

Engineering Master's Graduates as Future Managers in New Economy

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The article describes the following problems of Master's Degree training in management-development of professional management competencies, requirements for undergraduate education, responsibilities and tasks of the Master's Program instructor, business- science-education integration in improving Master's student training.

Key words: Master's Degree student training, development of professional competences, the requirements for undergraduate educational process, the responsibilities and tasks of the head master's program, business, science and education integration.



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Not with standing today's situation in the education system, many Russian scientific-education communities have acknowledged the fact of changing this system itself. Russia's integration into the Bologna convention is an important step towards the education reform. In other words, the education reform has been adopted; however, many are not satisfied with the procedure itself and the results, which could be considered as only intermediate ones. Even though the majority of reform tasks have not been accomplished, the attitude in separate university activity areas has intensified. For example, one education reform target includes the decrease of not only state but also private universities; however, statistics indicates otherwise (Table 1), while the number of full-time students has really decreased.

Despite the continuous education reform, the problems within the universities and institutes have not diminished, but have only been partially solved. Let's not elaborate on global problems existing in education institutions, but settle on those problems of Master's Degree training in management which embraces all these institutions. These problems involve both the management knowledge itself and the

reluctance of instructors of different Engineering Master's Programs to implement management as a major into such programs; whereas, employers devote enormous attention to the development of knowledge, skills and abilities of future Engineering Masters in management.

Traditionally, rejecting "Management" as a subject and misunderstanding modern professional management competencies resulted in the fact that such a course as "Management" in Russia was related to economics and was considered to be an integrated part of this subject. Only recently, "Management" as a subject was assigned to the following speciality 08.00.05 "Economics and Management of National Economy". Concepts and methodological approaches of modern management has been changing, updating and being subjected to "diffusion". It is of critical importance how the future Master students and/or working managers evaluate different management phenomena in the epoch of modernism and / or post-modernism in responding promptly to the changing problems. Executives at different organization levels should know the very problem-solving remedies in modern management.

Table 1. Basic Activity Indexes o (RF) for 2006-2008 (Russia and Statistics. Rosstat, 2009)

Indexes	2006-2007	2006-2007	2008-2009
Number of universities and institutes, total	1090	1108	1134
Including: state (public)	660	658	660
Non-public (private)	430	450	474
Number of students, total (thousands)	7 310	7 461	7 513
Including: full-time students	3 251	3 241	3 153
Including: evening students	291	280	269
Including: part-time students	2 443	2 532	2 637
External studies	147	155	156
Per 100 thousand -number of university students (thousand)	514	525	529
Number of faculty staff in public universities	334	340	341,1

Up until now a manager was “labeled” not as a person coordinating processes, people and resources, but as a professional fulfilling specific functions stated in the employment position instructions of this or that enterprise and/or organization. These functions often are irrelevant to the pragmatist interpretation of the manager’s tasks and goals, while the manager’s performance results are considered by the achievements of his/her assigned team. He / She should be able to organize and inspire his/her employees within the essential course of high-performance teamwork, initiating management decisions and remembering that “... the most qualified and valuable resource for any enterprise are those working here.”¹

The employers present various requirements for the future Master-graduate attributes and professional competency profiles in management. However, the major requirement for the future modern manager in engineering and technology remains the acquired knowledge and skills in high-performance of assigned management targets, which in its turn promotes the following professional management competencies:

- **Cognitive** - necessary professional knowledge (theoretical, applied and specific professional) and performance skills of basic modern economic and management

knowledge, as well as, practical application of traditional and modern management methods and functions within one’s engineering profession;

- **Executive** - application of acquired knowledge in professional problem-solving, which includes the ability to identify, design optimal performance sequence in achieving intended target; plan, evaluate and monitor one’s activities; make decisions independently; introduce and effectively apply the resources of different groups, etc.;
- **Communicative** - negotiation skills for business communication and interaction, assuming a high level of interpersonal communication, applying knowledge and skills of information-technology communication in solving different management problems within engineering and technology domain;
- **Individual** - proficiency level of self-cognition, self-actualization and personal development methods not only in engineering areas, but also in management theory and application; endeavor to improve one’s performance, commitment for career advancement, ability for self-motivation and others;
- **Reflexive** - commitment for professional reflexion (self-consciousness), understanding of cognitive

¹ Druker P. (2002) *Management Goals in XXI century. M. P 166.*

activities and coping with thinking stereotypes; knowledge of the following reflexion types:

- Retrospective - critical re-evaluation of past experience (possibilities and forwardness in embracing global manager experience);
- contextual (situational) – actual evaluation of existing situation, understanding of possible applications of modern methodological approaches in one's engineering and management activities;
- perspective - insight and vision of management results, perceptive choice of effective strategies, i.e. an algorithm in achieving target goal, consistently pursuing moral rectitude and behavior standards, etc.

This competency structure identifies those objectives in choosing fragmentary content and methods of cognitive activity in shaping definite professional skills and abilities in the management domain. Significance and applicability of this or that management competency depends on the Master-graduate management activity orientation, organization /enterprise profile where he /she will apply one's skills and abilities and, of course, extrinsic business community. Target-orientated training of Master students in this or that professional area within the framework of today's management domain, could be achieved partially throughout the Master degree course and only in that case if future place of employment is determined. Nevertheless, basic knowledge of different practical approaches in project management and applying this in various organizations/enterprises, as well as, skills in synthesizing and updating essential competencies could be taught throughout the Engineering Master-graduate degree course.

The question arises - what domains and sectors of national economy could employ Master-managers with such competencies? There are three activity domains of future Master-students: research, education and practice in different businesses. Activity domain of today's manager could embrace all ex-

isting structure-clusters within the Russian economic sector, including venture fund committees, public organizations, etc., as well as, different institutions of business infrastructures. Skills and abilities in task-oriented management of organization people and resources are always in demand.

The issue of the day in Russian education institutions – process and education mode retardation of Master's degree programs to existing changings in economy and management. Only recently more and more attention is being paid to Master degree programs in Russia. At the moment the situation is such - adopting foreign teaching methodological experience and accumulating domestic experience in this domain. The integration of foreign teaching methodological experience in the context of today's Russian education reality triggers "a rule of thumb". Nevertheless, innovation approaches in research-education training of Master-students have already been implemented into Russian universities. For example, from the first day of their studies in Tomsk Polytechnic University students already apply their knowledge and skills in competing against each other in future job searching.

The characteristic feature of organizing the research- education activities within Master's degree course (program) is the personal responsibility of the Program instructor in organizing the student training process itself. Fostering leadership skills of future Master-students, the instructor is stimulated to apply individual approach to each student. In other words, the renewed mentoring has emerged not only in universities, but also in enterprises. The Master's instructor, as a mentor (tutor), is responsible for the systematic acquisition of qualified student knowledge and skills. The professor (mentor) has to collaborate, intercommunicate and participate in the future Master-student professional activities far more than that of post-graduate. The instructor's role involves the following aspects: develop and foster interest in research activities,

further self-learning and shaping one's research, engineering and management career.

Another characteristic feature – targeting and orientating training from a perspective of perception and understanding that all program courses are future research topics of Master's dissertation, the elaboration and implementation of which are important in the theoretical and practical focus of the future profession. Even this process without management fundamentals is impossible!

The development of a competitive environment is also important in the Master's training process. Such Master-students should be "inflected" by competitiveness in such aspects as learning performance, publishing papers, winning scholarships, progressing in practical experience, etc. In this case, every instructor should work out the student incentive system and maintaining competitiveness. The following incentive system version could be suggested: graduate research scholarship (including the instructor); designing database of different nominal and state scholarships and document samples package; stimulation of active Master-graduates by best industrial R&D internship placement and job vacancies; proposal of state-financed post-graduate program; financing internship abroad and so on.

Although such aspects as competitiveness among students and individual approach of the instructor to each student are very important in the training process, teamwork abilities are also vital. Another important aspect is to determine what role each Master applicant would be involved in this or that team. In this case, the psychological personal evaluation of the Master-student and his/her role in the team should be defined as well. A self-governed student team is challenge-motivated and attained to unparalleled results, importing high motivation in project-solving and maximum efficiency in incorporating personal resource of each team member.

A vital professional attribute of any future Master-graduate in manage-

ment is the level of communication, i.e. to communicate effectively and make effective presentations with the engineering community and professional meetings. Nowadays, most students are unable to express themselves. Thomas Schlair (Swiss specialist in rhetoric) wrote: "the problem of phobia creeps into our head: one should switch over to another channel and trying to say at least two words in the presence of some people is luck". He suggests four rules in speech making:²

- major –body language (arms crossed, hooded look, grit teeth result in perplexity and suspicion of the audience and not catching its attention);
- brevity is the soul of wit (Demosthenes quotes" talk a lot but say nothing");
- the simpler - the better (don't show huffery-puffery if in a few seconds you out-talk routinely);
- don't fear to joke (something funny remembers well, presentation should be "flaring" but not clichéd).

It is important to teach students to have ready impromptu. It is well known that the best impromptu is the one that is thoroughly considered and planned.

As business and the whole world exist in the epoch of constant and persistent changes, students should understand and accept these changes within this or that organization and this is the target of the mentor- instructor. Both the Master degree program and the training process itself are in constant dynamics. In accordance to business requirements and response to time, the introduction of new and updated courses is the basic principle in developing and implementing any Master degree program in different engineering profiles. As a rule, positive changes within any organization are achieved by those managers who are leaders. Thus, another novelty-Master-student training involves the

² Abashkina O. (2011) *Eloquent Bellowing or Who Needs Rhetoric at Work. Guideline for Personnel Management* № 9. pp. 125–127.

alignment of personal authoritative and leadership resources to achieve target goals. Leadership as a competency of manager authority facilitates employee motivation in reconciling their personal goals and desires to the enterprise / organization targets, and then how they understand, accept and adjust themselves to those changes in the external environment and in the enterprise / organization itself.

The urgent problem of today's higher education (including Master degree programs) is the fact that many universities show no interest in collaboration with businesses. Even a high demand in human resources cannot solve those problems existing in business today: objection to professional graduate competencies; interest in developing joint projects; further Master-graduate mentoring in the workplace; integration and cooperation of attitude development of those employees working not just for results, but working for effective results.

Besides this, it is important that the Master-graduate understands the problem-solving of defining the priorities in mini-business processes, i.e. what methods and how these methods ensure the fulfillment of target-goals in such training business-processes and their re-engineering. Instructors of Master degree programs should find areas of common interest with regional and territorial businesses to involve their executives in collaboration with Master-students in feasible production- training projects.

Resource efficiency, as a critical problem, has been discussed in the scientific-academic community and working environment. The future man-

ager should have management knowledge embracing such resource groups as human resources, physical resources, financial resources and information resources relevant to their shortage and ascending priority of efficiency resource utilization under conditions of tightening competitive environment. There is also another important resource - time. Highlighting time as a resource fostered an entirely new domain in "Management"- new methodological orientation "Time Management". The management mechanism of personal time and employee time varies and must be studied and already applied by future managers within the Master degree training program itself. People with a high experience level of personal time management achieve higher results and pursue life-long learning, surpassing existing environment changes.

All these problems concerning future Master-graduate professional training in managers of different levels (from project to large enterprises) could be solved or mitigated only through the integration and interdependent systematic interaction of scientists and specialists of engineering profiles, specialists and scientists in economics and management. Faculty staff of different technical departments should acknowledge the integration of economic and management. There are also other issues embracing the training process of future Master-graduates which require solutions by leading economists. For example, a broad range of financial, organizational and methodological provision for this process which should and must be studied.

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