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Methodical Peculiarities Of Development Of Students' Cognitive Independency

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Abstract

Possibilities of formation of creative competences of students in vocational training. The article deals with possibilities of students' independent cognitive development at studying any discipline in higher education institution. First one should check presence and volume of research and creative skills making a basis for formation and development of cognitive activity of students, and also their ability to use them for solving problems typical for the given field of knowledge. In the course of methodical preparation of students – future teachers of vocational disciplines it is advisable to start works on development of cognitive independence from the very beginning of teaching a course of technical disciplines teaching methods of. For the organization of cognitive activity of students on lectures, a teacher should tell students about their future work purposes, to name and explain main stages of students' activity on mastering know ledge, tell about a need of acquiring a system of knowledge and explain the value of this system for their further practical work.

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Introduction

On lectures for materials cutting, machines and tools (MCMT) it is advisable to discuss those methodical questions that should provide a conscientious attitude of students to their future profession. Lectures should be of a problematic nature and stimulate students' creative independence i.e. a process of teaching methods on training RMSI should be focused on the development of cognitive independence and upgrade of professional readiness.

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The last one should be systematical, purposeful, episodically, gradually preparing a student for a higher level of a cognitive independence development. From this point of view the course of teaching (MCMT) should be based on a fundamental concept of teaching technical disciplines as a methodical system. Its components are purposes, contents, forms and well-formed communications between them. In the course of students' cognitive independence development works on lectures for teaching methods (MCMT) it is advisable to include a system of professional skills that should be the first aim on practical, laboratory lessons and during individual - group independent works.

Laboratory – practical classes on teaching methods should serve as a means of formation a creative cognitive independence at studying materials, education guide and textbooks. This idea should be realized by means of special exercises that should familiarize a student – future teacher of the vocational training, in the laboratory of teacher's activity, promote a development of their professional cognitive independence, effective organization of independent work.

On the first practical lessons it is necessary to carry out a diagnosis of students' cognitive independence level of development. In order to achieve it is recommended:

- To detect an orientation of a cognitive motive by means of giving them a task for a choice (a task of different extent of creativity) and characteristics of self-educational activity of a student (availability of its relation with a future profession, goal-directedness and systematicness);
- To define a degree of consciousness of knowledge assimilation (on subjects passed), using test with three tasks: on reproduction of knowledge; on using it in certain situation or on a sample: on application of knowledge in changed situations demanding a creative approach;
- To reveal a level of a mature ability to allocate main things by means of such tasks as: «Separate a chief idea in the content of a lecture …», «Name the main idea of the last lesson». Also it is possible to do tasks with the use of a concrete discipline material, type of tasks «on analogy» allowing to reveal a level of abilities' maturity to analyze, define and select similarity and distinction elements;
- To define a level of abilities' maturity to plan and carry out self-control. There to it is necessary to suggest students to make up a plan of their work for a week, register the time and quality of performance; to find out, what self-examination methods students use and on a concrete mathematical material to check a level of possessing these methods.
- to define, whether a student can overcome cognitive difficulties. For this purpose it is necessary to take students under observation on lessons, especially at the performance of difficult types of educational and cognitive activities. When the methods are well mastered it is necessary to check how they make summaries of lectures and practical works (terms and quality of performance of homework, tasks on independent works). We recommend the following supervision indicators: intensity of work on lessons (especially when studying a difficult material), aspiration to carry out a given task, a systematicness of doing homework tasks.

Having analyzed the data obtained, it is necessary to define what side of cognitive independence of each student is worse formed in order to pay a special attention on these «weak moments» and to distribute students on groups with an approximately equal level of cognitive independence maturity. It is recommended to distribute students on three levels of cognitive independence maturity as it facilitates a subsequent selection of individual tasks.

Actuality

It is advisable to use a method of defining levels of cognitive independence maturity when summarizing results of a subject mastering in the end of a semester.

The next stage should be connected with the organization of works on students' cognitive independence development on practical various subject lessons, including of a method of teaching MCMT. At this stage we recommend:

1. When defining teaching and educational process objectives to single out a cognitive independence development as a separate objective and define tasks connected with development of weaker components
2. At the selection of the contents of a training material to single out knowledge and abilities mostly significant for mastering a chosen profession and develop tasks that ensure learning of the given material; when making the analysis of the training material contents it is also necessary to define methods basic for the given cognitive activity course and develop or select from the existing education text-books a system of tasks, allowing to master these methods. It is also necessary to include tasks, focusing them on independent search (for example «Analyze the tasks given in section … and define which decision will help them to do the rest», «Define, what methods will help to solve this problem»);
3. When selecting methods, forms and teaching aids to determine creative types of educational and cognitive activities for students to participate them at this stage. Special attention should also be paid to planning students' independent work during a semester, including making messages, reports, and course-paper performance. To provide terms and forms of control on students' independent work.

Goal

Conducting classes on of cognitive independence development is advisable to in the following way:

1. On the first lessons purpose a statement of objectives and intermediate control – a teacher, gradually involving students into this kind of activity, carries out a performance control. Then students are offered to plan a lesson independently according to objectives put by the teacher. During a lesson it is necessary to pay attention on students, how they realize a plan of lesson in case of need correct it together with students. At the end of the lesson results are summed up; the students' attention should be first focused on the level of progress reached on the lesson. Independent work of students on other lessons should be similarly organized. On the following stage within the named topic students should put goals of the lesson independently. It is important to request students to define the objective of any kind of work. At the same time students are offered to make plans of their out-of-class independent work (for a week or a month). It is recommended to work out methods of self-control in a serial way. When checking homework it is recommended to put questions like:

«What methods of checking you used at home?»

2. At putting a specific goal of students' educational and cognitive activity a teacher sets up guidelines on mastering knowledge. Besides putting a goal of the lesson, especially when mastering methods of cognitive activity it is recommended to put problem questions orienting students on mastering or search of a certain method. Determination of a goal is supported with a performance of specially picked up tasks;
3. At the management of independent work performance a teacher should give students a direction on overcoming cognitive difficulties. In each case it is recommended to set before students really attainable objectives. At the first stages when doing out-of-class independent work students' self-control work at their educational and cognitive activity should be combined with a systematic teacher's control.

Methodical recommendations on students' cognitive independence offered by us can be included into a teaching- educative process on all institute courses. Their application doesn't demand a reorganization of existing training programs and a many changes in curricula. A curriculum for engineer-teachers has been made up and introduced into educational process. The use of recommendations for the development of students' cognitive independence on all forms of lessons as our experiments show not only facilitates a teacher's process of preparation for the lesson and its giving from the point of view of the development of this quality of students personality but

also helps him to achieve more common goals – to form and educate specialist thinking creatively and independently.

The students from control groups who failed to cope with the solution of tasks, unlike students from experimental groups, displayed a lack of competence and in solving problems of intra and inter subject character i.e. it testified that a level of independent cognitive and practical activities remained on the same level.
At the final stage of a training experiment we took such efficiency-in-learning indicators as academic progress and criteria of maturity of independent cognitive activity:

- Volume, depth of understanding and students' efficiency of knowledge;
- Level of development of students' intellectual activity and independence during study;
- Level of mastering rational ways of intellectual actions (analysis, synthesis; generalization of a studied material) and abilities to work with a training material (ability to carry out comparison and matching of basic and minor elements, to state about the course of performance logically).

Conclusion.

So the aforesaid data show that the offered systems of independent works on practical lessons in experimental groups favored to the improvement of quality of knowledge, formation of abilities, skills and also to getting a certain experience in students' independent cognitive and practical activities on the said faculties.
The carried-out experimental training showed that the results received by application of experimental systems on organization of students' independent work on MCMT lessons confirm its efficiency in formation of knowledge, abilities, skills and development of creative independence experience.

Students from experimental groups surpassed indicators of students from control groups on:

a. Volume of knowledge, its effectiveness and stability, independence in application of knowledge according to their functional goals;
b. Ability to operate with systems of knowledge in new situations;
c. Ability to carry out intra and inter subject communication at the solution of tasks;
d. Level of mastering intellectual operations and rational methods of cognitive activity, in particular, abilities to analyze, generalize, and also to extract independently new information, relying thus on earlier acquired knowledge;
e. Degree of maturity of organizational skills (work with technical literature, distribution of a time budget), systems and rhythms in work.

Students from experimental groups have shown an increased intellectual activity and independence that in cognitive activity displayed in form of increase interest to an independent mastering of knowledge and in their ability to apply the knowledge in new situations. It can be confirmed by a successful use of knowledge and skills acquired by students from experimental groups in their previous training in situations caused by the novelty of a studied material. In groups where were applied experimental tasks a quality of education considerably improved: a percentage of good marks have increased.

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