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### Dialogue of Cultures - Culture of Dialogue: from Conflicting to Understanding

### DEVELOPMENT OF VOCATIONAL TEACHER'S SCIENTIFIC POTENTIAL WITH REFERENCE TO FOREIGN EXPERIENCE

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#### *Abstract*

The article provides the analysis of statistical data on the system of vocational education and training in the Russian Federation, which has laid the foundation for the collective portraits of the vocational teacher and apprentice master elaborately assembled by the authors. Another valuable outcome of the analysis was the opportunity to detect one of grave problems of the VET system - high unemployment rate among the graduates - and its cause. In order to find an effective solution the authors have turned to the modern VET research done by acclaimed international organisations as well as the experience of the countries that either demonstrate the renowned high level of education - Finland, South Korea, France and Germany or can be compared with Russia in terms of size, administrative structure, economy type or GDP per capita: Argentina, China, and Turkey. The juxtapositional analysis of the VET systems has allowed identifying the omni-characteristics of VET. Relying on the analyses, the authors suggest multivector solution that is tightly linked to continuing professional development and the growth of vocational personnel's scientific potential. The solution has a methodical regard to modern global tendencies in VET that demand the preparedness to perform in a constantly changing environment and face new challenges for the vocational teacher and trainer.

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**Keywords:** Scientific potential, teacher, trainer, vocational education.



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## 1. Introduction

The analysis of the available statistical sources on vocational education and training (VET) in the Russian Federation suggests that the unemployment among the VET graduates is one of the gravest problems of the system. According to the data, one forth, 25.3% (Bondarenko et al., 2018, p. 61) of VET former students is out of job. This is true for both junior and specialist VET programmes. Among girls the percentage is even higher, 28.1%. While seeking and applying for a job, the major disadvantage voiced by over a half of the collegians, 52.6% (p. 70) is the absence of working experience. Only 15.4% of specialist programme trainees and 10.5 % of those of junior level have a position in accordance with the obtained qualification or connected to it.

## 2. Problem Statement

These data confirm that the efficiency and effectiveness of the VET system in Russia is lamentably low as well as one of the possibilities to enhance it is the development of the vocational teacher's scientific potential.

## 3. Research Questions

The successful solution of the problem requires a thorough understanding what the vocational teacher in the Russian VET is like. In the article the two main categories of the Russian vocational teacher are being examined: the vocational teacher and the trainer or as it is named in Russia the apprentice master. A Russian vocational teacher is a woman (approximately 82 % are women that is twice as much as the economy average) aged 43-45 that is 3-5 years older than the economy average and this index is growing steadily. Slightly more than 45 % of Russian vocational teachers are over 50 (p. 247). She has certainly got higher education (96%), which is not necessarily a pedagogical one (60%). In contrast to private colleges, where one fifth of vocational teachers have got PhD degree, at state institutions they are rather seldom to encounter (3%). She teaches classes or groups of 20 or so students. During the last three years she may have had some hours of professional development, yet more than half of the time (58%) was dedicated to the pedagogical component of the teacher's job. Only one tenth has been to the production site. Surprisingly, among those who teach at junior vocational schools, which train qualified workforce, this index is even lower (7.4%). Nearly the same number of vocational teachers (12.5%) has attended professional development classes where they have been trained how to use ICT in class. Every fifth VET teacher's position is vacant.

The trainer or apprentice master might be either a man or a woman. About a half of them are over 50. S/he has got either higher (48%) or vocational (41%) education. As for private colleges, four out of five masters have got higher education (84%), while one fifth of them are qualified teachers (17%).

At state colleges the master has got from 14 to 19 apprentices, while the total number of masters in the country is about 28.000 people (p. 229). Having compared these figures with the French ones, for example, we have found out that a French trainer is banned to have more than three apprentices at a time whereas the number of masters totals about a million. The same situation may be observed in Finland or Germany.

Two out of three Russian masters have had hours of professional development within recent three years. However, just one fifth of them have been to the production sites. Less than a tenth has been trained to use ICT in class (8%). Every fourth position is vacant.

There are some more data that appear relevant to our study:

- 0.02% of the GDP of the Russian Federation is spent on professional teacher development at all levels: primary, secondary, tertiary, post-secondary non-tertiary that equals about 60 Euros a year per capita (p. 83).

- just one out of eight Russian VET students (13%) has a possibility to use a computer with the Internet access where s/he studies. Frankly speaking, at the level of tertiary education this index is not much higher (21.5%).

The teacher is a key element of any educational system. Studying the history and experience of vocational education and training abroad may enrich the theory and practice of VET in Russia and indicate the approaches how to tackle the problem of professional development and realisation of the vocational teacher's scientific potential.

In the beginning, it is necessary to remark that the main objective of vocational education abroad is a training of a technical, tradesman or artisan. First and foremost, they are supposed to obtain practical knowledge and skills, certain experience and manual labour. In general, vocational schools admit secondary school leavers aged 15-16. However, during the recent decade more and more adults have decided to change the sphere of their work so they take courses at vocational schools, too. In many countries of the European Union adult learners constitute over a half of all vocational students and these figures are steadily growing (Eurostat Statistics Explained, 2020a).

Unlike recently when vocational education could be attained only at vocational schools, there are online and open vocational education portals where training is offered by both state and private educational institutions. The latest World Bank report points out that technologies are having more and more influence on the changing nature of work that results in another tendency in VET, which is the correlation and interchangeability of VET and higher secondary school programmes. According to the WB experts, it will enhance the social and academic mobility of the graduates of both systems at the swiftly changing labour market where technologies play an ever-increasing part ("International Bank for Reconstruction...", 2019, p. 25).

According to the recent survey, employers in developing countries including the Russian Federation tend to often prefer employees with sociobehavioural skills to those with technical ones. This confirms the necessity to coordinate the programmes.

#### **4. Purpose of the Study**

VET systems differ from country to country. In order to attain a broader and fuller picture and to make more precise conclusions we have focused on three sets of countries. First, they are Finland and South Korea, the neighbours of Russia with the renowned high level of education. Second, they are Argentina, China, and Turkey that can be compared with Russia in terms of size, administrative structure, economy type or GDP per capita. Third, they are France and Germany as the examples of the acclaimed VET systems

in developed countries. What is more, four of these countries - Germany, Finland, France and Turkey - are the signatories of the Bologna Accord, whereas the other three are not.

1. VET system in Finland, which has three levels of vocational education features very close links with the production and training being deliberately tailored for a particular manufacture or company. Owing to this, the students need neither time nor effort, nor probation period because VET takes place on the production site as well. Such method allows solving the problem of former trainees' employment (Education statistics Finland).

Other characteristics of the Finnish VET system are the high degree of the individualisation of training and careful consideration of students' needs that permit to keep the level of early school leavers lower than in Europe - 8.3% in comparison with 10.6% as European average (Eurostat Statistics Explained, 2020b). The like educational environment completely diversifies the vocational teacher's activities who thus serves as a connecting link between the production and the student as well as their assistant in solving any problems. This is why, the compulsory professional development tightly connected to the career growth is regarded as an onsite training ("Ministry of Education and Culture...", 2020; "Professional Teacher Education..." 2020).

2. In South Korea, where VET system also contains three levels, a well-thought and balanced organisation of certification, professional development, and inspection of the vocational teacher's activities may be noticed. Its first component is a compulsory state exam that all secondary teachers involving vocational ones have to sit. It is attached great importance for it permits to support the high level of teachers' initial training. The second component is the teacher's continuing professional development, which is encouraged and supported int.al. financially by the state and government. It also creates the clear trajectories for a teacher's career growth. These trajectories include consolidated assessment by peers, students and their parents, compulsory rotation of teachers every five years that allow maintaining the teacher's inner motivation to constant professional development ("National Academies of Sciences...", 2015; "National Centre on Education...", 2020a; 2020b; "United Nations Educational...", 2018).

3. Studying the vocational experience of Argentina leads to the conclusion that the system of education of a federal state with varying federative units is unable to function persistently unless it is hierarchical. One of the most meaningful components of such a system may appear a unified state examination at all levels of education entailing vocational education and training as well as vocational teachers' certification or licensing (Monroy, 2018).

4. VET system in Turkey that offers several trajectories of vocational training arouses profound interest since it manages to combine academic studies and vocational training, laying foundation for its continuation. Nevertheless, the avalanche evolution of technology used at the production is forcing the Turkish vocational teacher to professionally develop in this direction (Durgun, 2016, p. 19). One more initiative worth adopting is the introduction of an online platform where teachers can outline their professional interests and preferences so that regional or state authorities are able to form more accurate conception of required courses or events of professional development and fit them for the target audience and its particular needs. Other opportunities for professional development and innovations in Turkey encompass the participation of vocational teachers in home and international projects, learning English in

Great Britain and the establishment of the corps of independent educational auditors (Turkish Ministry of National Education, 2018).

5. In France, there are flexible and interchangeable trajectories between high general, technological or vocational levels of education, i.e. there is a possibility to switch the level of education during the first two (out of three) years of learning or training. Having graduated from a vocational school, any former student is capable of proceeding his/her education at tertiary level. Such a phenomenon as *lycee des métiers* is certainly worth paying the closest attention to for it is an unusual educational institution that offers multi-level training and diplomas up to a vocational bachelor degree built around a coherent group of trades (Ministere Education Nationale..., 2010, p. 10). This variety of educational paths creates more possibilities for the students' academic and professional mobility, owing to which youngsters are unobliged to make a somewhat fateful choice at the age of 16. Still another decisive aspect of the French VET system is that its planning is accomplished by a consolidated body based on integration of manufacturers and social services among other participants. The enumerated aspects explain the fact that French vocational teachers, trainers and apprentice masters are first and foremost specialists in an industrial field or employees of collaborative companies and manufactures. Thus, their professional development is the development at the production site ("European Centre for the Development...", 2008).

6. VET system in Germany is one of the most acclaimed and prevailing in the world. There are several reasons for such a situation. To begin with, the system serves the needs of small and medium-sized businesses; then, it takes into consideration production perspectives of a region as well as VET graduates' employment. These features condition the approaches to higher pedagogical education in Germany, which majors are those vocational subjects that are going to be taught at vocational schools. So is the vocational teacher professional development, which is not only about pedagogy, but also about getting vocationally and technologically upgraded. Moreover, horizontal professional mobility, i.e. learning how to teach other vocational subjects is acknowledged, too. The necessity to undergo regular courses of continuing professional development is compulsory in Germany ("Federal Ministry of Education...", 2020; Hippach-Schneider et al., 2007).

7. Within 20 recent years of intensive economic growth, VET in the People's Republic of China, which is divided into secondary and higher levels, has gone through several dramatic transformations. In February, 2019 the State Council of PRC announced the latest reform, which is a persuasive confirmation to the statement that VET is not only the basis, but also a locomotive of the economic success and prosperity. The main objectives of the reform are closer integration of vocational schools and enterprises and the diversification of higher vocational institutions by means of extension of the range of their occupational skills certificates (The State Council of the People's Republic of China, 2019). There is a set of initiatives relating to the vocational teacher, one of which is the requirement to work experience of at least three years at an enterprise. The existing requirements are also quite tough and demand regular exam sitting (once in five years) along with strict conditions to access it (GetChina Insights, 2019); they also demonstrate accurate correlation between the continuing professional development and scientific growth of vocational teachers and their class ranks ("Ministry of Education of the People's Republic ...", 2018; The World Bank, 2018).

## 5. Research Methods

The stated problem, research questions and the purpose of the study have determined the following research methods: the study of the latest available reports, articles and data on VET, vocational teacher and apprentice master training as well as their professional development with further statistical and juxtapositional analyses of the data found.

## 6. Findings

Having examined over 20 sources on VET systems and continuing professional development of vocational teachers, trainers and apprentice masters in Finland, South Korea, Argentina, Turkey, France, Germany, and China, we were able to detect their common or omni-features:

1. Direct correlation between vocational education and production: on-site training and training tailored for a concrete production. In order to achieve this

- the vocational teacher in all the countries has to have at least three year work experience. In Finland, Germany, Turkey, China his or her education should be first of all industry-specific whereas its pedagogical component is regarded as supplementary, acquirable. So should professional development be connected with the changing nature of production and technologies along with socioeconomic conditions, i.e. teaching migrants, adults and physically disadvantaged people.

- trainers and apprentice masters are employees of an enterprise whose function is an on-site training. They have no pedagogical education. In Finland, Germany, China employers take part in educational process, i.e. education at vocational schools is tightly integrated with manufacture and custom-built to it.

2. Wide use of ICT feasibilities. In order to achieve this

- various Internet portals have been created for vocational teachers in South Korea and Turkey; for trainers and apprentice masters in Finland; a great number of CPD courses are held online (in South Korea and PRC); virtual platforms for informal vocational teacher communities have been worked out (South Korea).

3. Layered structure of VET systems, i.e.

- VET systems are divided into several levels. In general, they are post-secondary and higher vocational education levels, which exist, on the one hand, parallelly, yet, on the other hand, in interrelation with post-secondary general and higher education as equal trajectories to attain quality education and demonstrate the tendency to mutual integration.

- CPD is also divided into two levels: the formal one, organised by the state, and the informal one, supported by the state, but fulfilled by vocational personnel themselves.

4. State examination and certification are the compulsory requirements for the vocational teacher to perform. They involve:

- a unified state qualifying examination (South Korea, China, Finland, France, Germany);  
- the obligatory standardisation and certification of vocational teacher's qualifications (Argentina, China);  
- the introduction of educational audit (Turkey);

- the transparent dependence of career growth on regular and successful CPD (Finland, Germany, South Korea, China).

## 7. Conclusion

From the perspective of the findings and the Russian VET system indices, it is astute to state that:

1. The primary concern that the national system must deal with is to enrich the learning process at VET with the relevant practical experience that the graduates will be capable of exploiting as a competitive advantage while seeking for employment.

2. In order to achieve it, it is necessary to lay proper basis for the VET integration with production on the ‘schools in factories’ basis. Particularly, the vocational teacher and trainer's CPD must be directly linked to a concrete production, which they are preparing the workforce for. The components of such onsite training should be thorough acquaintance with the tasks and challenges this production handle and meet; the speciality of goods or services it produces or provides; the technologies that are being utilised; competences and skills they expect their employees to possess etc.

3. Another vector of the vocational teacher's professional development should become a new direction - strategies of teaching professional subjects and modules that ought to be united into an interdisciplinary course, scientific potential of which is yet to be studied, requires conception, and directly linked to the vocational teacher's scientific potential based on his or her onsite training.

4. The third direction of the professional development should be the extensive use of ICT in the vocational teacher's routine with focus on the technologies used in production processes at a concrete enterprise. In order to achieve it, there should be firstly, enough computers with the Internet access and simulation programs and secondly, specialists who are the employees of the enterprise. It is certainly sensible to transfer such training to the production site. On the one hand, it will permit to combine all the three vectors of professional development together (production environment, strategies of teaching professional disciplines and production technologies) and, on the other hand, it will significantly enhance the vocational teacher's scientific and professional components of his/her qualification.

5. Modern global tendencies in VET - teaching adults, possibilities to attain VET online and via open education, correlation and coordination of general and vocational educational programmes - demand the preparedness to perform in constantly changing socioeconomic, technological and ecological environment and face new challenges for the vocational teacher and trainer. Therefore, it appears reasonable to create such conditions that facilitate the formation of new and the evolution of the already possessed professional competences of the vocational teacher and trainer, contributing to the most complete actualisation of their scientific potential and aimed at:

- learning andragogy so as to possess the necessary skills to teach adults;
- forming promptness to perform in and under varying conditions: in class at vocational school, at the production site, teaching online and offline;
- encouraging and fostering non-linear trajectories of professional training and CPD, creating feasibilities for skills accumulation and their further certification;

- creating the conditions to develop advanced cognitive skills such as critical thinking, collaboration, communication, creativity and further self-study, ability to work independently and autonomously, in multitasking and constantly varying environment etc during the training.

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## References

- Bondarenko, N., Gokhberg, L., Zabaturina, I., Kovaleva, N., Kuznetsova, V., Ozerova, O., Pinskaya, M., Podolsky, O., Ponomareva, A., Rylko, E., & Schugal, N. (2018). Indicators of Education in the Russian Federation: 2018. Moscow: National Research University Higher School of Economics.
- Durgun, A. B. (2016, March). Continuing professional development for vocational teachers and trainers in Turkey. European Training Foundation.
- Education statistics Finland. Vocational Education and training. (2020, March 24). <https://vipunen.fi/en-gb/vocational-education-and-training>
- European Centre for the Development of Vocational Training. (2008). Vocational Education and Training in France. Luxembourg: Office for Official Publications of the European Communities. [https://www.cedefop.europa.eu/files/5190\\_en.pdf](https://www.cedefop.europa.eu/files/5190_en.pdf)
- Eurostat Statistics Explained. (2020a, March 24). Adult learning statistics - characteristics of education and training. [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Adult\\_learning\\_statistics\\_-\\_characteristics\\_of\\_education\\_and\\_training](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Adult_learning_statistics_-_characteristics_of_education_and_training)
- Eurostat Statistics Explained. (2020, March 24). Early school leavers. [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:2018data\\_Early\\_school\\_leavers-02.jpg](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:2018data_Early_school_leavers-02.jpg)
- Federal Ministry of Education and Research. (2020, March 24). The German Vocational Training system. <https://www.bmbf.de/en/the-german-vocational-training-system-2129.html>
- Hippach-Schneider, U., Krause, M., & Woll, C. (2007). Vocational education and training in Germany: short description (Vol. 138). Office for Official Publications of the European Communities. [https://www.cedefop.europa.eu/files/5173\\_en.pdf](https://www.cedefop.europa.eu/files/5173_en.pdf)
- International Bank for Reconstruction and Development. (2019). The Changing Nature of Work. World Development Report. Washington, the USA. <http://documents.worldbank.org/curated/en/816281518818814423/pdf/2019-WDR-Report.pdf>
- GetChina Insights. (2019, October 1). China's vocational education industry ushering in a golden era. Medium. <https://medium.com/@EdtechChina/chinas-vocational-education-industry-ushering-in-a-golden-era-a20dab84d137>
- Ministere Education Nationale. (2010). National Education and Vocational Education in France. [https://cache.media.eduscol.education.fr/file/dossiers/61/8/formation\\_professionnelle\\_VA\\_151618.pdf](https://cache.media.eduscol.education.fr/file/dossiers/61/8/formation_professionnelle_VA_151618.pdf)
- Ministry of Education and Culture. (2020). Vocational Education and Training in Finland. <https://minedu.fi/en/vocational-education-and-training>
- Ministry of Education of the People's Republic of China. (2018). Statistical report on China's vocational education in 2018. [http://en.moe.gov.cn/documents/reports/201906/t20190605\\_384566.html](http://en.moe.gov.cn/documents/reports/201906/t20190605_384566.html)
- Monroy, C. (2018, May 8). Education in Argentina. *World Education News and Reviews*. <https://wenr.wes.org/2018/05/education-in-argentina>

- National Academies of Sciences, Engineering, and Medicine. (2020, March 24). Mathematics Curriculum, Teacher Professionalism, and Supporting Policies in Korea and the United States: Summary of a Workshop. Washington, DC: The National Academies Press. <https://doi.org/10.17226/21753>
- National Centre on Education and the Economy. (2020a, March 24). Centre on International Education Benchmarking. South Korea: Career and Technical Education. <http://ncee.org/what-we-do/center-on-international-education-benchmarking/top-performing-countries/south-korea-overview/south-korea-school-to-work-transition/>
- National Centre on Education and the Economy. (2020b, March 24). Centre on International Education Benchmarking. South Korea: Teacher and Principle Quality. <http://ncee.org/what-we-do/center-on-international-education-benchmarking/top-performing-countries/south-korea-overview/south-korea-teacher-and-principal-quality/>
- The State Council of the People's Republic of China. (2019, February 13). State Council encourages vocational education reform. [http://english.www.gov.cn/policies/latest\\_releases/2019/02/13/content\\_281476520067560.htm](http://english.www.gov.cn/policies/latest_releases/2019/02/13/content_281476520067560.htm)
- Professional Teacher Education in Finland. (2020, March 24). *Studyinfo.fi*. <https://studyinfo.fi/wp2/en/higher-education/polytechnics-universities-of-applied-sciences/vocational-teacher-education-in-english/>
- Turkish Ministry of National Education. (2018, November). Outlook of Vocational and Technical Education. Series of Education Analysis and Assessment Reports.
- United Nations Educational, Scientific and Cultural Organization. (2018). TVET Country profile: Republic of Korea. [https://unevoc.unesco.org/wtdb/worldtvetdatabase\\_kor\\_en.pdf](https://unevoc.unesco.org/wtdb/worldtvetdatabase_kor_en.pdf)
- The World Bank. (2018, October 30). Technical and Vocational Education and Training: Lessons from China. <https://www.worldbank.org/en/news/feature/2018/10/30/technical-and-vocational-education-and-training-lessons-from-china>