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**DIAGNOSIS OF STAGES OF AGENCY FORMATION**

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***Abstract***

The necessity of the formation of graduates of the active life and professional position, independence in self-determination is closely connected with to the development of their agency. In this article the development of agency is considered on the basis of ecopsychological approach to the development of the psyche (Panov, 2014a). The author's description of the stages of agency formation "Observer", "Apprentice", "Learner", "Master", "Expert", "Creator" is given in detail. Attention is drawn to the fact that the formation of agency in this case is represented in the unity of instrumental (Executive) and regulatory components (components of planning, control and correction of activity), which is reflected in the diagnostic constructs in the development of self-assessment methodology of the stages of formation of agency in educational activities. The article presents the results of the study on students of university in Samara.

Comparative analysis of the results showed that the developed method is sensitive to the features of the sampling. In general differences of the self-assessment of the formation of agency stages are obtained. The most formed stages are the stage of "Creator" and "Master" among all students. The regulatory component of control is the least developed among all students, which emphasizes the importance of training on the skills of regulation.

Psychometric research methods (reliability, design and criteria validity) showed acceptable results, allowing to recommend it for research purposes.

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**Keywords:** Agency, stages of formation, self-assessment, diagnosis, ecopsychological approach, student.



## 1. Introduction

In recent decades, the interest of psychologists and teachers to the problem of subject and agency has increased dramatically. This is due to the fact that in modern post – industrial society, a person is an active subject, freely disposing of own capital personal skills. Nowadays such requirements for a person as independence, determination, responsibility for the decision, the ability to learn and retrain come out on top. This creates the need for the formation of young people's active life and professional position, culture of interpersonal relations, self-education skills, self-realization. These qualities are associated with the phenomenon of agency (Panov, 2014a; Panov & Plaksina, 2017a, b).

## 2. Problem Statement

The problem of formation of agency becomes particularly relevant in the educational system, as more and more attention is paid to the development of personal qualities of graduates, responsibility for their actions, social and professional activity, awareness of life position and, in general, the development of subjective position in relation to themselves and the world around them. Agency in this cage acts as a result of personal and professional development (in the conditions of) the student group (Kolesnikova & Kolesnikova, 2015), manifested primarily in metasubject and universal competencies and educational activities.

According to the ecopsychological approach to the development of the psyche, agency is understood as the ability of an individual to be a subject of voluntary activity in the form of an activity of a certain type (motor, speech, communication, educational, professional, etc.) On the example of the training preschool children to motor skills and teaching students in a university it was shown that the development of agency goes through the following five stages (Panov, 2014 a, b):

- the first stage: development of the subject of perception;
- the second stage: development of the subject of reproductive reproduction, the subject of imitation;
- the third stage: development of the subject of voluntary action under external control of the teacher;
- the fourth stage: development of the subject of voluntary action under internal control;
- the fifth stage: development of the subject of exteriorization of control, subject of expert evaluation of the correctness of the required action by other individuals (expert position).

It is important, that each subsequent stage suggests a qualitative formation of the previous one. To assessment of the dynamics of development of the student's ability to be a subject of learning activities are the following indicators of activity, resulting from the stages of formation of agency (Panov & Plaksina, 2016).

- 1) the level of activity (on the definition of the subject and agency);
- 2) the level of mental development that is necessary for the conscious and voluntary performance of the required action;
- 3) the level of self-assessment, which is necessary for the reflection of the correctness of the action;
- 4) the level of emotional development that allows to emotionally respond to the success / failure of the action;

5) the level of development of creative imagination as a premise for the actualization of the zone of near development.

However, until now, the determinants of personal development and self-development of schoolchildren, students and their teachers, especially in relation to the formation of competencies, have not been sufficiently studied.

The study of psychological phenomena is usually constrained by the lack of diagnostic tools, so in this work our efforts were aimed at the developing of methodology for assessing the stages of formation of agency (Panov, Kaptsov & Kolesnikova, 2017).

### **3. Research Questions**

We have identified the following questions for the study:

1. specification of the content of the parameters of the model of agency formation, which serves as the basis for the development of the methodology;
2. defining of the structure of the questionnaire;
3. carrying out of empirical research of the stages of development of agency of University students;
4. identification of personal features of students with the formation or non-formation of different stages of agency;
5. verification of psychometric indicators of the developed technique.

### **4. Purpose of the Study**

The aim of the study was developing a method of diagnosis of the stages of agency in conjunction with the regulatory components of the development of action, verification its psychometric indicators (validity and reliability) with subsequent testing.

### **5. Research Methods**

#### **5.1. Participants**

Psychometric studies of the developed method were conducted in the student's pilot version on a sample of students of Samara in the amount of 135 people of the 1st, 2nd and 4th year of the full-time Department of engineering specialties of technical University (age 18-23 y.o.), of which 77 boys. Participants were students of 8 educational groups. The comparison of groups according to the Kruskal-Wallis criterion showed no differences, according to the Mann-Whitney criterion there were no differences by gender. Therefore, further research was conducted for the combined sample.

#### **5.2. Measures**

On the basis of the refined constructs for the diagnosis of the stages of formation of agency, a technique consisting of 54 points was developed. Each point of the method contains two constructs: one – the stage of formation of agency, the second construction of the point-a component of self-regulation of the individual (planning, control and correction). The use of two constructs at each point allowed to reduce the volume of the developed technique, consisting of 6 stages of the informational scales of agency and the 3 scales of the components of self-regulation. As the answers were used five-point scale of Likert from

"strongly disagree "to" fully agree "with the average answer" it "difficult to answer." The presence in the technique, built on the basis of self-report of subjects, the answers "difficult to answer" creates on the one hand comfortable conditions for the subjects in the situation where the subject is really difficult to assess the situation given in the paragraph of the methodology for subject, or there is no motivation for testing, which is often occurs in the "situation of expertise" (Shmelev, 2013), i.e. testing on the initiative of the researcher. On the other hand, in case of exceeding of the number of average answers "difficult to answer" over some critical value, unformed representation of the subject about the diagnosed characteristics can be claimed and taking into account this fact in the interpretation of the results, which increases the validity of the diagnosis. If the number of answers "difficult to answer" exceeded 25% of the total number of answers on the scale, the subject was classified as "unformed agency", otherwise – agency at this stage was considered as formed.

When designing a technique from possible forms of reference to the subject (from the first person "I", plural "You", the position of "Such a person...") we preferred the first of these forms. Personal pronoun "I", our opinion, is the best way to show involvement in the action-model, as well as the direction of assimilation of mental reality (interiorization – exteriorization).

The method is created in two versions for assessment of the stages of formation of agency of students in educational activities and for the teaching staff in teaching activity. The creation of the methodology was preceded by a long work on the refinement of diagnostic concepts and their constituent constructs through collective discussion in the expert group.

Structural validity was assessed by correlation of testing results on methods with the data of psychological monitoring, which included a questionnaire of R. Cattell 16PF, form C (Kapustina, 2001), questionnaires of life-meaningful orientations DLC (Leontiev, 2006), reflexivity of A. Karpov (Karpov, 2003), the style of behavioural self-regulation of V.I. Morosanova (Morosanova & Bondarenko, 2015), a cognitive component of self-understanding of Fenigstein F. A., M. F. Chiera and A. H. Bass (translation into Russian language of V. V. Znakov) (Znakov, 2005), axiological test of personal values ANL 4.5.2 of A. V. Kaptsov (Kaptsov, 2015).

## **6. Findings**

### **6.1. Clarification of the content of the diagnosed parameters of the method**

The method of diagnostics of agency stages in connection with regulatory components of action development was developed with the base on the ecopsychological (ontological) model of stages of agency formation (Panov, 2014a; Panov & Plaksina, 2017b).

The content of the regulatory components of the development of our actions is following. The component of planning suggests an element of foreknowledge, anticipation of results, what will happen in the future, next time and in the future, concerns new ways of action or actions with performing of a new task. The control component includes the desire to check the work done on the basis of the current idea of this action, to assess of the correctness or wrongness of actions, especially when actions repeat, to see that another person makes mistakes, and what is their role, to track the passage of stages of any process. Self-testing will dominate at internalization, external audit – at exteriorization.

The component of correction describes the changes that take into account the shortcomings, the search of optimal ways to achieve the goal and ways of error' elimination. Acting in different ways to achieve the goal, the person checks them, seeks to do as accurately as possible, shapening of proven ways to perfection. A necessary element is the work on one's own personality.

According to the ecopsychological (ontological) model, the formation of agency includes the following seven stages:

1. The subject of motivation (having a need). It is a question of " the natural need of the individual in the manifestation of mental activity in one form or another " (Panov, 2014a), without which the subsequent stages of agency become unnecessary. At this stage of the study, this stage was not included in the content of the method of diagnosis of the stages of agency' formation.

2. Stage of development - the subject of perception of the action-sample ("Observer"). A person at this stage must learn to form an image (mental model) of the action that he must learn. He must consider and understand the action he must do (active perception).

3. Stage of development - the subject of imitation, reproductive reproduction without voluntary regulation ("Apprentice"). At this stage, a person can mechanically repeat a new method of action. But this does not mean that he understands how the action should be performed correctly, and most importantly – why it is so, and not otherwise.

4. Stage of development - the subject of arbitrary execution of the sample action under external control, for the student more often under by the teacher' voluntary ("Learner"). A person at this stage doing a new educational task will not be able to check whether it is performed correctly. He admits the possibility of errors, but for learn quickly how to perform a new task (to learn a new action), he needs - someone have pointed to new action. He doesn't initiative of finding errors to verify the correctness of the task, especially new or difficult, one person prefers to resort to the opinion of the teacher or a friend.

5. Stage of development – the subject of the arbitrary fulfillment of the action, relying upon the internal control ("Master"). Person at this stage plans his training or production action independently. He made a plan of his actions. When something goes wrong, he analyzies thinks over the reason to avoid it in the future. The success of the implementation of actions is determined by person, first of all, by his own efforts under careful internal control.

6. Stage of development 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. Watching how other people perform a pattern of action, he can point out to them for mistakes.

7. The stage of development - the subject of productive development, when the action – pattern has turned from an object of assimilation into a mean of mastering new, more complex actions or for creative self-expression ("Creator"). For such a person, it is important not to stop, for example, to find the best ways to achieve the goal and to feel great satisfaction from it, but to strive to achievement of further success in life, linking much with self-education.

## **6.2. Results of the study and their discussion**

We present the values of the questionnaire's scales for the formed ideas about the stage of agency formation (table 1).

**Table 01.** Average values of rigor scales techniques

The stage of formation of agency	M	SD
Observer	32,86	3,84
Apprentice	30,94	5,61
Learner	30,83	5,56
Master	35,72	3,47
Expert	33,22	3,79
Creator	35,72	4,54
Planning	69,53	6,27
Control	64,06	6,79
Correction	65,72	6,39

Note. M-average value; SD-standard deviation.

Average students determine the formation of their greater degree of such stages of formation of agency as "Creator", "Master" and "Expert". Most likely, of majority of students in addition to independent actions under internal control with desire not to stop there is developing. The ability to predict the work of their own and others.

As the assessment of the formation of the regulatory components the research participants noted that most formed component - "Planning", the least - "Control". This is probably due to the peculiarities of the organization of training of students (full-time) with established regular types of external educational control, and accordingly, reducing the need for developed control of students.

Note that in this sample, all scales and components of self-regulation are formed in more than half cases: most of the scales "Master" (82% of the subjects), "Creator" (74%) and "Observer" (73%) and the component "Planning" (78%). According to the scales of "Apprentice", "Expert" and the component "Control", the formation is noted in 62-63% of the subjects, the least formation is diagnosed on the scale of "Learner" (60%), that is the subject of planning and voluntary implementation under external control. Probably these subjects are least in need of educational impact from the outside, they have more developed self-control and self-development.

We are able to highlight the typology of the formation of the stages of agency and components of regulation. Thus, 71 % of the subjects have more than three of the six stages of agency's formation, 22% of them believe that they have all stages of agency's formation. However, in 17% less than half of the six stages are formed. The unformed of more than half of the components of self-regulation is noted in 29% of the subjects.

It is obvious that this category of students should attract special attention of the persons carrying out pedagogical process in high school, because it is necessary to analyze not only the positive aspects of personal and professional development, but also the negative ones.

Using the Mann-Whitney test the following differences of subjects with under formed compared with subjects with stages of the formation of agency on the scale were revealed:

\*"Observer" - the lower value of traditions, insight (factor n 16 PF) and self-control (factor Q3 16 PF), they have lower overall rate of conscious self-regulation;

\* "Apprentice" - the lower self-sufficiency (by questionnaire of V. I. Morosanova), the value of the less significant areas of life, hobbies;

\* "Learner" - lower motivation (factor Q4-16 PF);

\* "Master" - below the motivation (factor Q4 16 PF) , the indicator of conscious self-regulation by V. I. Morosanova»;

\* "Expert" - higher indicator of conscious self-regulation "Programming»;

"Creator" - less important areas of life, profession, social life, hobbies, the value of creativity, below are the indicators of conscious self-regulation, planning, programming, flexibility and general self-regulation, and are below the value of personal awareness (Fenigstein)

If the component "Planning" is not formed, the subjects have lower self - control (factor Q3 16 PF), if the component "Control" is not formed, the general indicator of conscious self - regulation is lower, the component "Correction" is lower than motivation (factor Q4 16 PF) and indicators of awareness (social self-consciousness and the general level of awareness of the Fenigstein).

As we can see, the differences have axiological and characterological nature. These results also confirm the validity of the method of assessing of the stages of agency formation and coincide with the ones we obtained earlier in explaining the components of self-regulation. Indeed, with low self-control, it is difficult to be a "Master" - the subject of arbitrary action based on internal control (Panov, Kaptsov & Kolesnikova, 2017). Or to be a "Creator" - with low value of creativity the subject of development and creative self-expression. It is noteworthy that the higher ability to program the thinking through algorithms of their actions in the "Expert", which is corresponds to the subject of external control over the implementation of the actions of others.

In one of the methods used (questionnaire 16 PF by R. Kettell), we calculated additionally the coefficient of using average answers. Note that the subjects with unformed stages of "Apprentice", "Learner", "Master", "Expert" and "Creator", as well as with unformed components of regulation "Planning", "Control", "Correction" are marked by the criterion of Mann-Whitney as significant differences in this coefficient, namely: the average answers on the Questionnaire of R. Kettell are selected much more often than the preference of extreme answers, indicating the severity of a particular character traits.

We believe, these results, confirm the sensitivity of the questionnaire to the features of the sample.

### **6.3. Verification of psychometric indicators of the method**

The reliability of the scales (Kronbach's alpha) of the subjects having a clear idea of the formation of their stages of agency (from 53% to 75% depending on the scale) ranged from 0.50 for the "Observer" scale to 0.80 for the "Creator" scale.

Paradoxically, students are more unsure about the formation of stages of the "Learner" (60% of reliable results) and "Apprentice" (64%), while the formation of the stages of agency "Master" (75%) and "Creator" (76%) least of all causes doesn't make in all cases them doubts. The confidence in the formation of regulation components is the highest in planning (71%) and the lowest in correction (59%). It is the variation in the responses of students of the correction component that gave low reliability of the scales "Observer" and "Learner".

Verification of the discriminativeness of the points of the method was carried out by calculating of the indicator "Delta of Ferguson" (Klein, 1994), the average value of which was 0.78, which corresponds to a high level of discriminativeness in the case of the normal distribution of the responses of the subjects.

The design validity was evaluated on a sample of Samara students by correlation of testing results with diagnostic methods. The results of the correlation analysis found that the scale of the stages of the formation of agency "Observer" and "Apprentice" is directly proportional related with the cognitive component of self-understanding (0,62 – scale "Observer" and 0.40 – scale "Apprentice"), reflexivity (0,43 – scale "Observer" and 0.50 to the scale of "Apprentice") and the ability to plan (0,49 – scale "Observer" and 0.58 the scale of "Apprentice"), indicating that students who rated themselves at this stage of the development of agency, highly developed ability to introspect, critical thinking, cognitive development. Most likely they have an adequate self-assessment.

The scales "Master" and "Expert" did not give significant correlations with the package of diagnostic techniques. First of all, we tend to believe that this is due to the low severity of these stages of agency formation among the surveyed students. Although we do not exclude the possibility of invalidity of some points of the questionnaire, which affected the result, which requires further research of these two scales.

The largest number of relationships is set with the scale "Creator". First, the level of stage formation is interrelated with the values of the spheres of life, and with sufficiently high correlation coefficients (0.50–0.55). Secondly, students who consider themselves to be "Creators" perceive this point of view on an existential level, as can be judged by the presence of the relationship with the general scale of life orientations (Znakov, 2005). Third, they have reliability, integrity and high self-control, as evidenced by the relationship with factors G and Q3 16PF. The scales of self-regulation of the developed technique confirmed the constructive validity through the relationship with the scales of the questionnaire of V. I. Morosanova and factors of emotional–volitional sphere of personality of Kettell (correlation coefficients 0,41-0,62), as well as reflexivity (0,47) and cognitive component of self-understanding (0,60).

Thus, the results of the study of the design validity allow us to assert that it is proved for the seven scales of the developed technique. Additional research is required to prove the constructive validity of the scales "Master" and "Expert".

Criteria validity was evaluated by the expert method and showed significant differences between the self-assessment of the formation stage of agency of the subjects and the results of experts. Thus, the majority of the subjects (44%) suggested that they had the stage of "Creator", whereas, according to experts, this is not true in 84% of cases. The difference of opinion of experts with the self-assessment of the subjects at the "Master" stage is slightly less (68%), however, as expected, the overestimation of the subjects prevails.

## 7. Conclusion

Based on the refined content of the ecopsychological (ontological) model of agency, a method of self-assessment of the stage of formation of agency was developed. The technique has shown acceptable for practical use psychometric indicators and can be recommended for research purposes for the study of self-assessment of the stages of formation of agency of students.

According to the results of the study of the stages of formation of agency of University students it was found that some students formed less than half of six stages, they may have some problems with the formation of personal competencies in the educational process. One third of the subjects have not formed more than half of the components of self-regulation, and this suggests that this category of students should be paid special attention of those engaged in the pedagogical process in high school. It is important to

analyze not only the positive aspects of personal and professional development, but also the negative ones. The fact that the least formed regulatory component is "Control" is probably due to the peculiarities of the organization of training of students (full-time) with established regular types of external educational control, and accordingly, the reduction of the need for developed control of students. Perhaps, for students of distance forms of education or adult we would get other results, but at the moment we emphasize the need for special measures of psychological and pedagogical nature, including the mastery of skills as the stages of agency and regulation.

In general, we can say that the development of personality through the passage of certain stages of agency is associated with personal characteristics, with personal features and values, as well as with the features of self-regulation. Understanding these laws actualizes the psychological aspects of support of the educational process in the University for the full formation of future specialists.

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