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Role of Cognitive Processes in the Implementation of Research Activity by Students

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Abstract

The purpose of this study was to recognize various characteristics of students' and tutors' cognitive sphere in terms of research activity (RA) efficiency. Significant differences in flexibility and logic thinking between researchers with various levels of professional aptitude were traced. Students with high level of research potential (RP) showed a marked ability for situational analysis, knowledge implementation and consolidation, flexibility thinking and analytical style of thinking. Students with low level of RP demonstrated rigid thinking and limited capacity for abstraction. Relevant connections between RP components and certain characteristics of cognitive sphere were discovered.

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Keywords: Student; Research potential (RP); Research activity (RA); Cognitive component of research potential; Questionnaire "Scientific research potential" ("SRP").

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1. Introduction

This study was conducted within a larger project on students RP run by the Department of Psychology and Education in Personal and Professional Development of St-Petersburg State University. RP is considered as subjective psychological qualities multi-dimensional all-level system that secures capacity for efficient and result-oriented work in achieving research goals (N.V. Bordovskaya et al., 2012). According to the adopted concept RP was divided into three main structural-functional components: conative, cognitive and performing (S.I. Rozum, 2012). Thorough RA analysis established the most vital personal cognitive qualities for carrying it out effectively: the ability to effectively operate with concepts, unique style of thinking, divergent facilities (creativity, verbal thinking), flexibility thinking, well-developed capacity for reflection (A.N. Poddyakov, 2006; N.N. Pachina et al., 2008). RA result is qualified as objectively or subjectively new information acquiring (A.V. Leontovich, 2003) or as a “breakthrough” in knowledge based on the previous data and human experience (E.R. Vazhnova, 2010).

V.D. Druzhinin (2007), M.A. Kholodnaya (2002) et al., point out four major intellectual aspects corresponding to four types of intellectual qualities or capacities:

- Convergent facilities
- Divergent facilities (creativity)
- Educability
- Cognitive styles

Each intellectual facility is considered to be intellectual characteristic deriving from individual mental experience content and structure particularities (V.N. Druzhinin, 2007; M.A. Kholodnaya, 2002). Our study concentrated on some of the researchers’ cognitive particularities that are part of the intellectual qualities listed above (learning capacity excluded). We sought to identify the cognitive patterns of researchers with different levels of professional aptitude and the cognitive patterns of students with different RP levels measured using an original questionnaire SRP.

2. Research description and methods

Research methods and procedure. Sample group consisted of 79 bachelor’s students from the Economics faculty, 40 master’s students from the History and Psychology faculties, 40 lecturers and tutors at St-Petersburg State University, 94 master’s students from the Institute of Childhood of the Russian State Pedagogical University named after A.I. Herzen.

Blank versions of the following methods were used:

1. SRP (Scientific Research Potential) method created by the Department of Psychology and Education in Personal and Professional Development, assessing scientific RP level. This method allows general RP level measuring by adding up demonstrated intensity of conative, cognitive and performing component scores.

2. Intelligence structure test (TSI) by R. Armthauer, subtests 1-4 used convergent facilities and conceptual system assessing.

3. The questionnaire “Thinking Styles” by A.F. Harrison and R.M. Bramson (adapted by A.Alekseev, L.Gromova) for cognitive style assessing.

4. The test of verbal creativeness (RAT) by S. Mednic (version for adults, adapted by A. Voronin) for divergent facilities assessing.

5. A. Luchin’s test for flexibility/rigid thinking assessing (*Psychological Workshop* edited by L. Porkhacheva, K. Jus, 2009)

6. The procedure of diagnostics of reflexivity by A. Karpov (2003).

SPSS-20 was used for data processing.

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