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**RESEARCH OF STUDENT'S INNOVATIVE BEHAVIOR**

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*Abstract*

Transformations in society need to raise the level of their economic consciousness. The problem is that the level of innovation remains low. The article presents the description of the innovative economic behaviour study. A survey was done on students from different courses. The experiment was aimed at studying the group interaction factors in the formation of innovative behaviour. We proceeded from the proposition that innovativeness is a derivative of individual creativity and external factors, in particular, the factor of group interaction. We assume that factors of group interaction are more important for the development of innovative economic behavior. The case study have a several stages. First, the level of individual creativity and innovativeness was studied. Then the subjects received a task during the week. To successfully solve the problem in the group, both cognitive and social processes must simultaneously develop. The results show that, for the group to be successful, the participants should not only formulate problems and suggest ideas for its solution, but also pay attention to converting understanding into concrete actions to achieve results. The results showed that the level of individual creativity is not a sufficient condition for the manifestation of innovative behaviour. Group factors play an important role in it as well. More importantly for team work is intra-group cognitive and social processes. In addition, the results of the case study, suggest that innovation is a skill that can be developed.

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## 1. Introduction

Transformation of the Russian economy, its transition to an innovative way of development cannot be carried out without human resources capable of implementing an innovative breakthrough, with the necessary professional and personal qualities, and economic behaviour should be characterized by activity, readiness for innovation.

Economic behaviour is a subject of study of several sciences: economics, sociology, psychology. The psychological approach, unlike the economic one, presupposes limited rational choice. Specificity of the subject of psychology is to study such aspects of a person's economic behaviour that go beyond rational choice. It is known that the creative person has the consciousness and the abilities to address crisis in transformative ways (O'Hara, 2017).

## 2. Problem Statement

At the moment, we can identify several research areas performed by the Russian psychologists. The general methodological bases of economic consciousness and innovativeness are developed by A.L. Zhuravlev & A.B. Kupreychenko, A.D. Karnyshev, V.E. Klochko E.V. Galazhinsky, A.N. Neverov, L.S. Yagolkovsky etc. The economic consciousness is a private form of consciousness that is found in different forms of knowledge about various economic facilities (Pozniakov, 2007). By the economic consciousness we mean "social representations, attitudes, relationships, evaluations, opinions of a person on the economic content of the various phenomena (economic objects)" (Zhuravlev & Kupreychenko, 2007). The economic consciousness is a result of the interaction between an individual and the socio-economic environment (Yagolkovsky, 2010). The economic consciousness formation is a result of socialization and the process of integration of an individual into the system of economic relations and self-awareness of an individual as an economic relations subject (Karnyshev, 2011).

In this paper, by innovative economic behaviour, we understand creative forms of human behaviour under the influence of economic alternatives, which contribute to economic efficiency improvement. In other words, an innovative behaviour is held to imply the originality of the way of implementing the economic behaviour in the situation of profit extraction. The main characteristics of such behaviour are 1) creativity or originality of the way the idea is realized; 2) fluency (number of ideas) and flexibility (versatility of ideas); 3) economic efficiency.

In the history of the study of innovative processes, one can observe a change in several paradigms of understanding their essence. The originally developed model of innovation processes has undergone significant changes, became more complex, and branched. Modern models resemble interworking systems that operate on the principle of networks, which are characterized by the intensification of both internal and external links. Accordingly, their tasks and problems are of an interdisciplinary character and a cohesive teamwork is needed to solve them. Communicative skills, skills of teamwork and cooperation become key competencies. "Creativity alone does not necessarily generate innovation and may assume, in part, responsibility for its promotion or being one of the sources of innovation" (Bogel & Upham, 2018).

Analyzing the team's collaborative work we can be premised on a collaborative problem-solving (CPS) method, which represents a complex process when two or more people try to solve a problem by

sharing their understanding and efforts needed to do so by combining knowledge, skills and efforts to reach decision (Chang et al., 2017). The method assumes three main competencies: establishing and maintaining a common understanding; taking appropriate measures to solve the problem; creation and maintenance of the team.

These competencies arise from a combination of two interrelated processes: social and cognitive. That is, to understand and solve a problem, students should have the skills of interaction, communication as well as the skills to regulate actions in order to solve the problem (Hesse, Care, Buder, Sassenberg, & Griffin, 2015). The cognitive process (the ability to solve problems) implies studying and understanding of the content of the problem, the presentation and formulation of the hypothesis, the planning of a strategy for solving the problem, monitoring results and reflection. Social processes are aimed at establishing mutual understanding, taking appropriate measures to solve the problem (coordination), as well as the formation of a team and supporting it. The method of joint problem solving facilitates the integration of these two processes.

### **3. Research Questions**

What is the role of group problem-solving process in the development of innovative behavior? We assume that the quality of group processes (emotions, problems definition and problems solving) determines the success of the group.

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

The main purpose of the experiment was to identify factors that affect the innovative economic behaviour of team members. The sum and substance of the experiment were that students had to earn some money in one week, having 100 rubles as initial capital. In order to successfully solve this problem, students needed to demonstrate the ability to see and articulate the need, unconventional thinking, entrepreneurial attitude and the ability to work in teams

### **5. Research Methods**

#### **5.1. Participants**

In total 74 students participated in the experiment, 19% of them were men and 81% of them were women. Age composition: 52 (70%) students at the ages from 18 to 21, 18 (24%) people at the ages from 22 to 25, 4 (5%) people over 25 years.

The experiment was carried out on two different samples. In the first sample, there were 41 students, 24% of them were men and 76% of them were women. In the second sample, there were 33 students, of which 12% were men and 88% were women.

#### **5.2. Instrument and Procedures**

The experiment was carried out in three stages. At the first stage, a group testing was conducted. The purpose of testing is to identify the level of individual creativity of participants. In order to assess

creativity, we used three methods: “Drawing Completion Test”, a shortened version of the Torrance Creativity Test, the questionnaire “Self-appraisal scale of innovative personality qualities” (Lebedeva & Tatarko, 2010), “Questionnaire for assessing the predominant type of readiness for innovation” (Zagashev, 2010).

- Torrance Creativity Test “Drawing Completion Test” is a set of pictures with a certain set of elements (lines), using which a testee need to finish the picture to some meaningful image. Drawings are evaluated according to the following criteria: originality, flexibility, fluency and elaboration.
- The questionnaire developed by Lebedeva and Tatarko (2010) consists of 12 questions with reference to which the overall innovation index is assessed. The methodology also includes subscales: creativity, a risk for success, future-orientated thinking.
- Zagashev (2010) when assessing readiness for innovation, distinguishes 7 types of behavior: 1) willingness to follow a leader; 2) readiness, subject to material compensation; 3) willingness, subject to a possibility to take responsibility for innovation; 4) readiness, subject to personal and professional self-realization; 5) readiness, provided there are no major changes; 6) readiness based on past experience; 7) readiness on the basis of positive emotional perception of everything new. The questionnaire includes 56 statements and a respondent should express his/her attitude towards them.

Testing was conducted in the group. Based on the test results, groups of 7-8 people were formed. We tried to form the groups in such a way that they did not differ much in terms of creativity, i.e. in each group, there were participants with high, medium and low levels of creativity.

At the second stage, a group work was aimed at activating its work, discussion of the problem, during which the members of the group jointly discussed the options for solving it. As the main task, the students were offered a well-known entrepreneurial task “Imagine that your group has 100 rubles. Your task is to multiply these 100 rubles in one week”. The discussion was conducted by brainstorming. After the announcement of the assignment, the participants worked individually. All possible solutions to the problem the participant recorded on a separate paper. The individual stage of work was limited to 10 minutes. Then the participants were invited to team up and continue the discussion. The group considered the options proposed by each participant. During the discussion, the options were further developed and revised. As a result of the group work, each group had to choose only three options discussed, among which there were the most successful in their opinion, the most unsuccessful and average. Then the groups presented their ideas.

The process of discussing the problem was recorded by the observers, and it also was recorded on a video. The participants of the experiment were notified in advance that the process of discussion will be fixed by the observers and recorded with the help of the video equipment. To fix the results, we used R. Beils' observation scheme, which allowed us to track the interaction of people in the group. R.Beils identifies 12 categories of interaction, grouped by different domains: positive emotions, negative

emotions, articulating the problem and solving the problem. As a recorded observation, only verbal interactions of the participants were accepted.

At the end of the session, the groups received the same task, but this time they had to perform it in reality. Thus, each group had 100 rubles and one week at their disposal. A week later we had a meeting with the participants, each group presented the results of their work. We also discussed how the task was completed; the students expressed their thoughts and feelings.

## 6. Findings

We analyzed test methods, results of the assignment, protocols for monitoring the discussion of the problem in the group and video materials.

### 6.1. Part I - Results

In the developmental psychology literature shows that between 15 and 25 years of age adolescents possess traits of successful innovators. They are collaborative, creative, observant, curious, willing to experiment, willing to challenge the status quo, risk-takers, action oriented, and visionary (Dougherty & Clarke, 2018). The results revealed that respondents of our study showed average results. Testing was conducted in the group. We compared the results of the assignment with the results using the method by Lebedeva and Tatarko (2010) in Table 01. We assumed that the highest scores would be earned by Group 2 but we were wrong, Group 2 showed average results.

**Table 01.** Indicators of innovativeness in groups

Team	Overall innovation index	Creativity	Risk for success	Future-oriented thinking
Group 1	3,2	3,41	2,97	3,2
Group 2	3,4	3,5	3,1	3,6
Group 3	3,68	3,91	3,38	3,75
Group 4	3,37	3,16	3,41	3,53
Group 5	2,92	3,14	2,68	2,93

In terms of the overall innovativeness index, Group 3, earning the least, showed the highest index. This group showed high rates on creativity and future-orientated thinking but despite this, the group failed to use its potential.

### 6.2. Part II - Results

At the second stage, a group work was aimed at activating its work, discussion of the problem. The analysis of the group discussions monitoring protocols showed significant differences in the behaviour of the participants in more “successful” groups.

**Table 02.** Number of observations

Categories	Group 1	Group 2	Group 3	Group 4	Group 5
Positive emotions area	8	21	29	12	6
Problems definition area	35	25	44	20	14
Problems solving area	14	14	8	15	9
Negative emotions area	6	3	26	3	9

Analyzing the protocol data, we gathered that Group 2, which was more successful in performing the task, differs from other groups in demonstrating more positive emotions during the discussion (21, here and below these are the number of recorded interactions) and very few negative ones (3). Quite a lot of participants of the group interacted in the area of defining the problem (25).

Comparing the results of Group 2 and Group 4, we can see that the distribution of interactions across areas seems to be also dominated by positive emotions in both problem posing and problem-solving areas. We can assume that the group did not have enough dynamics, this is a question for further reflections.

Interestingly, Group 3, which earned less money, gave quite a lot of positive emotions (29), and the participants actively interacted in the problem-raising area, much more than in Group 2 (44). At the same time, more interactions were observed in the area of negative emotions (26), and comparatively little in the problem-solving area (8).

It was shown in similar studies that both divergent and convergent thinking are presented in creative problem solving: the generating ideas using creative thinking followed by cognitive processes, demanding the evaluation and implementation of ideas, which are more related to critical thinking. (Wechsler et al., 2018).

It should be noted that not all groups completed the assignment together. In Group 1, the task was performed by only one participant. Analyzing the process of interaction, it can be found that the group was mainly focused on cognitive processes, showed less emotion, both positive and negative.

### 6.3. Part III - Results

The main purpose of the experiment was to identify factors that affect the innovative behaviour of team members. The following criteria were chosen for evaluation: the amount of money earned in one week, the number of ideas worked out simultaneously, the originality of the ideas. The originality of the ideas realized meant the ability to look at the problem from the other side, the ability to solve it in an unconventional way.

**Table 03.** Results of the task execution by the teams

№	Team	Earned sum, rub	Number of ideas	Originality of ideas, solving the problem
1	Group 1	500	1	They bought yarn for 100rub, made teddy bears and sold them
2	Group 2	1450	5	1. Doing Implementation of the Students' Individual Work 2. Use of their workforce (work on the side) 3. Playing cards

				4. Playing chess 5. Voluntary donations for "freehugs"
3	Group 3	64	1	Retail (reselling noodles)
4	Group 3	300	1	Retail (reselling chocolate bars)
5	Group 5	800	1	Singing and playing guitar

The general results show that among the proposed and implemented ideas, there were often common ways of earning money but the participants of Group 2 were more rational. They independently decided to work out several variants, suggesting the solution to the problem in different ways.

## 7. Conclusion

Summarizing the results of the experiment, it can be noted that the participants showed entrepreneurial behaviour. Taking into account that innovative behaviour is a certain process, which includes several stages, it can be assumed that when performing the assignment, participants could show innovativeness at different stages. So, for example, it could be an original idea or an original way of implementing a template idea. Analyzing the ideas suggested by the participants, we see that already at the stage of generating ideas there are some limitations that make it difficult to look at the problem from the other side, with other eyes.

Thus, to successfully solve the problem in the group, both cognitive and social processes must simultaneously develop. Social processes should be aimed at supporting, encouraging, understanding, which contributes to the establishment of a favourable socio-psychological climate, the creation of an "environmentally friendly", safe atmosphere in the group. The results show that, for the group to be successful, the participants should not only formulate problems and suggest ideas for its solution, but also pay attention to converting understanding into concrete actions to achieve results.

We found that in our case, more important was not the experiment itself, but its aftereffect, the processes that were launched. The feedback received from the participants showed that the experiment aroused great interest among students and most importantly, the participants noted an increase in motivation, activation of thinking aimed at searching. Already after the experiment, new ideas for implementation emerged; there were a desire and interest in trying and mastering new forms of behaviour. That is, the experiment itself as a form of teaching innovative behaviour gave its results. Thus, innovation is most likely a skill, an ability that can be developed.

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