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**THE PECULIARITIES OF THE AGENCY OF
SCHOOLCHILDREN OF 7-8 AND 8-10 CLASSES**

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Abstract

The article presents the results of an empiric research, organized to substantiate the use of an ecopsychological model of step-by-step agency development in students of different ages as subjects of learning activity.

The obtained empirical data demonstrate that each stage of agency formation is characterized by relationships between learning activity and regulatory universal learning actions.

Analysis of the dominant variables in the stage 7-8 of the class indicates that the learning process is not focused on the formation of the subject's qualities of the student.

The revealed parameter structures, characterizing samples of different ages, have significant differences. These parameters indicate that with the increase in age there is a shift from reproductive forms of learning to productive ones. Generally, we can observe gradual transition from executive to regulative variables in correspondence with the stages of the ecopsychological model. Thus, the ecopsychological model may serve as a psychodidactic basis for development of agent qualities that contribute to successful formation of universal learning actions and to achievement of meta-subject results in education.

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Keywords: Educational activity, universal learning actions, agency formation, stages, ecopsychological model, schoolchildren.



1. Introduction

Modern educational practice is characterized by the change of the didactic paradigm to the psychodactic one (Davydov, 1996; Panov, 2007, etc.), within the framework of which learners' agent qualities become the aim of education. The need for the emergence of the psychodactic paradigm is based on the fact that traditional teaching technologies are to develop the learners using the principle of increment of new knowledge and skills, actualizing the reproductive activity of learner's consciousness (perception of learning material – reproduction of learning material). Therefore, the creative nature of mental development turns to be beyond the teaching technology (its content and methods). The reason for this has methodological nature. With such an approach, teaching technologies reproduce the logic and the content of the corresponding scientific field, rather than the inherent logic of mental development according to its nature (Panov, 2007; Panov & Plaksina, 2017). The system-activity approach acts as a scientific substantiation of new content and methods of educational activity within the framework of the competence paradigm. This approach is the integration of the main principles of cultural-historical, activity, developing, personality-oriented approaches to the use of learning as a factor and condition for the development of universal learning actions as educational results. In accordance with the modern requirements, not only subject, but also universal learning actions (hereinafter ULAs) are considered to be the results of school education (Asmolov et al., 2011).

According to the system-activity approach, the ULAs include personal, regulative, cognitive and communicative actions. For example, personal ULAs include self-determination, meaning-making and ethical appraisal; communicative activities imply the ability to listen and to enter into a dialogue, participate in discussion of problems, integrate into a group of peers and build efficient interaction and cooperation with peers and adults. Regulative ULAs are the most significant in relation to the educational process. They help students to organize their learning activities on their own (Asmolov et al., 2011). The list of regulative ULAs includes: targeting as the setting of academic pursuits based on the correspondence between what is already known, and what is still unknown; planning as determining of sub-goals in order to achieve the final result; making up a plan and a sequence of actions; prognosing as the outcome and achievement anticipation, control by comparison of the way of action and its result with the given standard; correction as making necessary additions to the plan and the way of action; appraisal as awareness of the quality and the level of learning; will self-regulation as the capacity-building and energy-building ability to overcome obstacles.

2. Problem Statement

It has not been completely specified yet how the pedagogue should develop the agent qualities necessary for mastering meta-subject skills. In the methodological recommendations for the achievement of the educational purpose, mutual learning activity is distinguished as a meaningful motivating basis. This is the basis for formation of conscious self-regulation and learner's agency. The difficulties in realizing the values and the goals of the system-activity approach are obvious:

- learner's agency formation is based on the academic subject content, which has its own logic of the academic discipline development, and may not correspond to the logic of agency formation and development;

- pedagogues do not have enough knowledge of the logic and the stages of the formation of the learning activity agent. There is a lack of recommendations that it is necessary to proceed from the common regularities of the age development while universal learning actions are forming;
- pedagogues do not understand and apperceive well the psychological essence of pedagogical technologies, which are based on the collective distributed activities. Because of this, mutual activity does not serve as a meaningful motivating basis, and the formation of learner's ability to be a learning activity agent occurs spontaneously.

3. Research Questions

To form learner's agency purposefully, it is necessary to use a psychological model of agent qualities that are necessary for learners to become learning activity agents, as a starting point for building learning technologies.

Ecopsychological (ecopsychological) model of agency formation is considered as a model of purposeful development of agent qualities. This model is invariant with regard to the subject content of the academic discipline. Thus, this model can be the psychodidactic basis for elaboration and approbation of learning technologies. These learning technologies are aimed to the purposeful development of learners' and pedagogues' agent qualities necessary for obtaining meta-subject results, if this model is applied in general and higher education.

In accordance with the ecopsychological (ecopsychological) model, the formation of agent qualities is implemented step-by-step (Panov, 2014; Panov & Plaksina, 2016, 2017):

1. The subject of motivation who wants to master a new learning activity (activity pattern);
2. The subject of perception (Observer) who is able not only to consider the activity pattern, but also to form "in the mind" the model (image) of the activity pattern;
3. The subject of copying action (Apprentice) who is able to reproduce the activity pattern after the pedagogue;
4. The subject of the arbitrary fulfillment of the activity pattern, still relying upon the pedagogue's external control (Learner);
5. The subject of the arbitrary fulfillment of the action, relying upon the internal control (Master), who is able to fulfil the activity pattern on his/her own, including control and correction;
6. The subject of the external control over the activity pattern fulfilled by others (Expert) who is able to notice errors in the activity pattern as it is fulfilled by others;
7. The subject of productive development (Creator) who is able to use the mastered activity pattern as a subjective means for his/her own further development, including creative self-expression.

4. Purpose of the Study

The indicators characterizing the learning activity at each stage have been chosen for the experimental verification of the theoretically based stages. For this purpose, we have used the conception by A. A. Volochkov (Volochkov, 2007). He considers learning activity as a qualitative-quantitative measure of interaction between the subject of educational activity and the educational environment (pedagogue, requirements, educational activity content). The criteria of subject's learning activity,

identified by A.A. Volochkov, are similar in content to the agent qualities typical for the stages of agency formation in the ecopsychological model described above. This allows us to use these criteria for the empirical evaluation.

5. Research Methods

As a diagnostic tool we have chosen the SLA (Students' Learning Activity) questionnaire for students, developed by A.A. Volochkov. It allows to appraise 11 parameters of learning activity: learning self-assessment (LSA); dynamics of learning activity modification in combination with the internal cognitive motivation (DMod); retention of the ability to act after a failure in the course of learning activity (CAf); learning motivation (LM); supervision of the implementation of educational activity (SAi); activity under external control (ACf); level of reproductive dynamics of educational activity (Drep); resulting component of learning activity, both external and internal (LAres); learning activity potential (LApot integral scale); regulative component (LAreg integral scale); overall dynamics of learning activity (LAdyn integral scale); and LA total scale as the indicator of internally aroused, independently initiated student's activity in the process of learning (Plaksina, 2016).

For the diagnosis of the regulative ULA, we have used the questionnaire of activity self-organization (QAS) by E. Yu. Mandrikova (2010). Its scales allow to appraise the agent qualities responsible for learning activity organization: conformity to plan as the level of involvement in tactical planning; aim consistency as the ability to set the aim and concentrate on it; persistence as the disposition to conation in order to correct the activity to obtain the result; fixation on activity strutralization as the ability to maintain the sequence of actions; self-organization as the tendency to order the elements of environment in order to achieve the aim, focus on the present.

Viability test by D. A. Leontiev and E. I. Rasskazova is used for the sample of classes 9–10 students (measuring scales: involvement, control, risk acceptance, viability). D.A. Leontiev points out that viability is a characteristic of activity that turns obstacles into advantages and developmental conditions. Deep involvement indicates satisfaction with one's own activity. High level of control features freedom of activity choice and responsibility for the choice, and risk acceptance characterizes the conviction that everything that happens is personal experience fostering development (Personality potential..., 2011). In our opinion, in the ecopsychological model deep involvement characterizes the stage of subject of motivation, whereas control and risk acceptance characterize the stage of creator.

We assumed that each stage of the ecopsychological model corresponded to a certain parameter of learning activity, interconnected with self-organization and viability characteristics. Table 1 presents the stages of formation of learning activity agent and the learning activity parameters corresponding to each stage.

Table 01. Correspondence between the stages of formation of learning activity agent and the learning activity parameters

№	Agency formation stage (ecopsychological model)	Learning Activity Parameter (according to A. A. Volochkov)
1	Subject of motivation	Learning motivation (LM); Involvement
2	Subject of perception (Observer)	Learning activity potential (LApot); Self-organization (QSA)
3	Subject of copying activity (Apprentice)	Level of reproductive dynamics of educational activity (Drep); Persistence (QSA);
4	Subject of planning and voluntary fulfillment of the action, relying on the external control (Learner)	Regulative potential (LAreg); Activities under external control (ACf); Aim consistency (QSA) Activity Structuralization (QSA)
5	Subject of planning and arbitrary fulfillment of the action, relying on internal control (Master)	Internally aroused, consistent activity (LA) Conformity to plan (QSA); Control
6	Subject of external control over the activity-pattern fulfilled by others (Expert)	Supervision of the implementation of educational activity (SAi) Self-organization (QSA)
7	Subject of productive development (Creator)	Learning activity modification dynamics (Dmod) Viability; Risk acceptance

In order to process the empirical data obtained in the samples of classes 7–10, we have used statistical methods: check of the results for coincidence with the normal distribution; verification of differences in the intensity of the studied parameters (Mann–Whitney U-test); Spearman’s rank-order correlation (r -Spearman, $r_{crit} 0.005 \approx 0.332$); method of rank analysis by the maximum correlation, by the sum of significant correlations, by the number of correlations, and the average rankings of variables according to their contribution to the correlation relationships.

6. Findings

Tables 2 and 3 show the averaged results in different test groups.

Table 02. The intensity of educational activity rates in samples of different age

Classes	LSA	Dmod	ACf	LM	SAi	Drep	LAres	LApot	LAreg	LAdyn	LA
7-8	29,90	26,35	31,00	34,90	28,49	32,58	30,60	32,56	29,67	29,84	31,43
9-10	31,49	26,64	31,70	36,42	29,11	32,08	29,56	33,92	30,38	29,29	30,65

Table 03. The intensity of parameters characterizing the self-organization of activity in samples of different ages

Form	Conformity to plan	Aim consistency	Persistence	Activity structuralization	Self-organization	Orientation to the present
7-8	13,95	31,78	20,46	19,64	7,78	8,53
9-10	16,64	34,22	21,76	20,14	7,87	9,20

Significant differences (at $p \geq 0,05$) have been obtained in the parameters of learning self-assessment (LSA), learning motivation (LM), conformity to plan and aim consistency. It's very important to note that in the sample of classes 9–10 students there is a tendency to increase of the numerical indices characterizing the development level of the test parameters.

Correlation analysis has revealed interrelations of learning activity parameters and characteristics of viability and self-organization. The results are shown in Table 4.

Table 04. Interrelation of learning activity parameters and characteristics of viability and self-organization (r -Spearman, $r_{crit} 0.005 \approx 0.332$)

Stage	Learning activity parameters	Self-organization characteristics	
		Classes 7–8 forms	Classes 9–10 forms
Mot	LM (learning motivation)	Conformity to plan, $r=0,35$	Aim consistency $r=0,30$
		Aim consistency $r=0,35$	Activity structuralization $r=0,29$
		Self-organization $r=0,32$	Involvement $r=0,30$
O	Learning activity potential (LApot)	Conformity to plan $r=0,286$	Involvement $r=0,25$
		Persistence $r=0,281$	Control $r=0,28$
A	Level of reproductive dynamics of educational activity (Drep)	Conformity to plan $r=0,31$	Activity structuralization $r=0,31$
		Aim consistency $r=0,41$	
		Activity structuralization $r=0,28$	
L	LAreg (regulative potential)	Persistence $r=0, 34$	Control $r=0,39$
			Involvement $r=0,36$
	Activity under external control (ACf)	Activity structuralization $r= -0,305$	Viability $r=0,45$
		Persistence $r=0,42$	Activity structuralization $r= -0,31$
M	Internally aroused, consistent activity (LA)		Persistence $r=0,42$
			Control $r=0,35$
			Viability $r=0,28$
E	Supervision of the action of educational activity (SAi)	Conformity to plan $r=0,34$	Persistence $r=0,35$
		Persistence $r=0,33$	Activity structuralization $r=0,28$
			Control $r=0,30$
			Involvement $r=0,25$
		Viability $r=0,31$	
C	Learning activity modification dynamics (Dmod)	Conformity to plan $r=0,31$	Activity structuralization $r=0,24$
		Aim consistency $r=0,32$	Self-organization $r=0,21$
		Persistence $r=0,33$	Control $r=0,27$
		Activity structuralization $r=0,30$	Viability $r=0,21$
		Self-organization $r=0,35$	

6.1. The discussion of the results

In order to process the obtained empirical data, we have calculated the ranks by the maximum correlation, by the sum of significant correlations, by the number of correlations, and the average rankings of variables according to their contribution to the correlation relationships (Table 5). Further we present only the differences in the structure of the variables characterizing agency in the samples of different ages.

Table 05. Average ranking places of the variables in correlation tables in samples of different age

Variable	Ranking place in the structure of the variables	
	Classes 7–8	Classes 9–10
Dominant variables		
Learning activity dynamics (LAdyn)	1	3
Level of reproductive dynamics of learning activity (Drep)	2	
Learning activity potential (LApot)	3	
Learning motivation (LM)	4	
Viability (activity as a factor of development)		1
Control as one’s own responsibility for results		2
Action implementation control: persistence, aim consistency (SAi)		4
Secondary variables		
Learning self-assessment (LSA)	5	12
Learning activity modification dynamics (Dmod)	6	10
Retention of the ability to act after a failure (ACf)	13	8
Learning motivation (LM)	4	13
Action implementation control: persistence, aim consistency (SAi)	7	
Learning activity potential (LApot)		9
Resultative component, learning self-assessment (LAres)	15	16
Level of reproductive dynamics of learning activity (Drep)		6
Regulative component (LAreg)	8	6
LA (integral indicator characterizing the agent’s self-initiated activity in education)	14	5
Conformity to plan	9	16
Aim consistency	11	18
Persistence	12	15
Focus on the activity structuralization	9	11
Self-organization	16	19
Orientation to the present	17	19
Involvement	-	14
Risk acceptance	-	21

In the classes 7–8 sample, the dominant features are LAdyn (the dynamics of actualization, reproduction and deployment of educational activity) and the associated Drep (intensity, rate, desire to work with total efficiency), and LApot, which expresses the individual characteristics of learning motivation (I want to learn) and learnability (I can learn) correlation, as well as willingness to implement all the structural components of learning activity. Therefore, we can conclude that the shift from arbitrary actions under external control to voluntary actions under internal control takes place at this stage of education.

The analysis of the classes 9–10 students’ results has revealed the structure of variables similar to the previous one. LAdyn (the dynamics of actualization, reproduction and deployment of educational activity) serves as a dominant feature. The calculation of variables’ average rankings in the correlation table according to their contribution to correlations has shown that the first places are taken by “viability” (activity that turns obstacles into means of development), “control” (freedom of choosing activities), SAi (educational activities implementation control, will activity, persistence), Drep (intensity, learning rate, desire to work with total efficiency) and LAdyn. Thus, it can be affirmed that the educational stage of

classes 9–10 can be characterized as a stage when the regulatory components of learning activity begin to prevail, and the ability to free choice and conscious regulation of one's own activity emerge. All this can be considered as the characteristics of the last two stages of agency formation.

7. Conclusion

1. Each stage of agency formation is featured by correlation between learning activity characteristics and parameters characterizing regulatory ULA. Correlations revealed at each stage of agency formation confirm the psychodidactical paradigm statement that consistent development of learner's agent qualities in accordance with the stages of the ecopsychological model will result in the regulatory ULA managing learning activity. At the same time, the content of the academic subject should be used by the pedagogue as a means of development of universal learning activities corresponding to each stage of agency formation.

2. The interrelation of learning motivation and the characteristics of activity organization corroborates the statement that the subject of motivation for learning activity has internal regulatory qualities aimed at maintaining the learning goal and planning its achievement. Correlation analysis (r-Spearman, $r_{crit}0.005 \approx 0.332$) revealed reliable interrelation of the LM (learning motivation) parameters, conformity to plan ($r = 0.35$), aim consistency ($r = 0.35$) and self-organization ($r = 0.32$).

3. The absence of correlation at the stage of transition to arbitrary implementation of action with reliance on internal control (Master stage) in the classes 7–8 sample characterizes a typical educational situation: due to the patterns of age development and to the change of leading activity, the motivation of learners at this age is reduced. The results of the research show that learning motivation of the classes 7–8 sample is lower at the 5% level of reliability in comparison with the results of classes 9–10. Pedagogues intensify pedagogical pressure, use reproductive methods of teaching. Thus, they return learners to the stages of development they have already passed, delaying the development of universal learning skills, typical for the master stage.

4. The revealed differences in the intensity of parameters characterizing the stages of agency development in favor of classes 9–10 evidence that the formation of the educational activity agent “lags” and does not occur in accordance with the leading activity. Self-consciousness that actively develops in teenagers and adolescents in classes 9–10 contributes to building life projects, increasing learning motivation and accepting educational situation as a source of development. It should be noted that the formation of the learning activity agent has its own sensitive period from 7 to 12-14 years.

5. The analysis of dominant variables structure at the stage of classes 7–8 indicates that the learning process is not focused on the formation of learner's agent qualities. Thus, the overall level of learning activity dynamics LAdyn is a dominant feature determining the development of learning motivation as well as the willingness to implement all the components of learning activity (LApot) and regulatory ULA. This characteristic shows itself in the desire to work with total efficiency and creative success in educational activity. However, this desire “drowns” in the routine of reproductive educational activities, reducing the learning motivation. In general, the obtained data imply that the formation of learning activity agent is rather spontaneous, and doesn't take into consideration the regularities of this process and even the patterns of age development.

6. The structure of parameters characterizing a certain stage of agency formation has significant differences in the samples of different ages (the same parameters get different ranks in the correlation tables). In the change of structures we can see a shift from executive variables to regulative ones which characterize the following stages. This means that with the increase of the learners' age there is a shift from reproductive forms of educational activity to productive (creative) one.

Thus, the ecopsychological model of agency formation can be a psychodidactic basis for the appraisal of agent qualities development. These qualities ensure successful formation of universal educational actions and achievement of meta-subject results in school education. According to this model, learner's agency development has to pass through several stages, when each preceding stage acts as a condition and a subjective means of mastering the subsequent one. In order to create conditions for the implementation of each of the stages of learner's agency development, the pedagogue should know these stages and create the corresponding educational situations.

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