SOCIAL SCIENCES. Psychology

CASE STUDY

Physiological and Psychological Development of the Primary School Pupil's Personality in the Process Labor Education

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Abstract

Background and Aim of Study: *The article deals with the problem of development of analytical-synthetic activity of the motor analyzer, formation of visual-motor coordination and general development of primary school students at technology lessons. Particular attention is paid to the study of the division of pupils' hands function when performing operations that require the usage of tools.*
The aim of the study: to check a number of objective conditions influencing the character of the interaction of hands, fingers and visual-motor coordination of students' at technology lessons by means of practical activity.

Material and Methods: *For the achievement of the mentioned purposes general scientific methods of theoretical level are used.*

Results: *Performing tasks at crafts' lessons requires a more flexible division of hands. The right hand in these cases performs the main function, handles the object of work with the help of a tool. The left hand holds the material. As a result of the study, some objective conditions influencing the nature of the interaction of hands and fingers, visual and motor coordination of students: the workplace, the properties of the object of work were determined. Analysis, division of each operation into separate movements contributes to the formation of a mode of movement that regulates labor activity.*

Conclusions: *In the initial period of teaching crafts, the main methods should be analysis and synthesis. But the peculiarity of these methods is determined by the laws of motor development of the child, the peculiarity of the formation of skills.*

Keywords: *technology lessons, motion analyzers, analysis, synthesis, primary school pupils.*

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Introduction

The most important feature of technology lessons in primary school is that they are based on a unique psychological and didactic basis – subject-practical activity, which at the junior school age is a necessary component of the holistic process of spiritual, moral and intellectual development (first of all, abstract, constructive thinking and spatial imagination). Initial technological education should enable a person to develop more harmoniously and live in the modern technological world. It was established long time ago that active physical activity with fingers has a beneficial effect on the whole body. About a third part of brain centers, responsible for human movement, is directly related to the hands. Developing of motor skills, we create the preconditions for the formation of many mental processes. Scientists who studied the activity of the brain, children's psyche, note the great stimulating effect of the functions of the hand. Works of Bekhterev (1928), Sechenov, Luria, Anokhin proved the influence of manipulations by hands on the development of higher nervous activity (Bekhterev, 1928, p. 247). Koltsova (1979) believes that the language part of the brain is formed under the influence of impulses coming from the fingers.

No other subject allows such a variety of movements of the fingers, hand bristles, as craft lessons. At classes, subject-practical activities develop coordinated movements - accuracy, agility, speed. Most intensively this happens in the age from 6 to 10 years.

In psychology and physiology there are significant achievements in the study of the development of children's self-produced movement. In particular, these issues are considered in the studies of Zaporozhets, Luria, Klimov, Abramovich-Lehtman (Zaporozhets, 1986, p. 260; Lunacharskii, 1958; Ilin, 2002, p. 384; Vygotskii, 1960, p. 500; Lerner, 1984). The current state of production imposes high demands for the level of human's sensory-motor development. The idea of sensorimotor unity, theory promoted by Sechenov, is very important for understanding the nature of human labor.

The accuracy of movements in the process of labor is determined by the nature of regulation. Sechenov created a materialist doctrine about the regulation of movements. He found out that the true regulators of movements are the sensory knowledge of a human, which are images of objective reality. Sechenov, considering the peculiarities of human's movements in manual labor, indicates that the role of the regulator is vision and muscular tangent sensation (Serikov, 1999, p. 216).

The aim of the study. To check a number of objective conditions that influence the character of the interaction of hands, fingers and visual-motor coordination of primary school students at technology lessons by means of subject-practical activity.

Materials and methods

For achievement of the mentioned purpose general scientific methods of theoretical level are used: the analysis of scientific literature with the purpose of definition of key concepts of research, analysis, synthesis, comparison; empirical – observations, fragments of pedagogical experiment; questionnaire for primary school teachers.

Results

The kinetics analyzer of a person has a very complex organization, peculiar only to a person. Work determines a person's specificity of muscular and articular sensations of. In the process of work formed features of the brain and the peculiarities of the structure of the human body. Features of muscular-articular sensations of a person connected with these peculiarities of structure and functions of an organism.

Execution of crafts' tasks requires more flexible division of functions of hands than performing tasks in writing, drawing, etc. In the division of functions of a hand on technology lessons, one can note the persistent and unstable phenomena. The stable division of hands functions is manifested when performing those operations that require the use of tools, for example, when cutting paper with scissors, sewing.

The right hand in these cases performs the main function, handles the object of work with the help of a tool. The left hand holds the material and takes it as it is treated. Unstable phenomena in the division of functions of hands are observed in the performance of those tasks that occur without the use of tools, for example, assembly of paper, modeling. In these labor operations, the right and left hands can be varied by functions depending on the spatial properties of the material being processed.

In the process of learning formed children's a certain type of functional asymmetry in the activity of the motor analyzer. Adults' functional asymmetry has already developed, as for children it is only being formed.

In the first form, there is a definite advantage of the right hand in comparison with the left in the reproduction of the given motion without the participation of eyesight. This particularly appears when the large movements are reproduced, when the hand should be removed 30 cm from the body. The right hand is much better than a left-hand for the remote space of the workplace.

In the second form, it is possible to note especially large differences in the indicators of the right and left hands. The right hand of the second-graders sharply reduces the amount of errors in the distant and in the nearest space in relation to the body. The accuracy of the movements of the left hand, although increases, but much less than the right. The right hand as a result of constant exercises in the learning of writing, drawing and other subjects greatly outstrips the left hand at the speed of development of kinesthesia.

In the third form, the difference between the degree of accuracy of the movements of the right and left hands is smoothed. The movements of the left hand become much more precise. The left hand begins to reach the level of development of to the right, but a certain distance between them still exists.

Sharply expressed asymmetry in the activities of the hands may act as an obstacle in the formation of labor motor skills. In the motor skills, necessary for crafts, both hands are included in the activity.

The insufficient development of the left hand's kinesthesia is an obstacle to the formation of working skills. The level of development of modern production requires the active participation of the left hand in labor operations. The sharp backlog of the left hand can be overcome during crafts lessons.

At technology lessons, a number of objective conditions affecting the nature of the interaction between hands and fingers and the visual-motor coordination can be noted.

One of these conditions is the working posture. Support of the working posture is ensured by stationary excitations of proprioceptors. The posture is the starting position for movement. Incorrect working posture causes a violation of the interaction of hands and visual-motor coordination.

In addition to the working posture on the nature of the interaction of hands affect the properties of the object of work itself. Properties such as magnitude, elasticity of the treated material, the location of the subject of work in the space affect the interaction of the hands.

So, paper cut is usually done in a hanging position, which is possible due to the elasticity of the paper. This position of the object of labor determines the peculiarities of the movements of hands and the posture of the worker. Cutting of tissue during cutting is carried out on the table, the movements of the hands and the working posture is the other than in the first case.

In the process of labor training develops analytical and synthetic activity of the motor analyzer. Especially important for the development of analytical and synthetic activity is the culture of kinesthesia, which determines the growth of motor skills and abilities of the child to muscular effort and to more complex labor operations.

The data from our study indicate that the work of the kinesthetic analyzer is manifested in the fractional analysis of movements in the operation of the hand with different materials and tools.

This analysis of movements extends to operations performed by each hand separately, on the differentiation of the motor functions of the fingers of each hand. Obviously, such an analysis is determined by the nature of the teacher's instructions about the rule of action (instruction of the action), the demonstration of an expedient movement, the control of the child's movements by the teacher and the correction of these movements.

At the beginning of children's teaching for labor activities there is no clear differentiation of the functions of fingers. Specialization of the functions of fingers – expression of the growing synthesis of movements.

Gradually the coordinate system of the hand develops. In the labor activity at first, not all fingers are active. First of all, forefingers and thumbs are included in work. The middle finger, and especially the fourth finger and the little finger, initially perform the balancing function. Later they start to play the role of support.

Analysis, dismemberment of each operation into separate movements contributes to the formation of a mode of movement that regulates labor activity.

The work of the kinesthetic analyzer is manifested not only in the analysis of movements, but also in synthesis.

With the development of synthetic activity, the nature of the analysis becomes gradually transformed, which becomes more and more delicate and urgent. This is expressed in increasing accuracy of individual movements and, especially in accelerating individual movements, as a result, the merging of movements into one holistic skill.

Synthesis is expressed in the establishment of the interaction between both hands, the interaction among fingers, the establishment of temporary connections between the motor and visual analyzer (visual-motor coordination).

Establishing of the interaction in the work of the hands and fingers, plasticity in the implementation of labor operations is an expression of the growing synthesis of movements.

Synthesis of movements is possible when a kinesthetic image of movement is formed, when separate parts of the labor operation are united into a single whole, when the end of the previous link entails the emergence of the next. The training of analysis and synthesis is the result of learning.

The analytical and synthetic activity of the motor analyzer develops in connection with the features of the processed material (texture, resistance to material, plasticity, etc.) and in connection with the nature of the manipulation of the tool.

Consequently, in the initial period of studying labor, the main methods should be analysis and synthesis, that is, the same methods that are the basis of teaching of other subjects in primary school But the peculiarity of these methods of teaching labor is determined by the laws of motor development of the child, the peculiarity of the formation of the system of motor skills.

For the labor activity and formation of readiness for it it is necessary to create strong visual-motor links that regulate motor activity. The question of visual-motor coordination is not only a question of the relation of vision and motion, but also about the visual-kinesthetic connections that affect movement.

Considering the question of the formation of visual-motor coordination, we can note the change in the ratio of visual and kinesthetic control of the work of the motor vehicle as the formation of labor skills.

In the first form, when children are only beginning to master labor operations, the movement of hands and fingers that perform labor operations is monitored, and, in addition, the quality of the work of the object of work is controlled. Thus, at first, two types of visual control of movements are carried out: direct, when the gaze fixes the movements of the hands and fingers, and indirect, when the visual signal that directs the movement of the hands, is the quality of material

processing: the accuracy of the lines, the ratio of sides and angles, the size, shape, position in space, that is, the change of spatial characteristics of the material being processed. The need of dual control complicates work, because it is difficult for children to distribute attention and they have to switch it. Their attention is focused on controlling the movements of the hands to hold the instrument and manipulating it, while weakening control over the quality of material processing, then control focuses on the quality of material processing and weakens the control of manipulation of the tool.

Gradually, the control of the movements of hands passes largely from sight to kinesthesia; visual control of movements is carried out, indirectly, through the quality of processing the object of labor. Indirect monitoring of movements is possible due to the establishment of temporary connections between the visual and motor analyzer.

As a result of the study, it was found that visual-motor coordination is largely determined by the visual field of students in the processing of the product. The quality of the product depends on the field of view. High quality can be provided only with the student's self-control during work. A visual assessment of the magnitude of the object, the ratio of its parts, direction lines is possible only if the entire developed object is in the field of view of the student. A sufficiently large range of vision can be when the eyes are at a considerable distance from the object, and this is possible only with the correct working position, when the student sits directly, without bending low to the object being processed.

The size of the range of vision depends, moreover, on the conditions of processing the object of labor. For example, when cutting with paper scissors, the range of vision is more when the contour is not drawn on paper and the student must cut by eye. In this case, a student faces a difficult task – visually assess distances. When cutting without a contour, the sight covers all or almost the entire sheet of paper, while cutting the strip in half without a scheduled line, the continuous matching of the width of the two striped strips is carried out. When cutting the same along the contour view is tied to the planned line, to a small area, which is now moving scissors. In these conditions, there is no need to evaluate visually the distance and the spatial relationship; the view is controlled only by the coincidence of the line of the cut with the contour.

The visual assessment of the spatial features of the object of work organizes and directs working movements of the hands, in some cases determines the pace of movement, the number of movements and their amplitude. In those cases when the student produces a visual product-evaluation, the movements of his hands while cutting are more free, broad, fast, more rational than when working in those conditions where vision is concentrated on a small plot. This can be seen by comparing cut-outs with the contour and without contours or cut-outs with a normal speed. When cutting without a contour at a normal pace, students perform more active activities that require greater autonomy.

Cutting without contour is much faster than when cutting with the contour. Cutting without contour in the first form is done 30 seconds faster than with the contour; in the second form – 16 seconds faster; in the third form – 13 seconds faster. The overall cutting speed both with contour and without contour increases from class to class. The cutting speed of the contour increases especially considerably, while the cutting time without contour changes relatively little.

A faster cutting-out without a contour can be explained by the fact that students in this case make a visual estimation. With a glance the distance is estimated much faster than it can be passed by hand with scissors. At the same time, the movement of the hand involuntarily accelerated. Some students at first with the end of scissors make an approximate line, and then cut out. If the tempo of cutting is slow, than the view is stayed in one place for a long time, attention begins to fluctuate, and the visual distance estimation becomes less accurate.

But although the tempo chosen by the students themselves when cutting without a contour and accelerated in comparison with the cutting with the contour, however, it is still insufficient. More successful cutting is performed in those cases when the tempo is determined by the experimenter, who gived the task to be cut as soon as possible, trying to execute the task accurately. The quality of the product in most cases is higher at a given pace than with normal. For example, the error in division without a contour of a strip into two equal parts is slower with a given tempo than in the ordinary one.

The lack of visual-spatial perception and visual-motor coordination is the cause of difficulties in teaching children (especially in the first form) in all educational subjects. At the same time, in the classes of subject-practical activity develops "sophisticated observation" (Rubinshtein, 1957).

Handmade skill develops in the process of processing various materials; the specificity of the subject allows providing a large variety of manual operations. The wider the range of operations that children take, the better and more diverse is the coordination of movements, the easier it is for the child to master with new activities. That is why the content of the subject is characterized by a variety of manual operations, such as cutting various types, trimming, twisting, assembly in a straight line and on the curve, bending, stripping, pulling and sliding (from clay), plaiting of different types, binding, stitching on cloths and etc.

Most often the main work is performed by the leading hand, while the other carries out auxiliary functions. But there are operations in which both hands perform the same movements (clogging along the drawn contour). Different operations are differently controlled by the brain cortex. To perform some operations, you need great precision (pull the thread into a needle, draw with a ruler, cut through the drawn contour), for other such accuracy it is not necessary to perform such other things (for example, to make bunches).

Different operations develop different psycho-physiological functions not to the same extent, but

attention is formed in any movements. In the process of work, children gain experience in organizing their own creative practice: orientation in the task, planning, forecasting, selection of optimal ways of activity, monitoring and correction of the results of actions. These actions are both objective and universal.

Psychophysiological functions involved in the process of manual labor allow us to formulate the goal of the subject – the general development of each child (mental, physical, spiritual, moral, aesthetic) by means of subject-practical activity.

Discussion

Considering the peculiarities of human movements in manual labor, Sechenov pointed out that the role of the regulator is vision and muscle-tangential feelings. As a result of the study, it was found that performing tasks in crafts requires a more flexible division of the functions of the hands. The right hand in these cases performs the main function, handles the object of work with the help of a tool. The left hand holds the material and takes it as it is treated. There is a series of objective conditions that influence the nature of the interaction of hands and fingers, visual and motor coordination of primary school students: the working environment, the properties of the object.

The analytical and synthetic activity of the motor analyzer develops in connection with the features of the processed material (texture, resistance to material, plasticity, etc.) and in connection with the nature of the manipulation of the tool.

In the initial period of teaching crafts, the basic methods should be analysis and synthesis, which are the basis for teaching other primary school subjects. The visual-motor coordination is largely determined by students' range of vision while processing of the product. The quality of the product depends on the range of vision. More often the main work is performed by the leading hand, while the other carries out auxiliary functions. But there are operations in which both hands perform identical movements.

Conclusions

Labor training as a process represents a holistic system characterized by continuity, dynamism. The subject "Technology" is part of the process of labor education and general education, which contributes to the formation of a system of labor knowledge, skills, development of psychophysiological qualities of the individual, education of positive attitude to work.

The work of children is also important for physical development: muscular activity, physical activity increases the functional activity of all systems of the child's organism; in the process of work, movements are improved, their co-ordination, consistency, arbitrariness. Handmade skill develops in the process of processing various materials, the specifics of the subject allows to provide a large variety of manual operations, such as: folding, twisting, folding according to a straight line and in curvature, bending, stripping, pulling and sliding (from clay), weaving of different kinds, stitching, stitching on fabric, etc. The wider the range of operations that children take, the better and more diverse the coordination of movements, the easier it is to master the child's new activities.

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Фізіологічний та психічний розвиток особистості молодшого школяра в процесі трудового навчання

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Анотація

Вступ: *У статті розглянуто проблему розвитку аналітико-синтетичної діяльності рухового аналізатора, формування зорово-моторної координації та загальний розвиток учнів початкової школи на уроках технології. Особливу увагу зосереджено на дослідженні поділу функцій правої й лівої руки молодших школярів при виконанні тих операцій, які вимагають застосування різноманітних інструментів.* ***Мета дослідження:*** *Перевірити ряд об'єктивних умов, що впливають на характер взаємодії рук, пальців і*

зорово-моторну координацію учнів початкової школи на уроках технології засобами предметно-практичної діяльності. ***Матеріал і Методи:*** *Для досягнення зазначеної мети використано загальнонаукові методи теоретичного рівня: аналіз наукової літератури з метою визначення ключових понять дослідження***,** *аналіз, синтез, порівняння; емпіричні – спостереження, фрагменти педагогічного експерименту; анкетування учителів початкових класів.* ***Результати:*** *Виконання завдань з праці вимагає більш гнучкого поділу функцій рук. Права рука в цих випадках виконує основну функцію, обробляє предмет праці за допомогою інструменту. Ліва рука тримає матеріал і переносить його в міру обробки. В результаті дослідження було визначено ряд об'єктивних умов, що впливають на характер взаємодії рук і пальців, зорово-моторну координацію учнів початкової школи: робоча поза, властивості самого об'єкта праці. Аналіз, розчленовування кожної операції на окремі рухи сприяє формуванню образу руху, що регулює трудову дію. Встановлення взаємодії в роботі рук і пальців, пластичність в здійсненні трудових операцій є вираженням зростаючого синтезу рухів. Тренування аналізу і вироблення синтезу є результатом навчання.* ***Висновки:*** *В початковий період навчання праці основними методами повинні бути аналіз і синтез, тобто ті ж методи, які покладені в основу навчання інших предметів початкової школи. Але своєрідність цих методів в навчанні праці визначається закономірностями рухового розвитку дитини, своєрідністю формування системи рухових навичок.*

Ключові слова: *уроки технології, рухові аналізатори, аналіз, синтез, учні початкової школи, зорово-моторна координація.*

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