Articles

Russia Develops Educational Standards for Higher Vocational Training in the Technology and Entrepeneurship Specialty

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This article may not bring the reader to a sense of closure, or a conclusion as to what will happen in Russian vocational education. It does offer insight into what Russian educators are facing on a daily basis as they try and find and pursue the best course of action as they attempt to create a curriculum that will address the major needs of Russian society now and in the immediate future. This article may make more impact on our readers if they knew that the average salary that a Russian university professor makes is equal to one U.S. dollar a day, or that most schools either have no computers or ones that can only run DOS programs, or that Internet access is still a dream of the future for most Russian students and professionals.

This article presents issues related to training teachers of technology and entrepreneurship in Russia's higher educational establishments, that is, those who will actually represent in 1st to 11th forms of Russia's general schools technological units, assigned to the technology educational field.

Technology, as a part of general education, ensures that the school children acquire technological competence, being in tandem with skills to master diversified means and ways to transform and transfer materials, energy, and data; to estimate the economy's efficiency and possible environmental implications of technological activity; and to set up their own course for life and career. It facilitates building up general skills and habits of work, simultaneously develops creativity, and enables the tackling of practical problems. In the system of general education, technology is aimed so that the school children are able to:

- Form technological knowledge and skills as the basis for successful creative and developing activity.
- Acquire inner need and deferential treatment of work and its products.
- Acquaint themselves with different types of vocational activity and contribute to their career self-determination.
- Reveal and develop creativity; build up and widen their cognitive interest.
- Form their working, graphical, business, ecological, informative, ethic, and esthetic culture.
- Enjoy every opportunity for self-actualization, self-assertion, and socialization.

Used to this effect, technology concurs to develop wholeness of one's personality, har-monically combining inner need for both physical and mental work, continuous self-education, and self-development.

In Russia, teachers of technology are being trained in 69 pedagogical universities at the faculties of technology and entrepreneurship. Their training, in respect to future pedagogical specialty, is governed by the State Educational Standard for Higher Vocational Training (SESHVT). To educate a teacher, SESHVT includes the following sections:

- General humanitarian and socioeconomical disciplines (philosophy, history, sociology, economy, etc.) – 1,500 hr.
- General mathematical and natural-science disciplines (higher mathematics, physics, chemistry, etc.) – 1,000 hr.
- General vocational disciplines (pedagogy, psychology, teaching methodology, etc.) – 1,600 hr.
- Disciplines of subject training (engineering science, electro-radio engineering, technological practical training, infotechnologies, marketing, management, etc.) – 4,334 hr., including 900 hr. taken by disciplines referred to as a specialization.

In addition, there are standards developed to acquire both basic and optional specialties.

When, in 2000, the Ministry of Education of the Russian Federation adopted SESHVT for the second generation, it actually meant reviewing the achievements and starting a new essential stage of theoretical and practical work in the

field. Its results, worded in the respective standard regulations, teaching and methodological documentations, that is, curricula, educational programs, textbooks, training aids, methodological recommendations, etc., shall govern training of a specialist-teacher in the near future. Now within the university level, where the powers have been delegated, the issue of SESHVT's unambiguous interpretation has definitely become of prime importance. In view of this we, as the authors of SESHVT on the technology and entrepreneurship specialty, would like to dwell on certain conceptual notions, actually the staple of standard's development and application.

Presently, there is no uniformity among Russia's analysts in regard to how to treat issues of higher education standardization. And, standardization of higher pedagogical education as a subsystem of the general higher vocational education is definitely not an exception. In our opinion, SESHVT, specifying general parameters and requirements to train a specialist-teacher, can be considered as a methodological foundation for functioning and developing the respective educational system. That is why, taking a teacher of technology and entrepreneurship training as an example, we have been governed by the absolute importance, necessity, and expedience to draw up a federal regulatory document in view of the:

1. Insistent need to preserve education uniformity and, consequently, to ensure similarity of educational programs applied by Russia's pedagogical universities concerning their aims, objectives, requirements, and results of training a specialist-teacher.
2. Strategic significance to legislatively support academic freedom of universities, related to their self-independence in forming the whole package of documents to determine the respective educational program.

It is worth pointing out that practical implementation of the first requirement should in no way imply the absolute uniformity of university educational programs identical training of teachers based on previous years' common curricula. Equally, meeting the second requirement will not justify unlimited educational freedom of the 90s. In other words, we regard the state standard as some sort of controller to maintain the required data balance, theoretically exclusive concepts, which dialectical uniformity makes it possible to establish a functioning system of democratic education.

We believe, and have used this as conceptual footing to develop the standard, that in the foreseeable future Russia's higher pedagogical education should be primarily oriented toward university education of a degree-holder specialist. This assumption has not been inspired by conservatism, the fashion of today; it has actually resulted from tough-minded and thorough analysis of Russia's education system. To a certain extent, such a classical introduction of the issue might seem too evident, so we would like to pinpoint that not only does it correspond to the traditional system of education in Russia and meet requirements of the general school, but it also forms a natural basis to modernize the entire system.

Moreover, the above-stated assumption implies our answer to the question concerning the least required educational level for a teacher to effect technological education in the school. The law of the Russian Federation on Higher Vocational Education stipulates three stages of education each of which should be sufficient to confer a certain degree or qualification to a university graduate. What we are driving at is a bachelor's degree (qualification), degree-holder specialist qualification, and a master's degree (qualification).

Unfortunately, the law does not differentiate between a bachelor's or master's qualification and degree. Nor does it comprehensively specify whether bachelors and masters are to be simul-taneously educated for a degree and qualification. These abstrusities complicate the practical implementation of law-stipulated patterns of education, where diversity should theoretically enable a graduate to individually set up his or her educational trajectory. Not only, and it is its major advantage, can he or she pass "stages" in a strictly limited one-way direction, but he or she as well can get out of, or even alter direction within, a unit of the educational trajectory.

As it is, these patterns are far from being entirely realized in all spheres of professional activity due to the inequal demands required of graduates, determined by the peculiarities of their respective field. Quite often it results in system contradictions, solved only by generalizing further practical experience. To illustrate this point, let's analyze as an example the place of a "teacher-bachelor" in general education. In Russia, a school "discipline teacher" is assigned to the main subject; traditionally the position is taken by a specialist-teacher, holding a degree corresponding to the particular discipline. Other appointments, requiring lower qualification such as tutors, assistant-teachers, etc., are simply not available in Russia's modern school system. Qualified bachelors "added" to a specialist-teacher at Russia's schools will drastically imbalance the latter. Teachers with different professional backgrounds could apply for similar positions. But, equal professional duties evidently presuppose equal qualification.

Therefore, it seems justified to acknowledge that there is no need for graduate teachers with a bachelor qualification. Otherwise, mere admission of a bachelor-teacher to a school might threaten training of the more "expensive" specialist-teacher, with similar academic, but considerably higher, professional level. This would lead to a trivial reduction in teachers' educational qualifications and the subsequent general decline in Russia's entire educational system.

The approach mentioned above should not be considered as an attempt to generally abandon training of the bachelor-teacher. If a bachelor's training ends with granting him or her only a degree, it will not result in the above contradiction. In fact, a bachelor's degree will confirm the level of academic training, enabling the graduate to choose ways and forms of his or her further activity. It will be up to him or her whether to go on with his or her education, taking the subsequent stages, or to assume it completed and switch to any practical activity, i.e., entrepreneurship. However, professional pedagogical activity will be open, providing that the stages following the bachelor's degree are successfully mastered. So a bachelor with a degree and fundamental academic education, in terms of the profession, is a bit "semi-finished," fit for further multitudinous "additional training" (including taken on his or her own), thus sufficiently widening his or her possible realization as a pedagogue.

Analyses carried out in respect of "a degree-holder specialist" and "a bachelor" with a preferential role of the former in higher pedagogical education can be applied to notions of "a degree holder-specialist" and "a master." A master's stage can be attained by two means: either by graduating from a bachelor's educational program or receiving a specialist's degree. A master graduate is educated to work as a teacher of a specific discipline at school, to carry out research work in the field of education, to teach at higher school within the chosen direction, etc.

In context of the present article, the key factor is the possibility for a master to conduct his or her professional activity at school. So, irrespective of any type of educational program, professionally a master should not be educated in any diminished degree from that of a respective degree-holder specialist. Nothing less than practice can provide an answer to the path of higher pedagogical education in Russia. The given considerations only justify training a degree-holder specialist as top priority in university education for a future technology teacher. Moreover, the given choice in no way limits any democratic chances to develop higher pedagogical education in the field. Naturally, a specialist level of training set up by general school requirements determines the limits used to educate a bachelor and a master of technological education; the difference is that the "upper" boarder is applied for a bachelor and the "lower" one for a master.

While developing the standard, we have faced another equally significant problem, that is, how to maintain a real level of university academic freedom when working out respective educational programs to train a teacher of technology and entrepreneurship. Currently Russia's legislation grants universities freedom to work out their own educational programs, curricula, etc. On the other side of the spectrum, the unified federal area, tendency towards simplicity

of certifying procedures, need for opportunities to change universities, etc., have resulted in availability and a recent increase in unification tendencies at higher pedagogical school management.

Formal data implementation, being a quite positive factor as a whole, specifies the hazard of shifting back to the traditional, strictly regulated pattern of educating a specialist-teacher; it questions the availability of the university (academic) freedom. In this context, the standard, due to its regulatory essence, might be considered as a perfect executive instrument. It seems worth pointing out that the preceding standards bore an air of strict unification concerning humanitarian, vocational, and pedagogical disciplines, with the universities free only to stipulate their curricula sequence with evidently low variability due to the natural logic of their subject. In developing the first generation standards, it was assumed that a thesaurus approach would constitute a democratic basis for implementation. Unfortunately, for various reasons too lengthy to discuss in this article, no significant results were obtained in the course.

Presumably, because the standardization of Russia's higher pedagogical school has not been developed enough and there are a number of mutually contradicting approaches, the problem cannot yet be unambiguously resolved. So, the authors are forced to apply largely imperative approaches. It essentially complicates the situation, because the nonavailability of the objective basis for a standard's development enables the authors to impose their subjective views. It becomes possible to introduce in the standard certain units, that match their personal preference, so disciplines might be adopted without wide appraisal. Not only is this problem quite familiar for Russia's higher pedagogical school, but it can be classified as common for enacting federal regulations. One can find a lot of examples to the effect in the former practice of working out and adopting the state standard curricula, as well as new generation standards. Presently the situation is worsened by a much too-detailed obligatory minimum act of standards used to educate a specialist, as well as by the simplified order to adopt the standards.

Traditionally, one solution to the given problem has been to facilitate a certain time budget. This provides for studying the disciplines of the regional component and the disciplines chosen by a university; as a whole it equals to 20% of a student's total general education. In our opinion, the given measure, though necessary for vocational education variability, fails to overcome the influence of the negative factors under discussion. At best we can only claim a reduction in their impact.

We believe that the necessary thing to maximally democratize specialist-teacher's training at the university is the discipline's maximum integrity, stipulated by the standard obligatory minimum and by the model federal curricula. On the one hand, it ensures a common federal approach towards curricula; on the other hand, universities are granted the opportunity to develop their own structure of the respective educational courses.

The offered approach has been used to develop the structural pattern to train teachers of technology and entrepreneurship in respect to their subject. In general, the principal structure used in the former standard has been preserved, stipulating a student's training on cycles of general technical, technological, entrepreneurship, creative, design, and other disciplines. This approach corresponds to Russia's experience in educating teachers of technology and is continuously justified by pedagogical practice. Ambiguity of specific subject training for teachers of technology and entrepreneurship is largely determined by introducing federally mandated courses, namely, Applied Mechanics, Engineering Science, Info-Technology, Electro-Radio Engineering, Graphics, Fundamental Entrepreneurship, Fundamental Designing Disciplines, and Technological Practical Training. Amounting to 59% of a subject's training to become a teacher, the disciplines predetermine uniformity of the respective curricula. Simultaneously, they do not violate academic freedom of teaching because their interactivity ensures a wide range of their individual fulfillment within a certain university.

Finally, the last, but not the least essential, issue reflected in the standard is the necessity

of considering the peculiarities of Russian technological education. We mean separate training in engineering, housekeeping, farm-industry production, etc. Each direction can be pursued in variants depending on regional conditions and requirements, state of the teaching and material resources of educational institutions, wishes of the school children and their parents, etc. The mentioned multi-discipline (and multi-aspect) essence of technological training is complicated, over and over again, by the need to follow the federal requirement of uniformity towards acquiring minimum general technological knowledge and skills by the school children.

These peculiarities of technology have been envisaged in the standard by structural organization of the Subject's Training Disciplines unit, where the so-called "Disciplines of Specialization" are introduced. The required invariant constituent concerning the professional aptitude of the future teacher of technology and entrepreneurship is ensured by the above federal integrative disciplines, being basic to further education. The Disciplines of Specialization, multi-variant by their essence, lay down the guidelines for the in-depth professional specialization of a teacher to be, that is, a person capable of fulfilling this or that variant of technology.

As compared to the first generation standard, the new standard somewhat increases the time allocated for disciplines of specialization up to 900 hours (amounting to 21% of the subject's training time, though even this may seem insufficient). Should it happen, we think it is worthwhile to refer to the standard in part, allowing for the use of time stipulated for the regional component as well as the so-called chosen disciplines (amounting to 20% of the subject's training) required to enlarge specialization disciplines.

By developing the new standard the authors didn't manage to realize all the ideas stated in some of their latest articles and submissions in Russian professional press (Karatchev & Kaplin, 2000; Karatchev & Lavrov, 2000; Karatchev & Yakobson, 2001; Lavrov, 1999, 2000). The main cause of it was the necessity of providing quite a high level of the uniformity of the standards for various pedagogical specialties. Notwithstanding this, we still hope that a new educational standard on the technology and entrepreneurship specialty shall make it possible to enhance training of specialists in Russia's pedagogical universities.

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