

ICEST 2021**II International Conference on Economic and Social Trends for Sustainability of Modern Society****RATING SYSTEM FOR STUDENT CONSTRUCTION UNITS
PARTICIPANTS**

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Abstract

Student construction units (SCU) are a form of temporary employment for young students and a significant source of professional and competent personnel for the construction industry. The authors of the research revealed that the SCU headquarters of educational organizations are in dire need of a system that facilitates the adoption of sound management decisions regarding the formation and rotation of SCU personnel, providing the ability to quickly monitor the activities of participants, which allows ranking candidates and SCU participants in accordance with their labor and intellectual contribution. As one of the options for such a system, one can consider the rating assessment of participants of student construction units developed by the authors of the research and introduced into the organization of the work of the SCU Headquarters of the Moscow State University of Civil Engineering - National Research University (MSUCE) in 2015. Since 2015, the system has been continuously improved, and most management decisions were made by the Headquarters of the SCU MSUCE on its basis. The result of the introduction of a rating assessment of participants of student construction units was a significant simplification of the processes for assessing the quality and depth of involvement of university students in the development of the SCU movement of the Moscow State University of Civil Engineering. The transparency and validity of the management decisions made by the Headquarters has significantly increased, and the degree of personal influence of the staff of the Headquarters apparatus on these decisions has significantly decreased.

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Keywords: Student construction units, SCU movement, rating system, assessing SCU participants

1. Introduction

Vocational training of students of higher educational institutions of construction profile is impossible without creation of conditions of industrial adaptation of future specialists. Since the times of the USSR, one of the most effective forms of professional training, adaptation, socialization of students remains the movement of student construction units (SCU) (Rychkova, 2020). At the peak of development, the movement consisted of more than 800,000 people, while not all participants in the SCU movement were construction students.

Since the beginning of the 1960s, the directions of guides, teachers, farmers, doctors have been developed. In the 2000s, the service direction of student units began to actively develop (Koroleva & Kobtceva, 2016). In this regard, it is more appropriate to talk about the All-Russian movement of student units (SU) and its structural direction - student construction units (SCU). Today, the SU movement, managed by the Youth All-Russian Public Organization Russian Student Units (RSU) (Morozov & Pleshakov, 2013), is one of the most numerous youth associations. The annual number of SU participants in the Russian Federation is stable at 240,000 people per year.

2. Problem Statement

The mass, wide range of activities is forcing the development of unique technologies for organizing the work of SU governing bodies at all levels. Revived in its modern form at the MSUCE in 2011, the Headquarters of Student Construction Units (Headquarters of the SCU MSUCE, Headquarters) is initially in the urgent need to develop and implement advanced forms of organization of the production process.

The first stage was the formation of the staff organizational structure of the SCU MSUCE movement (Voronkov & Ostrovskii, 2020). Contrary to the criticism of a number of specialists, this decision ensured the survival of the movement in its early stages. The redistribution of resources between individual linear student construction units that do not yet have their own history, traditions, consolidation of experience, a clear definition of the hierarchy of goals (Melik-Gaykazyan, 2010) created the conditions for the development of the movement.

A systematic study in 2011-2014 by the authors of a research of the all-Russian experience in organizing the activities of the governing bodies of the SCU headquarters in an educational organization revealed:

- actual absence of uniform standards for organization of SCU headquarters activities;
- fundamental regional, historical and ideological differences in the approaches and tools of the SCU movement management.

These contradictions were a significant obstacle to the standardization and unification of the activities of the university headquarters of the SCU. In the conditions of fierce internal competition in the labor market, the conditions for the transfer of organizational and management technologies for the MSUCE were extremely unfavorable. In the current situation, the import of existing technologies and mechanisms for monitoring and accounting for the activity of participants in the SCU movement seemed

unfeasible to the Headquarters. The need to independently develop and implement such organizational tools in the organization of the Headquarters's activities has become obvious.

3. Research Questions

Having solved the problem of survival and staffing (Treschetkin, 2019) of the governing bodies of the Headquarters, the task of developing the SCU movement of the MSUCE was acute. In the framework of solving this problem, the authors of the research, who at that time held senior positions in the structure of the Headquarters apparatus, had the following questions:

- Ensuring a systematic increase in the number of SCU participants;
- Creation of an effective system of formation and rotation of movement personnel;
- Increasing the quality of professional and personal training of students;
- Involving SCU MSUCE in the implementation of more large-scale construction projects;
- Achievement of significant successes of the Headquarters within the movement of student units of Moscow.
- Increasing the confidence of university students in the activities of the Headquarters.

The solution of these issues should reflect the principles of systematics and consistency, as well as take into account the organizational characteristics and traditions of the SCU movement of the MSUCE at that time.

4. Purpose of the Study

The purpose of the research was the formation of methodological foundations, the design and introduction into the activities of the Headquarters of the SCU MSUCE of a rating system for participants of student construction units. The core of this system was to be a deterministic model that allows assessing the labor, intellectual, sports and organizational contribution of each participant in the SCU movement of the university to the development of the SCU Headquarters of the MSUCE.

Based on the accumulated experience, advanced approaches to organizing the activities of the labor collective, the existing tradition and history of the movement of the SCU MSUCE, the leadership of the Headquarters in 2016 developed, introduced and subsequently developed a system of rating assessment (SRA) of participants of student construction units. The purpose of the system was to create the conditions for making the most informed management decisions by an impartial and objective assessment of the contribution, merits and volume of encouragement received by each participant in the SCU MSUCE movement.

The tasks of this system were:

- Creation of a toolkit for qualitative and quantitative assessment of the details of candidates, participants and veterans of the SCU MSUCE movement of different nature, intensity and specificity;

- Reduction of personal influence of staff of the Headquarters on the process of management decisions making (Fedorov, 2020);
- Creation of a statistical database on the SCU movement participants, which allows to form informed decisions on the formation of linear SCU, as well as the appointment of the most distinguished SCU MSUCE participants of Increased State Academic Scholarship (ISAS) (Nizov, 2018) for special achievements in public activities;
- Ensuring transparency and openness of the selection processes, encouraging the most distinguished representatives of the movement, as well as preventing cases of receiving a cascade of incentives by an individual participant in the SCU movement;
- Increase of reliability of functioning of both individual linear SCU of MSUCE (LSU) and Headquarters as a whole.

When developing the SRA, the traditions of the SCU Headquarters of the MSUCE formed by that time were taken into account, the experience of personal interaction of employees of the Headquarters apparatus with line participants and LSU commanders was taken into account.

5. Research Methods

Until 2014, the Headquarters apparatus actually did not have effective tools for operational and synchronous interaction with candidates and participants of the SCU. The key way to organize this interaction was direct telephone calls from Headquarters employees to SCU participants. Under these conditions, it was impossible to quickly and systematically interact with all participants in the movement. In this regard, in 2011-2014, the organizational process was based mainly on the hierarchical interaction of the Headquarters with the commanding staff of linear SCU and further with individual participants.

In 2015, a significant driver in improving the processes of interaction between the apparatus of the Headquarters of the SCU MSUCE with candidates and participants gave the appearance of the possibility of creating group conversations on the «Vkontakte» social network (Ermolaev, 2017). This tool, initially limited to the number of participants, fundamentally changed the mechanisms of interaction between the control and executive subsystems of the SCU MSUCE. The need for telephone communication was nullified, and the speed of information dissemination increased tenfold.

The reverse side of this change was a significant weakening of the role of the command staff of the LSU, which lost the monopoly on the information interaction of the units with the Headquarters. On the other hand, the removal of the functions of informing participants and candidates from the command staff of the line units, solving the operational tasks of the Headquarters, allowed them to concentrate on solving internal issues and developing the spirit of "classical student units" within the framework of the linear SCU of the MSUCE.

Both periods (2011-2014 and 2015-2020) allowed the staff of the Headquarters of the SCU MSUCE to form the most objective idea of the state and evolution of the motivational consciousness of university students interested in joining the SCU. Understanding the reasons for the interest, expectations and the possible degree of dedication of candidates and participants of the SCU of the MSUCE made it possible to build the RA system in such a way as to satisfy the information needs of the participants in the movement

and form an atmosphere of healthy competition and confidence in the objectivity of management decisions made by the Headquarters.

From the methodological positions of the SRA and the mechanism of its application had to fully comply with the hierarchy of the goals of the movement adopted by the SCU MSUCE Headquarters, the most modern methods and forms of organization of the production process adopted in the SCU movement, take into account the principles of the concept of lean production implemented by the SCU MSUCE Headquarters (Sergeev, 2016), as well as established SMART-goals (Filatov & Oshkalo, 2016). Thus, the SRA was developed and implemented in clear accordance with the results-based management strategy implemented by the SCU Headquarters (Kuzmin & Visokovskaya, 2015).

In the process of developing the RA system, the authors of the study analyzed the experience of involving participants of the SCU MSUCE in the implementation of the most large-scale investment and construction projects of our time. By 2015, the SCU MSUCE movement made its efforts to build Olympic facilities in Sochi, Novovoronezh AES-2, Nizhne-Bureya and Zaramag hydroelectric power stations, Cherepovets GRES, Vostochny and Plesetsk spaceports. Feedback received from receiving organizations, results of works performance by SCU MSUCE participants, level of preparation and participation in cultural and creative activities of labor projects of RSU were aggregated and used in designing the RA system.

6. Findings

The developed RA mechanism was an integrated consideration of a wide range of performance indicators of SCU participants. It was first implemented in preparation for the third labor semester (TLS) (Lunin, 2020) of the SCU MSUCE 2015 and was systematically transformed until 2019 inclusive. The RA of the participants of the SCU MSUCE assumed the calculation of the individual coefficient (total score) of the candidate, participants, veteran of the SCU MSUCE and the subsequent ranking of all participants in the movement according to this indicator. The formula for calculating the individual coefficient of the SCU MSUCE movement participant in general form is presented below.

$$W = F_{\text{HELP}} + F_{\text{SC}} + F_{\text{PROF}} + F_{\text{OFE}} + F_{\text{FT}} + F_{\text{TLS}} + F_{\text{MED}} + F_{\text{SE}} + F_{\text{RSU}} - F_{\text{REW}} - F_{\text{ISAS}} - F_{\text{PEN}}$$

F_{HELP} - the aggregate indicator of the contribution of the movement participant to the process activities Headquarters of the SCU MSUCE. The calculation of this indicator took into account the operational tasks entrusted by the Headquarters and the personnel of the LSU to the participants in the movement. To ensure a unified system for measuring the labor contribution, when calculating this coefficient, the Headquarters introduced a norm of time 1 point for 4 hours of activities. In cases where it was impossible to accurately normalize the mandated activities, the Headquarters established specific values of the possible for the appointment of a score for the execution of the assignment.

F_{SC} - the aggregate indicator of the candidate's attendance in the SCU participant of the School of SCU of the MSUCE (Voronkov et al., 2020) and the success of material development. The calculation of this indicator was made on the basis of summing up the number of visits by the candidate to the School's events. For attending one meeting, 1 point was assigned.

F_{PROF} - the aggregate indicator of the candidate for SCU participant mastering the working profession, carried out as part of the joint project of SCU MSUCE and NOU DPO "UCPR" "To Engineer - Working Profession" (Gamov et al., 2020). The value of the score was determined by the Headquarters apparatus based on the results of mastering the professional program.

F_{OFFE} - the aggregate indicator of a participant of the SCU MSUCE movement in the official events of the SCU MSUCE. Such events traditionally included the Conference, the Solemn Line, the Meeting of the SCU MSUCE, the Feast of the first-year students of the MSUCE. At the same time, from year to year, a set of additional events was adjusted, active participation in the organization and conduct of which was taken by the Headquarters of the SCU MSUCE. The value of the SCU movement participant's score for participation in these events was determined by the Headquarters depending on the student's role in the event, his labor contribution and the quality of the work performed.

F_{FT} - the aggregate indicator characterizing the level participation of a participant of the SCU MSUCE movement in field training organized by the Headquarters. By analogy with F_{OFFE} , the number of points assigned for participation in these events was carried out by the SCU of the MSUCE Headquarters on the basis of a comprehensive assessment of the level of participation of the student in the event.

F_{TLS} - the aggregate indicator of the performance of works of the SCU MSUCE participant in the third labor semester of student construction units. The calculation of this indicator was carried out on the basis of the Regulation on the competition of LSU MSUCE. As part of this competition, the assessment of the activities of the SCU participant was carried out by the command staff of the LSU (commander, commissar, master), as well as the Headquarters of the SCU MSUCE. The formula for calculating F_{TLS} in general vision is presented below.

$$F_{\text{TLS}} = K_{\text{CH}} \frac{K_{\text{KM}} + K_{\text{KS}} + K_{\text{M}}}{3}$$

where K_{KM} , K_{KS} , K_{M} are coefficients assigned to LSU participant respectively by the commander, commissar, master of LSU. The calculation of each coefficient was carried out by an independent analysis by each member of the command staff of the unit of such aspects of the activities of participant s as "Participation in the life of the unit," "Participation in the events of All-Russian, zonal, regional student buildings," "Discipline," "Labor activity." The interval of K_{KM} , K_{KS} , K_{M} values was accepted from "-3" to "+10".

K_{CH} - correction coefficient set for the entire linear student units by the Chief of Headquarters of the SCU MSUCE in agreement with the Council of the SCU MSUCE in accordance with the results of the LSU activities in the TLS. The values of this coefficient ranged from "0.8" to "1.5."

F_{MED} - the aggregate indicator of the "media" activity of a participant in the SCU movement. Throughout, a systematic assessment of the activity of students on social networks, their contribution to the promotion of the SCU MSUCE brand on the Internet was carried out. Within the framework of this direction, working groups were formed to promote the official group SCU MSUCE in the social network "Vkontakte", account in "Instagram".

F_{SE} - the aggregate indicator of the student's contribution to the organization and conduct of sports events, as well as the presentation of the SCU MSUCE at sports events.


F_{RSU} - the aggregate indicator of the student's participation in the activities carried out by the Youth All-Russian Public Organization Russian Student Units. When calculating this coefficient, the list of these events excluded activities in which participation was in the nature of encouragement, for example, the annual All-Russian meeting of student units (Shapovalov, 2013).

F_{REW} - value reflecting the total amount of rewards received by the trainee at the initiative of the SCU Headquarters. Such incentives included participation in iconic field events of the SCU (District Schools of the RSU, the annual All-Russian meeting of student units, the traditional meeting of the SCU MSUCE), as well as receiving awards, petitions and other incentive measures by the SCU Headquarters.

F_{ISAS} - value reflecting the total amount of ISAS paid to the student. The value of this indicator was determined on the basis of one thousand rubles paid under the ISAS is 1 point.

F_{PEN} - the aggregate indicator of penalties imposed on a participant of the SCU movement. The values of this indicator were determined by the nature and severity of the misconduct committed by candidates, participants and veterans of the SCU MSUCE. For the period from 2015 to 2019, there were only some cases of violations by participants and candidates of the charter and rules of the SCU of the MSUCE, in connection with which this coefficient was used extremely rarely in calculations.

The final calculation of the individual coefficient of the SCU MSUCE movement participant was carried out in tabular form using the Microsoft Excel office application. The basis for the introduction of up-to-date data into the rating system was the "Resolutions on the Promotion of Students of the MSUCE " issued by the Headquarters apparatus, signed by the commander and commissar of the Headquarters of the MSUCE. An example of such a resolution is presented in Figure 1.



HEADQUARTERS OF STUDENT CONSTRUCTION UNITS MSUCE

RESOLUTION

dated _____ year № _____

MSUCE, Moscow

Subject of the resolution

The Headquarters of student construction units of the MSUCE **decides:**

Text of the resolution

№	Surname	Name	Middle name	Institute/ Course/ Group	Total points awarded
1					
2					
3					

Commissar of Headquarters
SCU MSUCE
(position)

Chief of Headquarters
SCU MSUCE
(position)

(signature)

(signature)

R.V. Ostrovskii
(name)

I.E. Voronkov
(name)

Responsible:
Telephone No.:

Figure 1. Resolutions of the Headquarters SCU of the MSUCE "On the Promotion of Students of the MSUCE "

Following the inclusion in the summary table of up-to-date information about the activities of participants in the SCU movement, their ranking took place. Current RA data were systematically published by the Headquarters apparatus in the official group SCU MSUCE on the social network "Vkontakte," which provided access to them to any participant in the SCU movement of the university.

Due to a systematic decrease in the indicator of the individual coefficient of the most active candidates, participants and veterans who received certain measures of encouragement or submitted to the calculation of ISAS, it was possible to quickly rotate the top list of the rating. Thus, cases of one person receiving a "cascade" of incentives were excluded - situations where the same person could consistently receive a series of significant incentives, while others were undeservedly forgotten.

7. Conclusion

The formation of a rating system for participants of student construction units allowed the Headquarters of the SCU MSUCE to put into operation a transparent and effective tool for monitoring and evaluating the activities of participants in the SCU movement. At an early stage, the advantages of an impersonal assessment of the contribution of participants in the SCU movement were clearly manifested. It was possible to significantly increase the interest of students in performing systemic activities throughout the school year. Candidates, participants and veterans of the SCU could in real time track the dynamics of both their own activity indicator and similar values of other participants in the SCU movement. The introduction of the system is stimulated by the formation of an atmosphere of healthy competition within the framework of the university movement of the SCU.

The formation of the personnel of the LSU, carried out on the basis of both the preferences of the candidates and the values of their total score, transformed the procedure for the formation of the LSU into an open and impartial process, understandable to all participants in the SCU MSUCE movement. Additional advantages of the RA implementation were the reduction of the probability of unscrupulous participants entering the list of LSU and the general increase in the quality of LSU training.

The system of rating assessment of participants developed by the Headquarters of the SCU MSUCE was actually the first mechanism introduced in the MSUCE to evaluate the public activities of university students. The use of this system allowed the SCU Headquarters to make extremely reasonable decisions on the presentation of students of the MSUCE to the awards of the university, the RSU, the State Atomic Energy Corporation Rosatom, as well as other official partners of the SCU MSUCE.

The use of the RA system made a significant contribution to the achievement by the SCU Headquarters of the MSUCE of the title of the best headquarters of student units of the educational organization of the city of Moscow in 2014, 2017, 2018.

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