A model of self-education skills in high education system

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Abstract

This paper is dedicated to the problem of formation of self-education skills in the process of education in a system of higher educational institutions. The higher school faces the challenges of specialists training, which will be able to change the scientific-technical, and intellectual basis of our society radically through the new technologies introduction. Structure of self-education, readiness for professional self-education is main research questions. Self-education skills became a key factor of professional readiness. A.P. Chernyavskaya’s test was used to determine the degree of readiness for professional self-education. The test represents a questionnaire consisting of 99 questions and five scales (independence, information awareness, decision making, planning, emotional attitudes). We also used J. Rotter’s test of locus control. The group (5-10) which worked for one year for training company showed higher score in terms of scale of independence, decision making, planning. They also consider themselves to be more responsible for everything that happens in their lives, in other words, they able to successfully pursue their goals in future. We can assume that the formation of readiness for professional self-education through the training company is an important step towards a new quality in preparation of future teachers.

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1. Introduction

Ability to work with the information technologies, ability to familiarize in the information flows, to adapt to rapidly changing requirements for qualification of a specialist in any field of professional activity became the priority direction in the society development.

Nowadays, the higher school faces the challenges of specialists training, professional competence which will be able to change the scientific-technical, economic and intellectual basis of our society radically through the new technologies introduction.

One of the primary targets is the acquisition of permanent self-education skills by young professionals. Besides, self-education must be constant throughout the work activity life.

Considering the fact that over the past decades, the competence half-life declined sharply in all areas of cognition, knowledge of the specialist trained at a modern level obsolete. Consequently, the specialist cannot meet the up-to-date requirements without their constant update.

Due to unpredictably changing economic and political situation in the country which affect the fact that a young professional cannot rely on long-term work in one industry only. Due to this reason, it is necessary to acquire skills allowing to master a new profession within the shortest period of time.

However, the specifics of the education system is that it must be able not only to equip students with knowledge, but also form a need for uninterrupted self-acquirement of such knowledge, ability and skills of self-education, due to the constant and rapid update of knowledge nowadays, as well as independent and creative approach to knowledge throughout the entire active life. For this purpose, it is necessary to diversify the educational programs structure, by enabling everyone to build-up such an educational course that mostly fits their educational and professional abilities. It is important to remember that the cognition process should make people enjoy the finding a new outlook on the meaning of life, their place in it. It appears that the important problem of late XX – early XXI century is the problem of finding an appropriate organizational structure of the educational system and its institutions, which could provide a transition from the principle of “education for the whole life” to the principle of “education through the whole life”.

One of the possible solutions to this problem is to educate students to have a proper attitude to the professional knowledge and skills, form their needs for self-educational activity.

A range of researches is devoted to the problem of youth self-education is. While analyzing this problem, many scientists have concluded that secondary school does not make its graduates enough ready to the systematic education, that in consequence it brings a low skill level of self-education among the students.

Presence of active cognitive needs and interests, effective internal motivation of the personality to their satisfaction, development of substantial willpower for it, high degree of consciousness and organization are specific for self-education. Moreover, this cognitive activity is an additional one to the main occupation of a human being, although it is related and even caused by human being. A man realizes the insufficiency of available skills in order to resolve the arisen cognitive or practical problem, in this case the person resorts to one or another source of knowledge replenishment. We are not discussing the occasional finding an answer to occasionally arisen question, but a systematic cognitive activity.

Thus, self-education is the knowledge acquisition initiated by the individuals themselves in respect of the classes’ subject, volume and sources of perception, establishing the classes duration, as well as the choice of form of the cognitive needs and interests satisfaction.

Education/bringing-up process as a system of organizational training and education is destined both to enrich the students’ knowledge and train the future professionals about methods of their effective digestion, creative use in practice, finding the non-routine decisions to emerging challenges and tasks.

Educational process organization and performance of the standard classroom and laboratory studies are well reflected in the high school methodology. Instructional techniques to gain the self-education skills are developed much less.

Quality of the professional training result is regarded as a compliance of the professional preparedness of a student to the contemporary “challenges of time”, it is studied through the concept of “professional competence”. The need to form a new model of teacher’s professional training is obvious in the logic above.
Numerous studies of various models of professional labor may be combined into two groups (according to S.L. Rubinstein):

- model of adaptive behavior;
- model of professional development.

Where the model of adaptive behavior is focused on momentary response to external changes, and the model of professional development is focused on accounting and forecast of future changes. If the main purpose of the model of adaptive behavior is to develop the human skills to “fit” into the environment reality, then the model of professional development is focused on formation of skills “to go beyond” of a continuous flow of daily practice, that is to see, to recognize and assess various issues, to consider any difficulty as a motivation to develop.

It is known that until recently, the vocational education was based on the adaptive model logic. The current situation in education supposes the possibility to go along the logic of the professional development model within the competence approach. It means that the competent specialists are able to go beyond the subject of their profession, that they have a certain creative potential for self-education.

The competency approach is based on a culture of self-determination (ability and willingness to self-determination, self-development, self-education). As told by Yu.E. Kalugin “In our opinion, currently there is situation when need for self-education is growing due to changes in the society”. Several studies suggest that success of the “competent employee” is provided by skills and qualities characterizing the independence of personality:

- ability to find and use the information;
- analyze, evaluate the alternatives;
- logically arrange the problem solution way;
- orientate in unexpected situations, find new approaches to non-standard problems solving.

Independence must be combined with an active interaction of the individual in the group. Indeed, readiness to the professional self-education does not come by itself together with a diploma. It requires a diligent purposeful work.

Self-education is based on a various experience of a teacher as a fast growing professional, whose skills formation is continuously progressing from one stage to another. Traditional educational models fail because the experience which is associated to the teacher turns out to be enforced from the outside and therefore it is unsustained psychologically. This is opposed to the developing experience and going “outside from inside”, “productive and creative ongoing” (John Lewie).

Therefore, two types of professional experience can be distinguished: methodological (generalized experience of mankind, individual professionals reflected in the books) and empirical (personal passed subjective experience). Hence, if the experience of the acquired knowledge level is the result of one or another science or experiences of other people, then the subjective knowledge includes individually experienced and not always conscious moments of a real professional activity.

Due to this reason, in recent years, the need for optimal combination of different methods is emphasized, which allows the students to discover new knowledge as problems and at the same time not to miss the practicing of work techniques and methods to the level of skills. From the psychological viewpoint, a combination of methods is necessary to form the various types of students’ motivation as well.

The most important aspect of modern education is the problem of students’ motivation formation, which lies at the intersection of education and upbringing. This means that here, field of teacher’s attention is focused both on student’s studying and student’s personality development taking place during the training.

In its turn, the motivation formation is a development of ideals among the students, world outlook values accepted in our society, in combination with the active student’s behavior, which means the relationship of perceived and actual operating motives, the unity of word and deed, proactive life philosophy of a student.

Training motivation consists of many sides, changing and entering into new relationships with each other (social ideals, meaning of pupils’ studying, their motives, goals, emotions, interests, etc.). Therefore, the motivation formation of is not a simple increase of the positive or negative attitude to training, it is the complexity of the structure motivational sphere being behind it, impulse of it, establishment of new, “more mature” and sometimes contradictory relations between them. These individual aspects of the motivational sphere (and complex, dialectical relationship between them) must become the subject of teacher’s control.

The forms of educational activity listed above excite all kinds of cognitive motives, they cause various kinds of
positive emotions from new, more “adult” forms of work, from new types of relationships with the teacher, and create an atmosphere of ease and relaxedness of students, they activate the goal-setting processes, when the students are not afraid of independent goals setting, etc.

The main reserve to form all kinds of educational-cognitive motives and self-education motives is the activation of students’ studying activities. Such activation is possible in various forms of students’ educational activity. For example, such as:

1. Educational activity under the teacher’s guidance, when all components of educational activity (educational objectives, educational activities, self-control and self-education actions) are performed and understood by assistance of a teacher. This is facilitated by numerous exercises and issues for analysis and transformation of educational activity that can be used by teacher in the course of training.

2. Independent activity is implemented when one or more of its components are carried out by the student without teacher’s support. Inherently the independent activity is a work carried out without direct involvement of a teacher, but instructed by the teacher within the time specially dedicated for it. Generation of students independent activity is facilitated by the following issues and tasks of the teacher to ensure the transition of students from one component of educational activity to another one.

3. Self-educational activity of students is a cognitive activity directed by the students themselves. Students make it in accordance with their own objectives, motives and goals. Self-educational activity has different levels: it can “accompany” the education, it can be present as single episodic forms of self-education and, finally it can turn into a special deployed activity of a student on self-training and self-education. All these levels need to be guided by the teacher.

2. Purpose and Methods of the study

The purpose of present research was to study a model of self-education skills.

Let us enumerate the methods of student’s independent work, which formation is preferable to develop a positive motivation of education:

– methods of semantic processing of text, integration of educational material, distinguishing its root ideas, principles, laws, perception of generalized methods to resolve the problems, independent formation of problems system of a certain type by students;
– reading culture techniques (e.g., the so-called “dynamic reading” with large syntagma) and hearing culture, methods of brief and the most rational notes (extracts, plan, thesis, summary, abstract, report, review, common methods of book work);
– basic memorization techniques (structuring of educational material, use of special mnemonics techniques based on imaginative and auditory memory);
– attention concentration/focusing techniques supported by different kinds of self-control used by students, phased activity review, distinguishing of checks “units”, checks order, etc.
– general methods of additional information search (work with bibliographies, directories, dictionaries, encyclopedias) and its storage in the home library;
– methods of preparation for examinations, tests, seminars, laboratory work;
– methods of rational time organization, time consumption account, reasonable alternation of work and rest, difficult and easy, oral and written tasks, general health and hygiene rules (schedule, walks, workplace housekeeping and illumination).

All these forms of work contribute to the establishment of mature cognitive motives, which are the educational-cognitive motive and self-education motive, goal-setting (associated with performance of individual educational activities and their self-control) are accompanied by positive emotions. Activation of educational activity of students is the main way to activate the different types of their cognitive activity.

Thus, the problem to form the motives of students’ self-education activity seemed to be relevant due to new concept of vocational education. Development of a problem of self-educational activity motivation is particularly important, since the motivational sphere has the crucial role in the development of cognitive power and students’ empowering with knowledge.

Hence we can distinguish that needs, motives and goals can be the components of motivation. In its turn, the
need is a state of human body, human personality, social groups in the society expressing the dependence on the objective conditions of their existence and development. Motives are the variety of events and conditions causing activity of a subject. Goal is an ideal outcome to take one or another actions, their ideal internal motive. Due to this reason, the analysis of scientific literature, questionnaires and inquiry of students allowed to establish the range of motives (education and self-education) as possible elements of self-education motivation structure, and then to systematize them using the existing classifications. In other words it means to systematize considering our perception of self-educational activity subject matter and motivation as materializing the unity of subject (subject-object) and mutual (subject-subject) relations.

We have distinguished five groups of self-education motivation:
1) world outlook;
2) duty, responsibility;
3) cognitive;
4) prestigious;
5) forced.

Each motive of knowledge is characterized in terms of subject orientation and socio-behavioral aspect. Some motives are more represented by relations, thus the leading part is the subject areas (cognitive motives), other motives are represented by the mutual relations, and the leading part is the social-behavioral aspect (motives of duty, responsibility, and prestige). Nevertheless, the motives of duty, responsibility are inconceivable without the subject orientation, as for the cognitive motives, they have social and behavioral characteristics. Therefore, our analysis showed that while assessing the formation level of various cognitive skills, many students noted that reproductive abilities (ability to memorize quickly and repeat the information without changes, ability to solve the standard tasks, etc.) were developed by them quite good. Meanwhile according to students, the skills required for a productive cognitive activity were formed poorly.

Thus, becoming students, people just out of school are getting involved into completely new forms of studying which require them to think themselves, comprehend the verbal material, make summaries, self-study the primary sources, textbooks, prepare for seminars, practical and laboratory classes, etc.

By virtue whereof, for detailed diagnostics of skills and experience and to develop the special courses of the specialty “050120 – Professional Education”, the faculty of the Department of general engineering disciplines and labor training methods of Karaganda State University named after E.A. Buketov had developed the methods involving the personality affecting the cognitive activity (dedication, creative activity, initiative, exactingness, persistence); constructive skills (ability to organize personal activity, ability to improve personal mental abilities); gnostical (ability to discourse logically, to integrate knowledge into the system, to work independently with a book, to generalize, to solve non-standard problems). At the same time, the students evaluated these nature and abilities according to the extent of need to study at the university and degree of personal maturity.

It turned out that false impression about the structure of mental activity and inadequate assessment of individual components significance were specific for the majority of first-year students. For example, such personality habits as initiative, creative activity and skill for productive level of activity sequences received lower grades than ability to memorize and repeat the information without changes, to solve the typical tasks, etc.

Therefore, in order to develop the ability for self-management, it is required to have the educational methods determination to change the goal-setting and motivation of cognitive activity of students, creation of their prospects to improve the mental work culture, correct understanding of the cognition process structure.

It is quite obvious that the formation of motivational part of cognitive independence implies an indispensable organization of the efficient independent activity of students. Formation of the respective motives is impossible without direct involvement of students.

However, considering the significant side of knowledge and skills acquiring process within a certain discipline at the university, it is possible to outline the following groups of the educational material content:
1) basic knowledge – “introduction knowledge”, or general information;
2) fundamental, methodological knowledge covering the essence of phenomena, concepts, processes, general laws and ways of life;
3) “specific knowledge”, i.e. various demonstration of discipline content related to some system based on fundamental methodological knowledge;
4) “knowledge-skills” defining the professional qualifications and experience.
In accordance with this classification, the knowledge acquisition process, i.e. study of the subject and particularly special courses is naturally divided into the stages for each student, as follows:

1) introduction to the goals and objectives wording of the course, introduction to the system of definitions, concepts, phenomena described in the discipline, clarification of the discipline importance in a number of other disciplines constituting the basis of theoretical and practical training of future specialists;
2) studying of the basic theory and methods to resolve the typical problems (typical modes of activity);
3) study of professional activity experience of such profile specialists under certain conditions and tasks;
4) acquisition of professional skill at the repeating level and creative level.

In this point, it is important to note that at these stages, the psychological essence of students’ cognitive activity process is not the same.

The first stage is dominated by the process of fundamentals perception and awareness of areas of practical use of the discipline, i.e. initial motivation to study the subject, in this case according to the experience, the material acquirement is quite limited even at the level of simple memorization.

The second stage is characterized by independent critical understanding of the basic theoretical arrangements of the discipline, clarification of features, efficiency and effectiveness of the basic theory application (both in the conceptual and the operational, activity plan) to typical problems that can and must be resolved based on knowledge and activity methods constituting the subject of a discipline.

At this stage, the students comprehend the logic and methodology of the activity which should form the basis of their professional qualification. Consideration, rethinking, independent reclassification of basic, fundamental knowledge about the subject and methods to study and use of concepts, phenomena, methods that characterize the discipline and its respective area of science and technology by the student finishes by formation of individual “tool of thoughts” – the system of personal methods and techniques, rules and templates used by the student in order to keeps the general and specific approaches in mind to resolve the set targets in the discipline.

Peculiarity of the third phase, which can continue after completion of the discipline training process arranged by the teacher is a conscious self-evaluation of effectiveness (verification) built in the previous step of “tool of thoughts” while studying of the professional activity of teachers and masters of a certain specialty at the practical area, as well as during solving the individual targets, tasks, problems set by the teacher or educational situation.

During this verification, the student introduces some corrections and changes into personal perception and methods of activity within the discipline; the student clarifies the importance of the obtained knowledge and skills for more qualitative and qualified solution of complex problems defined by the professional characteristics of student’s specialty.

The fourth stage is self-training and self-improvement in the educational and professional activity.

It is obvious that at three first stages, the training quality will be defined by that a professional and emotional state of students, which can cause either creative enthusiasm and deepest satisfaction in labor activity, or indifferent, passive, and sometimes explicitly negative attitude towards their labor of young specialists. In this point, the training process is closely related and intertwined with the process of active, creative personality development, not formally, but essentially.

It should be noted that professional-teaching experience (PTE) of the Department of general engineering disciplines and labor training methods shows that the effectiveness and quality of the educational process is the higher, the better it is arranged and independent cognitive activity is provided. It follows that organization and provision of understanding of fundamental, methodological knowledge, support to each student in their work to build-up the “tool of thoughts” is the primary and most important task of every teacher.

And it means that student can obtain the fundamental knowledge only in the process of self-study firstly of the basic theory and then based on it – methods of typical problems solving, i.e. studying of standard models of activity. For each student this process is characterized by the tempo specific for them based on previously mastered and colored with individual psychological characteristics of mental techniques ways.

The methodology by A.P. Chernyavskaya was used to determine the degree of readiness for professional self-education. The methodology represents a questionnaire consisting of 99 questions and five scales:

- independence is an understanding of personal strengths and weaknesses, ability to identify them internally and make the their best, ability to make decisions, take responsibility;
- awareness is the knowledge, information awareness (decisions can be made by the informed person only);
decision making is an ability to analyze the past, predict the future;
planning is an ability to plan the steps in professional activity, professional growth and development;
emotional attitude is a joy of the achieved results, “sound excitement”. All questions have been tested for the difficulty and discriminatory power and meet the criteria of tasks screening methodology. The methodology has the constructive and criteria validity.

3. Results of study

We analyzed 40 students of S. Seifullin Kazakh Agro-Technical University of Astana. They had been divided in 2 groups (experimental (5-10) and control (5-1). In this article, we are not going to present all the results, but only those that clearly show the difference in terms of groups 5-1 (it was not involved in the training company activity) and 5-10 (year of working for the training company).

Table 1- Readiness for professional self-education

| Group No.       | Experimental group 5-1 | Control group 5-10 |
|-----------------|------------------------|--------------------|
| Awareness       | 10,1                   | 9,4                |
| Independence    | 6,4                    | 7,2                |
| Decision making | 10,6                   | 12,7               |
| Planning        | 11,3                   | 11,4               |
| Emotional attitude | 7,5                  | 7,2                |

5-10 group which worked for one year for training company showed higher score in terms of scale of independence, decision making, planning. From our perspective, the willingness to professional self-education was affected as well by the subjective control level, which was based on the understanding that people differ from each other according to the fact where and how they localize the control over events significant for them. J. Rotter identifies two types of localization: external and internal. Subjective control level is associated with a feeling of strength, dignity, responsibility of person for occurred situation with self-respect, social maturity and individual independence. The methodology is a questionnaire consisting of 44 questions and seven scales: scale of overall internality, achievements internality, failures internality, family relations internality, industrial relations internality, interpersonal relationships internality and health and disease internality. Let us present the results obtained in groups 5-1 and 5-10.

Table 2 - Subjective control level

| No.    | Scale index               | 5-1 | 5-10 |
|--------|---------------------------|-----|------|
| 1.     | Overall internality       | 4.7 | 5.5  |
| 2.     | Achievements internality  | 6.2 | 6.7  |
| 3.     | Failure internality       | 4.7 | 5.5  |
| 4.     | Family relationships internality | 6.0 | 6.3 |
| 5.     | Industrial relations internality | 4.1 | 5.1 |
| 6.     | Interpersonal relationships internality | 6.3 | 6.1 |
| 7.     | Health and disease internality | 4.1 | 5.6 |

This study showed that the students in 5-10 group who passed the pedagogical practice using the training company technology, compared to group 5-1 students who were not involved in the training company operation, consider themselves to be more responsible for everything that happens in their lives, in other words, they able to successfully pursue their goals in future, they tend to blame themselves in problems, considering their actions an
important factor to organize personal occupational activity, in relations within the team, in their moving forward. Also it can be added, that “selfhood” is prevalent among the students of 5-10 group. We want to believe that a considerable part belongs to training company technology. In summarizing, we can assume that the formation of readiness for professional self-education through the training company is an important step towards a new quality in preparation of future teachers. As told by the Chinese Philosopher, Lao Tzu: “A journey of a thousand miles begins with a single step”.

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