

# Learning Space as a Prerequisite of Agency in Learning Activity

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The rapid pace of innovation and the increased quantity of information are affecting the traditional educational routes. Schools are now facing quite a new task: how to teach children to learn. The developmental learning approach of Elkonin and Davidov provides rich experience of solving this task. The paper describes a technology of learning space polarization that promotes learning autonomy in primary school and has been successfully applied in developmental learning classes. We explore the prerequisites of individual learning action formation, the action which is self-motivated, independent and responsible. We also describe three lines of learning autonomy development in students: result, research and product. The paper concludes with a description of the evolution of learning autonomy and its social/institutional forms and relates its stages to certain age periods in the child development.

**Keywords:** learning autonomy, learning space, individual learning action, developmental learning, training and inquiry-based lessons, modeling, sign tools, Elkonin, Davydov, agency, activity.

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## Образовательное пространство учебной деятельности как условие субъектности ее участников

**Островерх О.С.**

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Автор отмечает, что скорость инноваций и увеличивающийся поток информации изменили традиционную образовательную траекторию, и перед

школой возникла новая задача — научить учиться. В системе развивающего обучения Д.Б. Эльконина—В.В. Давыдова накоплен большой опыт по решению этой задачи. В данной работе описана технология поляризации образовательного пространства учебной деятельности, которая способствует становлению учебной самостоятельности младших школьников и успешно применяется в классах развивающего обучения. Показано, как с помощью особой организации пространства класса — поляризации на подготовку и реализацию — учитель может поддерживать и развивать учебную самостоятельность учеников начальной школы. Рассмотрены условия становления индивидуального учебного действия как действия инициативного, самостоятельного и ответственного; описаны три линии развития учебной самостоятельности: результативная, исследовательская, продуктивная; дана характеристика открытого педагогического действия. Описана эволюция учебной самостоятельности и социально-институциональных форм, соотнесены с возрастом этапы становления учебной самостоятельности.

**Ключевые слова:** учебная самостоятельность, образовательное пространство учебной деятельности, индивидуальное учебное действие, развивающее обучение, тренировочное и исследовательское занятие, моделирование, знаковые средства, Д.Б. Эльконин, В.В. Давыдов, субъектность, деятельность.

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## Introduction

The fundamental result of developmental learning in the Elkonin—Davydov system is the student's agency. In general terms, agency is a way of life in which an individual constructs (generates) forms of his or her own behavior, in the case of schools, his or her own learning experience [2; 10; 15; 16]. Education in all stages is seen as a progression of agency [1; 11; 12; 13; 17; 19; 25; 28].

The aim of education is to create the conditions for the emergence and development of learning skills. The interpsychic form of learning independence in schoolchildren has been studied most thoroughly in G.A. Tsukerman's research. The core of this form is the exploratory activity that oc-

curs in cooperative learning activities and is focused on discovering and trying out new ways of action [11].

Analysing the work of foreign researchers, we can note that the concept of personal initiative developed by Doris Fay and Michael Frese describes personal initiative as autonomous and proactive behaviour that aims to overcome obstacles to achieve goals. There are three aspects of personal initiative: self-starting, proactivity and perseverance. Self-starting means that a person does something without direct instructions and the aim of the initiative is to change oneself or the situation. Someone who shows personal initiative takes responsibility for an idea or project [20; 21; 23].

We believe that decision-making initiative as a vital aspect of independent action can occur at a very young age. The adult can participate in joint action with the child so that the child has the opportunity and necessity to make choices within the boundaries available at each age. [8; 9; 19; 22; 24; 25; 26; 27].

Currently, the issue of individual aspects of learning skills learn is not sufficiently elaborated in the theory and practice of developmental learning. This article is about the ways in which a specific educational space for learning activity created by the teacher promotes the establishment and development of learning autonomy in primary students. We will also explore: what are the symptoms and dynamics of learning autonomy in primary schoolchildren? What is the teacher's agency? What resources and means do teachers have for cultivating students' learning autonomy?

### **The individual learning action in primary school students**

Learning autonomy relates to the acceptance or rejection of "alien" tasks, to the emergence of one's own learning goals and implies that the student chooses or constructs the ways to achieve these goals. The independence is marked by the initiative to turn to another person. If any difficulties arise, the student is able to turn for help to the teacher, to a friend, to a book, etc. In learning the child can and should decide for himself or herself whether it is necessary to improve his or her learning skills. In other words, learning autonomy involves independent setting of individual learning goals, proactive search for the ways to achieve them, and responsible decision-making in a situation of choice [5; 7].

We consider the **individual learning action** as the first stage in the formation of learning autonomy as a personal development that first occurs in primary school age.

The **individual learning action** implies that the action is proactive and responsible.

The **initiative action** is an action of a child when he or she transforms the adult's task into his/her own rather than simply accepts it. In contrast to initiative in general, learning initiative is associated with the reformulation of the task.

The **responsible action** involves a certain amount of risk and decision-making. In order for a child to be able to make decisions meaningfully, he or she must understand when he or she is ready to do something and when he or she is not. The choice, in this sense, is a choice each time between "acting in a socially constructed way" or "not acting". If the teacher creates situations of choice for the child, then there's a space for children's initiative in making a decision.

The **learning action** is an action which is not about improving a person, his or her abilities, but rather about improving the very way of doing some activity.

Earlier in our works we have shown that the main way of constructing the individual learning action as an action of initiative, independent and responsible decision-making involves **dividing the children's actions into preparatory and executive**. If the teacher helps children to distinguish and switch between orientation and implementation from the very start, then the individual learning action emerges and develops as an action of initiative, autonomy and responsibility [1; 6].

### **The learning space as a factor for the development of learning autonomy**

In order to put children's search, trial and preparation at the center of the teacher's attention, the learning space needs to be organized in a special way.

S. Zaitsev in his research also indicates the need to create a varied educational environment that should stimulate students to perform learning activities independently and provide a choice of means and ways of accomplishing them [3].

In our case, the main method of teaching is the polarization of the learning space towards the preparation and implementation:

- the introduction of the draft and its construction as a particular place for preparation,
- special organization of the subject/ space environment,
- the introducing of lesson, class and polarized lesson as different forms for the organisation of learning time and learning activities.

When a teacher focuses on the development of learning autonomy in primary students, the object and subject of the teacher's work change. **The object of teaching action** is the structure of children's action in terms of the two functions existing in one action and often merged: preparation (orientation) and implementation (execution). The teacher arranges the learning space in a way that enables the student to prepare for any action in a given class, in other words, to construct a way of solving a group of tasks. From the beginning, this task space should act as a preparation space where the child builds his or her own experience of the activity.

The central position in the developmental learning system is the nature of a scientific concept. As V. Davydov pointed out, mastering a concept means knowing how to construct this concept, and tools and signs form the main content of the orientational basis of an action [2].

The teacher's action is more related to the initiation of the students' orienting and, more broadly, preparatory actions. Learning to make drafts does not involve handing over ready-made tools, but is linked to the organization of students' reflective attitude towards their work — their understanding of the relevance of their preparation.

*To understand means to learn* — according to D.B. Elkonin, it does not necessarily mean to understand, but to train and to improve yourself in what you are not good at, to work with yourself on some task [16].

Rethinking becomes the focus of communication between the child and adult in the work with the draft. First, the teacher starts to see the child's work as a "draft", giving significance to the child's action as a trial, and then the child rethinks his or her own work in this way [5,6,7]. For example, a first-grader takes a dictation in Russian at the end of first grade. The student writes the whole dictation, then checks the work, finds the misspelled word and circles it. The observer: "*Why did you highlight that word?*" Student: "*It's a dictation. I'll practice with the wrong words at home*". In this example you can see how the girl plans her future work in advance. Self-work is seen both as performance (writing dictation) and as preparation for future action (highlighting words with mistakes).

In our view, when a child gives meaning to his work as the one which can be continued, s/he builds a coherence of preparation and implementation, i.e. an individual learning action.

The distinctions and transitions between the two functional parts of an action — between orientation, preparation in the broad sense and realization — become **the subject of the teacher's observation and work**. The teacher considers not only how the child has mastered the content of the lesson, but also how he or she organises the preparation, whether he or she is proactive in using the resources, how he or she acts in a situation of difficulty, at what point he or she decides to end the preparation. Teachers' action becomes transparent when it turns into *children's action*, which is independent rather than imitating an adult's model [14].

Here we are talking about constructing teaching activities that reveal to the child the meaning of his or her action and provide, an understanding of how to transform his or her way of doing things. This transformation has a proactive and responsible form of behavior. Initiative, responsibility and learning are

generated as an educational outcome and cannot be shaped directly.

**The individual features** in the forms of training can already be observed by the middle of the first grade, which is one of *the symptoms of the occurrence of the individual learning action* [7].

Another symptom of the distinction between preparation and implementation actually taking place is the appearance of children's words reflecting the meaning of the action. The child's emphasis on the special validity of the draft, when the pupil circles a part of the work in his or her notebook and signs it "do not evaluate", is an indicator of how the child distinguishes and connects the two parts of the work.

We differentiate between two types of child behavior. One is the construction of the "draft" itself, when the child's action is built up within the limits of using the means suggested by the teacher. And the second is the child's own work in constructing the tool.

The psychological sense of this work is that the child is trying to determine the functional meaning. By contrasting *the tool and the task* in object terms (the table with "helpers" and the "assessment table"), we have observed that for the child a distinction between the tool and the task is not given. In the first grade it is confusing for the child: when he or she takes a "helper", the latter is treated not as a tool, but as a task. In the second grade, when children actually engage in making "helpers", the student is confused on another level: by saying that he or she is making someone a tool, he or she is in fact writing a task. By the end of the second grade, the child is able to differentiate the task from the tool. In the third grade, we encounter cases where the child takes the initiative to continue his or her action. For example, in the third grade, after a lesson on creating "helpers", Yulia Z. asked the teacher: "*Let me give Katya my helper, whether it can help her or not,*" and then watched Katya use her helper while she worked.

Searching for one's place of action is the initiative that in some children appears at the end of the second grade, but for the most part it appears in the third grade as the teacher unfolds the work of creating children's helpers.

Thus, ***the evolution of children's learning autonomy*** is reflected in the ability of students to determine the extent, place and content of their own training, which means that individual forms of training appear. The majority of children begin to construct an action to improve their work by addressing the table with helpers, differentiate the two parts of the work in content and scope, and proactively explore and comprehend the function of the tool, which are ***important indicators of the cultivation of an individual learning action.***

In order to highlight preparation as a special work space, the teacher sets up two semantic centers in the classroom, preparation and implementation, which differ not only in content, but also in ***the object-space form in which they are organized.*** Each child has their own small whiteboard, there are also several small boards in the classroom which represent practice and test areas, and the large board acts as a place for presenting the results. The class has a helper table, a practice table with tasks of different levels of difficulty and a separate table with quizzes.

The emphasis on special 'places' in the classroom reinforces the opposition between the preparation and the result. Blackboards, tables with different functional meanings act as a support for students' organization of their own action, which is constructed as a transition from one type of work to another (from preparation to realization and vice versa). The visually presented tools (objects, diagrams, models) on the table with "helpers" create a situation of choice for the child. The child can choose any tool from the variety and test it, which reinforces the content of the preparation itself.

The transition from preparation to implementation is accompanied by another polarization of socio-institutional forms of organization. The teaching time in primary school is divided into “lessons” and “classes”, differing in the type of communication between the teacher and students, in the form of completion, and in the content of the subject material.

The type of cooperation between the teacher and the children changes in the class. The teacher in a consultant position observes the individual learning action of the child: how does he or she prepare the action, does he or she turn to helpers, does he or she check the completed cards, how does he or she decide to move on to assessment. The teacher helps to focus the child’s attention by asking: “How did you know that this particular card should be done?” or “How did you know that you have had enough practice and it is time to move on to assessment work?”

Thus, by dividing the child’s actions into preparation and implementation, the teacher assigns a specific meaning to the tool as an orientation tool right from the beginning. The teacher is engaged in constructing situations of choice so that the child can make meaningful decisions, knowing when he or she is ready to do something and when he or she is not.

Three lines of development of learning autonomy can be pointed out in learning activities: effective, exploratory, and productive (as the creation of tools for theoretical thinking). These lines are based on the theory of learning activity, where there are two emphases in the learning task:

- 1) Discovering and modelling a general method;
- 2) Applying the general method to solve a class of practical problems.

Essentially, these two accents in the theory of learning activity and in its practice do not follow naturally from one another. As B. Elkonin writes: “*The learning task im-*

*plies a transition from direct trial and error in achieving a result to a special construction (together with the teacher and other children) of a scaffolding of a possible action (its orientational framework). Only in this transition-overcoming does the possible action itself, not just the required result, become an object of consideration, i.e. the action is re-evaluated, re-conceptualised. This is the intrigue of the learning task, and to the extent that this intrigue engages the student and is felt by him or her, the student transforms his or her own experience, i.e. proceeds to actually work with his or her own experience—that is, to learn” [15, p. 30].*

The two accents of the learning task were the basis for dividing the lessons into **training** and **inquiry-based** ones.

If the training lesson is aimed at teaching children how to evaluate their work, how to choose the means of overcoming deficiencies and how to work on the operational structure of the ways of action, the inquiry-based lessons unfold a child’s trial of signification as a tool for understanding mathematical and linguistic relations. The result is the creation of a model for analyzing and describing significant relationships.

On the transition from the individual learning activity of solving concrete practical tasks to the individual learning-research activity as a trial-and-error activity, another subject of the teacher’s work appears: proactive mediation by the child. The act of mediation is subjected to a test, for example, by playing with the mathematical relations constructor, children explore limits in composing word problems (e.g. how many tasks can be compiled without extra data).

During lessons students analyze and understand essential relationships by testing, inventing model tools — diagrams, devices, dynamic models, etc. The importance of using different signs at the same time — drawings, diagrams, tables — provides new opportunities for students to explore how transforming a mathematical relationship

in one action plan (the diagram) leads to a change in another action plan (the text of the problem). In contrast to a productive activity, the learning and inquiry-based activity may not be completed, because the children are involved in playing with the sign language (“what if I put the arrows in the construction set like this?”).

The main point about the trial action is **the recurrence** of the child’s own, original action, where the child thinks up a task scheme, addresses it to someone else and, after trying it out, comes back and reconstructs it. This recurrence is an indicator of overcoming the executive action in the trial.

Thus, an individual learning action on the result line is represented as a relationship between orientation and realization, where the orientation is built by the child to overcome his or her own deficits, the operational structure of the way of action is practiced, and the realization is a solution to a problem.

In an individual learning activity on the theoretical line, the orientation takes on a completely different characteristic and unfolds in the trial of signification as a tool for understanding the structure of the task. The result is the creation of a model in which the student describes the essential connections and relationships he or she has identified. Learning and research activities are developed along the lines of modelling, which develops intensively in the third and fourth grades on the basis of textual tasks.

### **Dynamics of the individual learning action**

We suggested that the second phase of primary school age is characterized by significant changes in the development of learning autonomy, with students in third grade progressing to high levels of individual learning activities (hereafter referred to as ILE). The theoretical basis for this assumption was D. Elkonin’s idea about the two phases of primary school age, when from

the first to the second phase there is a transition from collaborative to individual learning activities [16]. To explore the dynamics of ILE formation on the result line of learning independence, we conducted a diagnostic procedure “Preparing for test” [5; 6]. The procedure was carried out over the period of four years with students from three experimental developmental classes in which the technology of polarization of learning space was implemented.

The purpose of the observation was to determine how the child links preparation to implementation in his or her work. The following **observation criteria** were chosen to assess the student’s individual learning action: 1) choice of the type of work, reasons for choice; 2) adequacy of preparation (consistency between preparation and evaluation); 3) performance of work; 4) content of preparation: choice of practice cards in relation to own difficulties (or just easy, interesting, not difficult), independently or with help; 5) turning to the teacher; 6) turning to the tools; 7) transitions from preparation to performance and from evaluation to preparation.

The first, second, third and fourth criteria are related to goal-setting, focusing the goal of the action and achieving the result (independent action). The fifth and sixth reflect children’s initiative as a search for tools. The seventh criterion is related to putting the action on hold and deciding whether to switch to assessment or to practice again (responsibility).

During the lesson the teacher announced the option of either doing the quiz straight away or practising beforehand. The students were able to decide for themselves where to start work, at what point to move from the practice to the quiz, and what tools to use in preparation.

On the basis of the given observation criteria, five levels of individual learning action in students have been identified. A child with a high level of Individual Learn-

ing Action is able to assess him or herself in relation to the skills to be tested in the quiz. On this basis the student decides whether or not he or she will be able to cope with the quiz. And then, either proceeds to the assessment work or chooses preparation. When choosing preparation, the students demonstrate ways of overcoming their own difficulties: they ask the teacher and their classmates meaningful questions; they turn to the keys or to the teacher to check the practice tasks; use “help cards” which allow them to achieve higher performance levels in their quizzes. During the lesson, the student independently decides when to finish his or her preparation and move on to the quiz.

The table presents data on the dynamics of the individual learning activities in primary school children from the first to the fourth grade.

The table shows that the transition from the first to the second grade is characterized by a decrease in the number of students in the low- and below-average groups; from the second to the third grade there is a different trend: the number of students in the high-level group increases (by 16%). From the third to the fourth grade, the group of children with above-average levels increases significantly (by 18%).

Here’s a brief description of the qualitative changes in ILE that were observed in the experimental classes.

Firstly, the content of the training has changed significantly: the students were already able to justify their choice of work in detail and link it to the self-assessment of the skills, highlighting their own difficulties. At the beginning of the second grade, only four students associated their choice of work with the tested skills, whereas at the end of the third grade 87% (73 students) could do so, and at the end of the fourth grade 99% (75 students).

Secondly, we noticed a proactive approach of the students to checking their own work. Self-checking became internally necessary in the organisation of their own preparation and was done without the request of the teacher. By the end of the third and fourth grades, checking practice cards against the keys had become the norm in preparation for quizzes;

Thirdly, by the end of third grade, there was a group of students who had a work plan to guide their preparation for the quiz (14 out of 84 students).

Thus, quantitative and qualitative analysis of the data from a four-year experimental study showed that from the second to the third grade there was an increase in the number of students with high and above average levels of individual learning action, which supports our assumption about the dynamics of students’ individual learning action in the transition from the first to the second phase of primary school age.

Table

### Dynamics of the individual learning action of primary students

ILE level	1 grade 64 students — 100%	2nd grade 84 students — 100%	3d grade students — 100%	4 <sup>th</sup> grade 76 students — 100%
Low	11	6	1	1
Below average	9	5	6	7
Average	69	74	62	46
Above average	9	6	<b>6</b>	<b>24*</b>
High	2	<b>9</b>	<b>25*</b>	22

Differences between classes were statistically significant using the  $\chi^2$  test: \* at  $P < 0.05$ .



## Conclusion

The presented experimental data have shown that the polarization of the learning space is a prerequisite for the creation and development of learning autonomy in primary school students. It is important to emphasize that the dynamics of learning autonomy only occurs if **several subject areas evolve**. *Firstly*, the evolution of the subject tools and their spatial organization. *Secondly*, the evolution of the tool application situations: learning/theoretical and learning/productive, practical. *Thirdly*, the evolution of the socio-institutional forms.

Thus, the evolution of the activity/lesson relationship is characterized not only by the appearance of first practice lessons in the first grade and then of productive and inquiry-based lessons in the second grade, but also by the appearance of the polarized lesson in the third grade, when children engage in different activities within the polarized lesson according to their interests: some make abaci — (tools for theoretical thinking), some transform different models, others practice their skills. Inside the lesson, there is a situation of choice and a free learning space within the work, where children finish with one thing and then move on to another place to do another. And in the third grade, there is a competition of investigative and productive ways for the students themselves.

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Evolution proceeds in two directions:

- change of the leading form specific to each stage of training,
- the emergence of new auxiliary tools (constructors, flashcards), which, on the one hand, is the separation of the teacher with his/her theoretical thinking from the child, on the other hand, the separation of the child from the teacher and the appearance of the child's action as initiative, independent and responsible.

The emergence of varied forms of work: a training session — work on mistakes and skills; an inquiry-based lesson connected with constructing things, models; individual homework which the child makes for himself; independent study of a new topic indicates that the variety of forms and their evolution quantitatively and qualitatively changes the lives of the children and the teacher.

The child's achievements in learning independence is a signal for the teacher to “remove” himself from what the child has mastered and can do now on his own. If the child can organize his/her training to overcome his/her deficits, the teacher creates the zone of proximal development for his or her learning autonomy (individual homework, independent study of a new topic, etc.). Only in this case does **the history** of the child-adult actions as *forms of agency of the child and the teacher* appear.

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