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Research Paper

Trends in and principles of training vocational teachers

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Abstract

The urgency of the problem under consideration here has been necessitated by a need for training more vocational teachers for the system; they are to be specialists in developing and implementing the basic and optional educational programs designed for workshop force and mid-tier specialists; this means preparing the personnel resource for innovation industry. The goal of the paper is to reveal the changes that are necessary to be brought about for improving the quality of training delivered to students of vocational pedagogy and continuing vocational education. The key approach to the study of the problem is the systems activity approach that allows us to employ the systems concepts for building domain-specific schema linked to the investigation of how vocational teacher training is organized today, with regard to the requirements set by Russia's educational standard "Teacher of vocational training and continuing vocational education". Analysis of theory and findings in the literature led us to the conclusion that, considering the particular properties and logic of vocational teacher's education, as well as reliance on the approaches and concepts under consideration, is what shall cater to the ever increasing demands to it from man, society and state. In view of the analysis' results, we suggest recommendations for improving vocational teacher training that would lead to vocational education/training/continuing education quality enhancement, including training offered in corporate training centers and innovation industries. The materials herein may be of value to educational managers in forming their personnel resource.

Keywords: *Vocational Teacher; Occupational Trainer; Vocational Educator; Educational Standard; Professional Standard.*

1. Introduction

Vocational teacher education in Russia, since its first traces till its emergence as an independent educational industry, has gone a long and cratered path. Its theory, in various aspects of vocational teacher training, was touched upon by Russian scientists [1-6] and their colleagues in other countries worldwide [6]. Also is available the extensive practical knowledge accumulated by the Vocational Training Methodological Association of the Russian Federation (comprising in itself secondary and tertiary education institutions), in-between 1988 and 2015 (VTMA).

Vocational pedagogy is the only type of education in Russia that was devised for and directed specifically at occupational training (earlier called 'basic vocational education') and secondary vocational education. In connection with this, vocational pedagogy is very specific in its goals, contents and methodology. It tries to orient its graduates not to a specific subject area or course but at the contents of vocational training in a group of related blue-collar and white-collar occupations.

What a graduate from a vocational pedagogy institution knows and is skilled in are the competencies and knowledge that will help teach other people in the blue/white-collar occupation he/she is master of him/herself. He/she knows its complexities and problems, its underlying theory; he/she is practiced in forming professional competencies and skills in other people, with regard to the logic and principles of vocational pedagogy/psychology, and to state-of-the-art teaching aids and equipment or else the IT involved [7].

The generalized occupational roles such a graduate may perform belong to those of a vocational/occupational teacher/trainer (foreman in occupational training, educator and/or methodologist in vocational training, vocational education and continuing professional education).

In this respect, what becomes important and much needed is to relate the currently common approaches to teaching vocational educators and the requirements set by the State Standards in Education (SSE), the Federal State Educational Standards in the major area "Vocational training (by the sector)", and the professional standard "Teacher of vocational education/training and continuing vocational education". This said, in this paper we endeavour to work out the structure and contents of what constitutes the education of a vocational teacher, with regard to personal characteristics and modern requirements of state and society.

2. Materials methodological framework

2.1. Methodological background

The main methodological framework for our study was the 'systems/activity approach' that we relied upon in order to reveal inconsistencies between the existing system of vocational teacher training and the modern social and economic development factors now at work in Russia's regions; this framework unites in itself two scientific approaches: the systems approach, works on which we can find in the publications of outstanding Russian scientists [8], and the activity approach [9] that allows us to reveal the inconsistencies and suggest recommendations on their elimination, on the basis of comparing employer demands, educational standards at colleges and universities and professional standards, with

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the real organizational and educational environment at vocational pedagogy tertiary schools.
The study methodology was further enhanced and enriched: 1) by the theory and practical experience related to vocational teacher education [10-14] that allow us to also identify the approaches and principles conductive to a better quality of such education: meta-activity approach to capacity building in graduates; the principle of double advance of the vocational teacher training over the occupational skill structure of vocational education personnel in a region, and over the requirements to blue/white-collar workforce training and skills; the principle of progressive professional development of graduates from vocational pedagogy institutions; the principle of making out students' personal plans of professional development within a college/university.

2.2. Methods of Study

For our study goals, we used a set of study methods as follows: theoretical: analysis of methodology, psychology and educational literature; analysis of courseware documentation and statutory instruments in the domain of occupational training and vocational teacher education; systems analysis; generalization and evaluation; 2) empirical: analysis and generalization of the on-hand teaching experience.

3. Results

3.1. Differences between vocational teacher education, teacher education and sector education

In some works [15-17] are considered the key forms of how vocational teacher education has been developing over time. With focus on formal differences in training systems, these authors substantiate their inferences by quantitative indicators, such as:
vocational teacher education is aimed at shaping a student's personality capable of effectively realizing him/herself in the domain of occupational training and secondary vocational education (SVE), the one able to perform all educator's function in the work of training blue- and white collars, and to engage in corporate training. General teacher education is oriented towards providing skilled professionals for pre-school and general education institutions.
in vocational pedagogy most common are such activities as project-based training arrangements with regard to: employers' requirements, trends and perspectives of regional development, or else implementation of original educational programs; at the same time in general pedagogy we find more or less fixed curricula and methodology.
vocational teacher education is aimed at training its students to teach a set of blue/white-collar occupations, or else a range of occupational skill levels; again, general pedagogy has in view only a limited number of general education disciplines.
vocational pedagogy implies a deep integration of psychological/pedagogical and sectoral subject areas, while general pedagogy demonstrates its interest in subject disciplines, concrete methods and educational practice.
at the heart of the methodology taught to vocational educators lie the skills of planning and implementing original methods for blue/white collar training at a range of occupations, along with mastering the 'universal' blue/white collar occupation; on the other hand subject teachers of general education are provided with methods of teaching 1 - 2 general education areas;
If compared to sectoral specialists (e.g., civil engineers, agronomists, etc.), vocational educators must both be master craftsmen themselves and be able to teach the craft to their students.
It is widely believed that vocational pedagogy and general pedagogy are different in principle, which is based on qualitative indicators:
A teacher is directed towards mastering theory, while a vocational educator is focused on practice. Due to this, learning the pedagogical profession is based on theoretical/methodological approach, while in vocational pedagogy, students are taught the activity approach as the first priority.
at the heart of general pedagogy lies the learning of someone else's experience and then further teaching it to students; in vocational pedagogy, conversely, this experience is first 'refracted through the lens' of personality and professional competencies of the educator and only afterwards delivered to students.
With regard to the above, the general subject teacher and vocational educator are two qualitatively distinct professions relying on the same learning pattern but on prinicipally different contents.
In addition to the specialized system of education in vocational pedagogy, there are more eclectic schemes of training educators for vocational and secondary vocational schools. All of them retain the character of a simple summation: it is either tertiary sectoral education (engineering/technical, economics, etc.) with supplemental psychological and pedagogical modules, or it is general pedagogy with additions of sectoral subjects and disciplines. Any of the combinations is incapable of integrating psychology and pedagogy with sectoral technical training, or of optimally creating a natural combination of a vocational educator and master craftsman in one person; on the other hand we ought not to discard these forms of training altogether.

3.2. Conceptual framework underlying the training of a vocational educator

In some works [18-20] are considered the key conceptual models of a vocational educator that were at the heart of developing and shaping the curriculum for vocational pedagogy training (Table 1) These notions and ideas are of great value in terms of achieving the task indentified in this paper
As things stand, some authors in their papers consider the step-by-step evolution of vocational pedagogy (Table 2), in particular, Tenchurina (1998) reviews and summarises the history of vocational educator training from 1920 to as late as 1991.
How vocational pedagogy evolved, its efficiency and results were to a large extent determined by social, political and economic processes having place in the society. The emergence of job market was what made the professional qualifications and skills and occupational mobility (in the chosen sphere) of employees a prerequisite for desirable standard of living. In its turn, this sets new tasks and challenges to voca-tional pedagogy: to establish occupational mobility of graduates by enriching their general cultural and professional competencies; to attract best sectoral specialists who, on the one, are capable of becoming teachers, on the other, for some reason decided to change their occupation; and to provide further training/retraining to unemployed population.

Table 1: Conceptual Modes: the Vocational Teacher

Model name	Characteristics
'Engineering educator' specialist	Engineer-educator, a 'mono-specialist' having two equally important sets of skills for vocational pedagogy – the engineering and the pedagogical ones.
Integrative vocational pedagogical activity	Alongside more traditional types of teaching activity, the engineering and manufacturing one is the key factor of expanding the activity area of a future vocational teacher. Implementation of this idea helped graduates work both as a teacher of theory and supervisors.
Competent specialist	A competence-based model relying on expert evaluation methods; definition of general cultural and professional competencies; BA and MA curricula with related competencies and skills.
Modern vocational teacher education	Science-based choice of the contents and curricula for vocational teachers, in compliance with educational and professional standards; project-based methods of developing vocational teacher competencies; study progress control instruments.

Table 2: The Making of Vocational Teacher Education in Russia

№	Period	Characteristics	Vocational teacher training
I.	1860-1920	Occupational training at the place of work	Further training and re-training (one/two years) of specialists already having a university degree. Specialized educational institutions with sectoral and psychological/pedagogical training. Inadequate pedagogical curricula (by expert opinion). Over 300 specialists graduated. Further development of the system stopped due to the WWI events of 1914.
II.	1920-1930	Specialized pedagogical training for teachers and master craftsmen, at tertiary and secondary education institutions	Founding of tertiary engineering and pedagogical institutions, pedagogical schools at universities, re-training courses for teachers and engineers. Founding of the Industrial-Pedagogical college and of the Agricultural Teaching Institute (1922) – the 'forefather' of modern pedagogical training in Russia. Course duration at universities (3 years in engineering and 2.5 years in agriculture) was not enough for quality specialized/pedagogical training to be provided to graduates. The standard and level of education were inadequate for the needs of the quickly developing system of occupational training. Thence a lack of highly qualified research and teaching personnel along with insufficient scientific support to vocational teacher education.
III.	1930-1943	The system of government-funded vocational teacher education is crumbling	All tertiary vocational teacher training institutions closed (1937). The focus shifted to short-term courses (up to 6 months). A widely-held view that anyone can be a teacher to anyone else without special training. By 1945, 16 industrial-pedagogical colleges in 22 specialties founded.
IV.	1943-1958	Specialized pedagogical training for foremen and teachers of special and general engineering subjects	Teachers' departments opening at sectoral research institutes. Setting up continuing/further education and training courses for vocational teachers education personnel. The system of vocational teacher education system institutions partly reinstated. Vocational teachers are badly needed. In the vocational education system, 82% of foremen and 50% of master craftsmen had no secondary vocational education diploma; only 3.5-6.9% of foremen and 17.9-20.8% of head foremen had higher education degrees. Opening new departments in pedagogical and sectoral institutions (at 123 institutes/colleges by 1962). Setting up sectoral/pedagogical and general engineering departments at teachers institutes.
V.	1958-1992	Providing an organizational and pedagogical framework for training graduate vocational teachers	Founding of the National Institute of Further Education for Engineers and Vocational Teachers, with branches in other places. Founding of Sverdlovsk Engineering Pedagogical Institute (1979). Launching the Educational and Methodological Association of Tertiary Institutions in engineering and pedagogy, at the premises of Sverdlovsk Engineering Pedagogical Institute (1987). The rate of basic vocational education development (new secondary vocational schools providing both general and vocational education; developments in equipment and process technologies, new or revised blue-collar job duties) was much ahead of the growth of the vocational pedagogy system.

Table 2: (End)

№	Period	Characteristics	Vocational teacher training
V.	1958-1992	Development of organizational & pedagogical framework for vocational teacher tertiary education	The growth of the vocational teacher education system was set in motion by changes in the theory and practice of primary vocational education, due to education system reforms and implementation of the program "On strengthening links between life and school, and on further development of the system of popular education in the USSR". Vocational teacher education lacked scientific footing; because of this the training was formatted as 'engineer& teacher', or pedagogical modules were delivered in parallel with the engineering ones without any attempt being made at integration. Engineering & Pedagogical schools in sectoral tertiary education institutions had insufficient pedagogical potential, while teacher institutes were lacking resources for ensuring high quality engineering training; both couldn't provide good training in blue-collar occupations.
VI.	1992-2012	Transformation of engineering pedagogical education into vocational teacher education	Implementation of government decisions as to further development of the vocational teacher training. Organisationally and pedagogically, vocational teacher education was powerfully pushed forward by the founding of the Urals State Vocational Pedagogy University and, on its premises, of the Vocational Training Methodological Association of the Russian Federation. A new academic subject introduced: 13.00.08 – 'Theory and methodology of vocational education'. With a view to activate research on vocational education problems, in the Urals State Vocational Pedagogy University were set up: post-graduate courses, doctoral programs and the dissertation board on pedagogical subjects. For vocational teachers already having higher education, a new academic speciality introduced 'Voca-

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			tional Education', since 2000 – 'Vocational training (by the sector)'. In the experimental mode, the 'BA – Specialist – MA' system was introduced. G1 state educational standards (adopted in 1996) were supplemented by new academic majors: agricultural educator, fashion design educator, design educator, etc. Had been in active use till 2000. For persons with tertiary vocational teacher education, a wider qualification of 'vocational educator' was introduced, which distinctly defined the job of such specialists and was integrative and holistic. Primary (basic) vocational education/training was delegated down to the regional level. The Federal Law "On education in the Russian Federation", December 29 2012, No. 273-FZ, passed. Federal State Educational Standards for secondary and tertiary vocational teacher education approved for use in the sequence 'BA – MA – Post-graduate'.
VII	2012 – till today	Competence-based multi-level education of BAs and MAs in vocational pedagogy	The primary vocational training system eliminated and transformed into the basic level of secondary vocational training. In its turn, the latter's management delegated to regional authorities; in the secondary vocational training system, occupational blue-collar training (by the occupation) is introduced. The occupational standard 'Teacher of vocational education/training and continuing vocational education' established and approved. Due to this, more urgent became the problem of matching the qualification of existing vocational educators and vocational teacher students to the requirements of the standard.

The fast development of IT has also contributed to the change of the system. new occupations emerged (PC operator, DB developer, IT servicing and maintenance staff, knowledge engineers, etc); computerization brought about change to and expanded professional roles in common occupations; automation of processes ensured by IT has led a number of historical occupations and trades to sink in oblivion.

Thus, the development of industries and services was what determined the need for more vocational educators to train small business' personnel, including non-engineering/technical staff and highly qualified craftsmen in all sectors.

Organization, management and pedagogical conditions of training vocational educators are closely considered and discussed in the literature. The key ideas and notions pertaining to the structure and curriculum for "Vocational. Further development of the system seems to be dependent on: 1) more reliance in the basic and further vocational pedagogy upon state-of-the-art findings of the science and new developments in practice; 2) setting up, at educational institutions, of expert bodies including the key faculty members, who have experience in talking to employers, choosing curricula for vocational educators/further training teachers, and in using modern educational technologies.

3.3. Recommendations for improving vocational teacher training

Vocational pedagogy, on its institutional level and in curricula, reflects the life and change in society. Therefore, if under current conditions we are to further identify and define areas for improvement in its organizational and pedagogical framework (integrated training within a group of subject areas, profilisation in sectoral subject areas, further psychological and pedagogical training) it would seem reasonable to take into account its specific features, regularities and developmental peculiarities/inconsistencies.

The meta-activity approach to forming professional pedagogical skills and competencies among graduates is what will arguably teach them to constantly strive to learn more, retrieve and process new information; this will also help them master not only a single sectoral subject area but a group of such, which in the perspective of their subsequent teaching work will assist young vocational educators to plan and develop new curricula for new occupational teaching subjects, in line with the fast changing social and economic realities.

Due regard to the principle of the double lead of vocational pedagogy over the occupational skill structure of vocational education personnel in a region, and over the requirements set to the training for blue/white-collar workforce, will allow a beginner occupational educator to quickly adjust him/herself to the innovative teaching environment of a modern vocational school/college.

The principle of progressive professional development of graduates coming out of vocational pedagogy institutions allows to ensure, on the basis of specifying certain occupation types for various levels of tertiary education, a flexible and mobile structure of training, subject to regional labour market conditions. This appears to be possible because of better specified training goals and tasks at each level, i.e. due to working out and planning/organising relatively independent modules of training leading up to an appropriate diploma or degree.

The principle of relying on individual training plans in vocational pedagogy is what will secure a strong inter-relation between training and activity. The openness of the training process helps students of vocational pedagogy plan their path in studies in accordance with their individual wishes and personal traits, including the quality and level of one's original training Modern educational technology, including among other things intellectual technology, helps adjust the teaching process to personal traits of a student. A student of vocational pedagogy is provided with an opportunity to vary the length and manner of studying individual curricula. The flexibility of training programs within the major area "Vocational training (by the sector)" is secured by its modular character.

It would seem that due regard to the approaches and principles considered above shall bring about a change conductive to a better quality of vocational pedagogy training.

4. Discussions

Over the almost a century-long history of vocational teachers education, the practical experience accumulated so far is great. Yet, the training models on offer do not seem to be capable of solving the problem of this paper, due to the inconsistency of the existing vocational pedagogy system in this country with the modern social economic and pedagogic requirements put to it.

There are statutes and other legal framework necessary for improving the system of vocational teacher training; most weighty of which are:

Executive order of the Russian Government, of March 3rd 2015, No. 349-r "On approving a set of measures, target indicators and appropriate parameters aimed at improving the system of secondary vocational education, for years 2015 - 2020". This order determines that it is necessary to update and test the models of vocational teacher training for secondary vocational education in tertiary education institutions. Which, quite naturally, requires that the existing models be revised and new ones developed and proposed.

Executive Order of the Russian Government, of April 15 2014, No. 295 "Education development: a governmental program of the Russian Federation for years 2013 - 2020". This instrument points out that what is needed is a more attractive social and economic status of the teaching profession, and a higher qualification of teaching personnel. This, in turn, requires new mechanisms of incentive for educators to improve their quality and strive for continuing professional development.

Executive Order of the Ministry of Labour and Social Protection of the Russian Federation, of September 8th 2015, No. 608n "On approving the professional standard "Teacher of vocational education, occupational training and continuing vocational education". The document regulates the requirements put to education, training, and job experience of teaching personnel. Which allows to

specify differences in BAs/MAs' curricula, with regard to their perspective roles in education.
All in all, analysis of theory and empirical findings allowed us to come to a conclusion that a change to the structure and contents of vocational teacher training has be introduced with regard to specialization of a student's professional activity types done at the level of BA, MA and post-graduate studies.

5. Conclusion

Structurally and contensively, the existing system of vocational teacher training (specialty course teachers, foremen of occupational training, supervisors and teaching methodology experts) meets, by and large, the modern requirements coming from man, society and state; on the other hand, the curricula seem to be in need of slight corrections and amendments.
In future, what we will need will be a new model of effective collaboration within educational community in order to ensure optimal quality to vocational teacher training courses, occupational training and continuing vocational education.

6. Recommendations

The recommendations above may be of value to educational institutions' management:

1) For evaluation of whether a certain vocational teacher training lives up to what is expected of it;
2) For a better identification of further research needed in the area of vocational teacher education and its development;
   The results of this paper may be used by researches concerned with the problems of the contents and structure of vocational teacher curricula.

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