheless, teachers of the Chemistry Faculty highlighted a number of SCL approach benefits, namely:

- Achieving a better understanding by students of what they are doing and why – 28 persons (65%)
- Development of critical thinking and creativity in students – 28 persons (65%)
- Achieving greater student activity in acquiring knowledge and skills – 24 persons (55.8%)
- Continuous professional development of academic staff – 10 persons (23.2%)

## Conclusion

This research found that teachers of the Chemistry Faculty of the Karaganda Buketov University are familiar with many different aspects of SCL. However, academic staff needs to participate in professional training programmes, which will acquaint them with pedagogic and didactic issues and facilitate their personal development. The research did not investigate readiness for SCL from the student’s perspective (because this was beyond the scope of the study) but it would be useful and could show if students have the same opinion about SCL as teachers. Next, we also plan to develop a new questionnaire and conduct research in the natural sciences and humanities faculties of the Karaganda Buketov University. The obtained findings were discussed at the Academic Council of the Chemistry Faculty. It developed a number of recommendations to improve the practice of using innovative teaching methods in the Chemistry Faculty. Teachers of a modern university should follow innovative trends, constantly improve and develop. In the educational process, it is desirable to

combine passive, active and interactive teaching methods, while the choice of teaching methods should be carried out by the teacher and depend on the topic (content) of the lesson, the purpose and main objectives of training. Only continuous improvement of teaching and assessment methods will make it possible to achieve a high quality of training for graduates from multidisciplinary universities.

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