

Ways of qualitative training of skilled metal workers in vocational education

In the teaching and the production process during the teaching of theoretical material and practical lessons, teachers are working with students processing technologies details of devices that control the boundary situations that are, firstly, fault-tolerant, and, second, recording the act already completed action. This control system does not satisfy the basic requirements of production - the prevention of critical situations. Therefore, it is important to implement devices of high speed that can rival their high-speed analysis of metalworking processes. Achieving high capacities, as a constant process may only develop appropriate measurement and control subsystems and modules senses overall tracking and control process, which are subject to high accuracy and performance in terms of overall process control metal [1]. Characteristics of such control systems must meet the conditions of modern, reliable, economical power, speed, adaptability to a range of equipment and physical and chemical properties of materials.

This is why it is necessary to implement newly developed senses of measurement and control systems [1-5] training and production process in vocational schools to train professionals metalworking. Using these devices makes it possible to get the best quality of final product machining and large economic impact. For example, the destruction of the tool for machining centers always cause the destruction of the spindle (90% of cases). At an average cost of machining centers (approximately 250 000 to 500000 USD) Spindle repair cost is about from 25 000 to 50000, representing about 10% of the machine, excluding simple processing center. Of course, it is possible to partially avoid emergency situations in the metal processing, based on known characteristics of stability, cutting tool and properties of the material. However, complete avoidance of such situations without the presence of instrument control devices, components and equipment is not possible. Thus, the actual problem to train skilled workers with modern metal is to study the latest developments senses measurement and control systems [1-5], which use an opportunity to get quality of final product machining.

Occupations also require appropriate direction fast motor reaction, spatial perception, and high level of coordination, physical fitness, and visual memory. At smiths, turners, milling and other metal profile of skilled workers should be formed

as - diligence, discipline, responsibility, independence, patience, precision, wit, ability to quickly orient and evaluate the situation and others. In the process of metal and the formation of the product in the form required by machine processing of increasing the burden on small muscles, increases speed and accuracy of movements, complicated program of action. Performance features are complemented by planning calculations, using drawings, which imposes higher requirements for the qualification of the employee. Formed labor skills and abilities allow workers to perform complex operations with necessary precision, speed and minimal efforts.

When studying the kinematics of movements, it was determined that the rate of movement depends on their direction and trajectory [6 -7]. Differentiation labor received its expression in a stream-conveyor organization of production, where high performance is ensured due to automation of motor skills, minimize time on operations, given the rhythm and pace of work. Therefore, movements have to be spread evenly in space so that they used within the optimal physiological mobility of limbs. The labor movement must be carried out within sight. Simultaneous movements of both hands should be symmetrical, and some elements of movement - smoothly linked. Cost of labor movements achieved by the symmetric placement of hands and feet worker the vertical axis of the body. Any shift in trajectory motion requires additional muscle tension to maintain the working posture.

Thus, the introduction and development of more optimal movements during training and practice will enable future workers to intensive much better in its activities the production process for the manufacture of any product. This in turn will increase productivity and give economic benefit from its use. Automation of production processes leads to what are the main functions of human observation, control and regulation on the basis of perception and information processing. During contact with the subject of work by remote control forms between man and machine contains devices that convey information about the actual state of the manufacturing process and equipment for response workers (operator). This job requires a well-developed memory, will and creative thinking. Since the worker has to regulate and control the complex system of technological processes - increased its level of responsibility for taking, processing, acceptance and implementation of the solution. That is why the introduction of educational content production and educational process basic theory solving inventive problems [8] and modern control systems [1-5] will enhance the training of future skilled workers with vocational processing of metals.

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