

Student-staff partnership achievements and challenges at the National University of Science and Technology MISIS

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Abstract

This article is a case study describing and analysing approaches to setting up student-staff partnership as an integral component of the learning community at the National University of Science and Technology MISIS, while taking into consideration specifics of the Russian educational system. The authors emphasise the need for the institution's leadership to be actively involved in enabling interactions between staff and students, not only within separate projects or disciplines but also at the level of the entire university ecosystem. This includes formal and informal learning, social and research-based activities, and innovative pedagogical approaches, as well as contemporary, state-of-the-art learning spaces.

Introduction

In this case study we analyse how particular attitudes inform the transformation of the learning culture at the National University of Science and Technology (NUST) MISIS by integrating student-staff partnership (SSP), while taking into consideration specifics of the Russian educational system. NUST MISIS is one of the foremost engineering universities in Russia, with historic expertise in materials science, metallurgy, and mining, as well as more recently developed strengths in biomaterials, nano and information technologies, and quantum technologies.

Traditionally, attitudes regarding partnership reflected the belief that students and staff could collaborate effectively only on extracurricular activities, with practically no possibility of working together in teaching and learning. This long-held conviction was based on the understanding of the teacher as the indisputable authority, which accordingly neither allowed room for the student voice in the decision-making process, nor regarded constructive criticism and open dialog as positive learning instruments.

To inculcate SSP at NUST MISIS, it is necessary to nurture the approach of embracing equality and contribution from both partners in various forms of interaction. According to expert consideration, the development of a culture of equally shared contribution among students and staff is the primary means for creating a meaningful, mutually beneficial partnership (Bovill, 2017). In most cases described in the available literature, partnership is the result of informal learning projects and activities frequently organised by a team of enthusiastic staff on the level of separate administrative entities within the university (Holen et al., 2021; Mercer-Mapstone & Bovill, 2020). But the relevant scholarship also refers to other, alternative forms of SSP (Mercer-Mapstone et al., 2017; Healey et al., 2014). Based on our analysis of current practices at NUST MISIS, we are now at the stage of establishing two of Healey, Flint, and Harrington's (2014) forms of SSP: subject-based research and

inquiry along with learning, teaching, and assessment. To supplement these, we are developing two more approaches: administration-led partnership and student-led partnership.

In the following sections we look at each of these forms in greater detail, focusing on the attitudes that facilitate and hinder their development.

Existing attitudes that foster and hinder the development of student-staff partnership at NUST MISIS

Two views that have long informed post-Soviet higher education regard teachers as the highest authority and most important source of knowledge and experience and thus assert that their priority ought to be the efficient management of quite heavy workloads. At the same time SSP attitudes require recognising that students also have a voice, as well as investing time and effort in developing relationships with them.

The greatest challenge pertains to the non-accepting attitude of many teachers, who knowingly or subconsciously reject the role of students as partners, and are unwilling to recognise students' ability to enrich and add value to teaching and learning. As a result, transitioning to the new format of collaboration with students appears to be extremely difficult for many of our educators, both from the perspective of changing the previous mentality and of mastering new pedagogical techniques. Another specific feature of Russian HE is a heavy teaching load that involves nine hundred contact hours of lectures and seminars per year. Besides this, staff employment contracts also necessarily contain research, methodological, and administrative responsibilities. Therefore, this model of higher education is not conducive to the establishment of sustainable SSP.

Yet in recent years we have noticed considerable progress in this area. For example, being digital natives, contemporary students often act as experts and can make significant contributions in projects that require the use of digital technologies. Digitalisation expands the opportunities for cooperation between teachers and students in teaching and learning as well as in research projects, which helps increase teachers' trust in the abilities of students. At the same time students have come to assume responsibility for their own learning and future success. In addition, over the past decade the average age of staff at the NUST MISIS has been steadily reduced, and new, younger teachers almost always appreciate the opportunity to engage in team projects with students. The happy combination of students who are increasingly conscious of their own powerful voice in influencing the learning community and teachers who are willing to share authority and understand the inherent value of teamwork reflects a change of attitude by both parties that promises further enhancement of learning. The attitude that staff bring to this endeavour, namely that relationships with students and fostering meaningful learning are more important than efficiency and the advancement of one's own career, is conducive to partnership, although at odds with established university culture.

Building on the promising attitudes we see among some staff and considering how to manage the inherited stereotypes that hinder the development of SSP, in the following

section we examine in greater detail different methods for developing several forms of SSP at NUST MISIS.

Subject-based research and inquiry in the context of student-staff partnership

As a research-intensive institution, NUST MISIS is vitally interested in both the quality and quantity of post-graduate students, who at present comprise 60% of the total enrolment. To attract post-graduate students, we strive to provide opportunities for deep immersion into R&D starting from the first year of undergraduate study. In this respect, all students are immersed in research activities in the academic department of the disciplined-based college from which they intend to graduate. Beginning from the third year of study, students are involved in cross-disciplinary research projects and assist scientists with the commercialization of their discoveries and inventions. In short, such collaboration takes mentored research to a different, more nuanced level of genuine, co-equal partnership. To provide a creative environment for SSP in R&D and increase students' internal motivation to pursue research, while identifying and following their own path along the student journey, NUST MISIS offers a variety of scientific activities. One of the most meaningful is [MISIS Science Slam](#), which entails a competition for young scientists in the format of a popular science stand up, whereby the contestants must describe their current research project in only ten minutes. The informal setting helps break down social barriers between students and scientists and thereby facilitates teamwork and encourages all participants to generate new ideas.

The role of the [Student Scientific Society](#) is especially significant in attracting young people to careers in R&D. Students interact with staff mentors to organise and conduct primarily extracurricular activities that popularise science and recruit new prospective team members for collaboration in laboratories. In this instance, student members often take the lead in proposing events and projects, some of which have an international agenda. As staff make space for and support student initiatives, their role expands from being discipline-based mentors and counsellors to supporting students in developing and practising leadership skills.

According to student evaluations, the opportunity to engage in applied science while studying at NUST MISIS inspires them to become changemakers and strive to improve the future. For example, a student in our master's programme on biomaterials science states:

“Having enrolled in NUST MISIS, I saw first-hand the opportunities readily available to young scientists and wanted to prove myself in scientific investigation. Since my initial year as a master's student, I have been involved in a team project developing biomaterials for prosthetics under the mentorship of leading scientists from various organisations. This unique experience has underscored for me the importance of being well prepared for employment and the accompanying responsibilities. As a result, I now dream of assembling in the future a team of talented scientists from a variety of fields and then together changing the world for the better.”

During the entire three-year period of this programme the student with constant energy and vigour participated in an international team that served as an inspiring role model for others.

Presently a doctoral student, she is well prepared to realise her dream of gathering a diverse team of beginning and experienced researchers for pursuing their own scientific agenda.

Learning, teaching, and assessment in the form of student-staff partnership

The development of SSP in the form of learning, teaching, and assessment at NUST MISIS is primarily connected to the creation of fundamentally new learning opportunities, the implementation of which inherently entails different means of student-staff interaction. In essence, it means that teachers must transform their methodology and accept the role of students as co-authors of learning approaches, course design, and curricula development (Bovill et al., 2011). Teaching success directly depends on the acceptance and encouragement of students' initiatives and the willingness to implement their views in working together for the enhancement of the learning environment.

The innovative nature of new learning opportunities consists in their orientation on break-through scientific fields (such as personal digital fabrication, 3D food printing, bio implants, new composite materials, and quantum technologies) involving external guest speakers and introducing modular structure of educational programmes, in which each module challenges participants to solve real-world problems and culminates with online or offline exhibits depicting the results of the students' efforts. For instance, master's students in the NUST MISIS laboratory of personal digital fabrication (Fablab) under the supervision of Professor of Architectural Design and Stereotomy, Giuseppe Fallacara from the Politecnico di Bari, Italy [created an exhibit](#) open to the public as the final product of their intensive module. Similarly, students in the master's programme, entitled "Technological art," exhibited their projects at an open venue called [ArtTECH HYBRID](#). Collaborating on public exhibits and presentations puts all participants on an equal footing and enables everyone to make an individual contribution to the benefit of the whole collective. Equally significant, the added excitement and stress of performing publicly, if handled judiciously, forges stronger bonds among team members and has a positive impact of social levelling, thereby rendering harmless potentially unhealthy hierarchical relations. These opportunities foster SSP by empowering students with shared responsibility for their successful realisation and providing valuable experience in teamwork and social interactions.

Another NUST MISIS endeavour in the context of SSP is our integrated iPhD in biomaterials science. This five-year programme entails earning both MS and PhD degrees and cuts across biology, materials science, and medicine. Participants work in teams to produce medical equipment and create medicines that effectively save lives (such as 3D-printing of organs, implants with memory of form, "smart" materials, and on-point delivery of medications, among others). Both mentors and students in this programme have embraced the attitude that only by trusting each other will they be able to produce new and improved medical devices for public use.

Learning in the above-mentioned programmes is noted for a high degree of variability within a multidisciplinary framework that enables students to make informed choices. In this situation students become more conscious of their learning and develop personal responsibility for their decisions. This approach is inherently conducive to a network of SSP across the curriculum based on horizontal connections between learners and mentors.

Besides accumulating crucial experience in devising, implementing, and managing projects that focus on meeting real-world challenges, the participants play various roles in teams. While the projects are grounded in science and technology, interdisciplinarity is further reinforced because of the need to analyse problems from multiple perspectives that include ethical and socioeconomic factors.

At the same time we at NUST MISIS understand that the successful realisation of SSP also requires providing state-of-the-art learning spaces and facilities. Included in this provision is the need to devote attention and financial resources to extracurricular learning and cultural and recreational spaces, along with facilities for socialisation, thus helping to ensure the sustainable development of our learning community.

Administration-led partnership

The question of student representation on various staff-led administrative committees of the university has been discussed for an extended period, but the matter takes on another dimension in the framework of SSP. In this section we examine projects at NUST MISIS designed to enhance collaboration between administrative staff, on the one hand, and research and teaching staff along with students, on the other. These activities are intended to encourage student initiatives and in general further solidify the cohesion and unity of the learning community.

A central means of establishing and maintaining a welcoming and comfortable learning community at NUST MISIS is a project known as the [open rectorate](#), or in other words, a town hall meeting that occurs twice a year. These interactive sessions give students at all educational levels the opportunity to question senior staff on matters of concern and interest, such as the ongoing evolution of the strategic plan, changes in stipends and other types of financial assistance, continual facilities improvement, and short- and long-term employment trends. The format lends itself to dialog and discussion, for there are no lectures or presentations, and students themselves are free to comment on all aspects of university life. In this way the NUST MISIS leadership receives direct feedback from students that contributes to informed decision making. In our view, this open dialog between senior staff and students provides a solid foundation for SSP in all domains of the learning community, for it reinforces the principle of shared governance among all stakeholders.

Based on our practice at NUST MISIS, we believe that SSP initially conceived by the central administration positively changes and further enhances the learning community. Yet we argue that this form of SSP ought not be considered primary because it can be bureaucratic and even politicised.

Student-led partnership

SSP can also arise because of students' initiatives that usually reflect their self-confidence in meeting specific challenges for which at the outset staff seem less knowledgeable and skilful. For example, at NUST MISIS a student-initiated endeavour, known as "Digital Volunteering," helped maintain the quality of the learning process in the 2020 fall semester in reaction to the COVID-19 pandemic. To guarantee equality of opportunity for all learners and

reduce the anxiety and stress for staff unfamiliar with digital technologies, students established a headquarters of digital volunteers, who functioned as technical troubleshooters to insure that equipment functioned appropriately. By the end of the 2020 fall semester a student group of approximately one hundred digital volunteers had assisted in the successful delivery of more than 1,500 hybrid lessons. Equally important, the informal service club of “Digital Volunteering” continued to function in 2021-22, with ongoing communication between the digital-native student volunteers and staff in need of their expert assistance.

In our experience, while student-led partnership with staff has the greater, more transformational value, it is also more fragile because of dependency on mutual interest and benefit. Therefore, the university leadership is strongly urged to support student initiatives conducive to enhancing partnership with staff and laying the foundation for continual student creativity in this domain.

Conclusion

Despite certain success stories at NUST MISIS to promote sustainable SSP, we emphasise the need for the institution’s leadership to be actively involved in enabling interactions between staff and students not only within separate projects or disciplines but also at the level of the entire university ecosystem, which includes formal and informal learning, social and research-based activities, and innovative pedagogical approaches, as well as contemporary, state-of-the-art learning spaces. Attitudinal changes must be based on joint contributions in various partnering activities between students and staff; staff recognition and acceptance of students as co-creators and co-owners of the learning process; and staff encouragement and promotion of student initiatives in institutional advancement, along with the acknowledgement that students are equal partners in shared governance.

We also recommend that the sustained development of SSP in learning, teaching, and assessment necessitates recalculating the structure and volume of staff instructional load, while realistically re-appraising the amount of time required to assimilate new means of interacting with students. Such a recalculation requires a shift in attitude from prioritising efficiency in managing heavy workloads to building relationships and fostering learning experiences in which students can have agency.

To implement the principles and practices of SSP successfully, we believe that the corresponding policy must be included in the institution’s strategic plan. In this context, incoming first-year bachelor’s students ought to participate in relevant activities and expect that the main features of SSP will be continued annually throughout their entire journey to graduation.

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