ISSN 2334-847X (Printed)
ISSN 2334-8496 (Online)

IJCR SEE

INTERNATIONAL JOURNAL OF COGNITIVE RESEARCH IN SCIENCE, ENGINEERING AND EDUCATION

IJCRSEE

Volume 8, Issue 1, April 2020.

www.ijcrsee.com

ISSN 2334-847X (Printed)
ISSN 2334-8496 (Online)

INTERNATIONAL JOURNAL OF COGNITIVE RESEARCH IN SCIENCE, ENGINEERING AND EDUCATION

IJCRSEE

Volume 8, Issue 1, April 2020.

IMPRESSUM

International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE)
Volume 8, Issue 1, April 2020.

Editor in chief:
Dr. Lazar Stošić

Publisher:
The Association for the development of science, engineering and education
Address: Prvi maj 18, 17500 Vranje, Serbia
Phone: +381 17 400 165, + 381 63 700 4281
www.urnio.org.rs
E-mail: predsednik@urnio.org.rs

For publisher:
Dr. Lazar Stošić

Print:
Aurora O. D. Vranje

Circulation:
100 copies

Indexed & Abstracted:
SCOPUS, SJR - Scimago Journal, ProQuest, EBSCO (Academic Search Ultimate Magazines and Journal), SCIndeks, DOI Serbia, Central and Eastern European Online Library (CEEOL), Dimensions, CyberLeninka, e-Library RU, COBISS.SR, MIAR, Sherpa/Romeo, CNKI, Turkish Education Index, ROAD, GoogleScholar, Dialnet, Index Copernicus, Harvard University Library, WorldCat, PUBDB DESY Publication Database, Journals Index (OAJI), I J-Gate, Cabell's Directory, JOUR Informatics, Academic Journals Database, WorldWideScience Sources, UlrichsWeb, TIB-German National Library of Science and Technology, Science Central, Electronic Journals Library, Academic Keys, ETH-Bibliothek, BASE, PBN, OAJ, JournalTOCs...

CONTENTS

International Journal of Cognitive Research in Science, Engineering and Education

(IJCRSEE)

EDITORIAL

International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE) is an open access international peer-reviewed, open-access journal, which provides a platform for highlighting and discussing various cognitive science issues dealing with the problems of cognition (and its evolution) within some specific subject field - philosophical, psychological, linguistic, mathematical, psychogenetic, pedagogical, ergonomic. Editorial Board strives to provide a possibility for the scientists of different fields to publish the results of their research, technical and theoretical studies. IJCRSEE is multidisciplinary in approach, and will publish a great range of papers: reports of qualitative case studies, quantitative experiments and surveys, mixed method studies, action researches, meta-analyses, discussions of conceptual and methodological issues, etc. IJCRSEE publisher is The Association for the Development of Science, Engineering and Education, Vranje, Serbia.

IJCRSEE particularly welcomes articles on the results of scientific research in various fields of cognitive science (psychology, artificial intelligence, linguistics, philosophy and neuroscience) catering for international and multidisciplinary audience. Readers include those in cognitive psychology, special education, education, adult education, educational psychology, school psychology, speech and language, and public policy.IJCRSEE has regular sections: Original Research, Review Articles, Studies and articles, Book Reviews, Case Studies, and is published twice a year. This journal provides an immediate open access to its contents, which makes research results available to the public based on the global exchange of knowledge. The journal also offers access to uncorrected and corrected proofs of articles before they are published.

The main **aim** of the Journal is to discuss global prospects and innovations concerning major issues of cognitive science, to publish new scientific results of cognitive science research, including the studies of cognitive processes, emotions, perception, memory, thinking, problem solving, planning, education and teaching, language and consciousness study, the results of studying man's cognitive development and the formation of basic cognitive skills in everyday life. The Journal seeks to stimulate the initiation of new research and ideas in cognitive science for the purpose of integration and interaction of international specialists in the development of cognitive science as interdisciplinary knowledge.

All articles are published in English and undergo a peer-review process.

The **scope** of IJCRSEE is focused on cognitive research both in topics covered as well as disciplinary perspective:

- Cognitive Research in Education
- Cognitive Pedagogics
- Cognitive Psychology
- Psycholinguistics
- Cognitive Linguistics
- Cognitive Culture Studies
- Cognitive Neurophysiology
- Cognitive Aspects: Sport Culture
- Cognitive Aspects: Methodology of Knowledge
- Text Processing and Cognitive Technologies
- Curriculum Development
- Development of Learning Environment
- Education Administration
- Educational Psychology
- Educational Technology

- Elementary Education
- Innovative Pedagogical Models
- Learning Systems Platforms
- Media Education
- Science Education
- Teaching and Learning Technologies

IJCRSEE has an international editorial board of eminent experts in their field from Russia, USA, Republic of Macedonia, Germany, Hong Kong, Greece, Serbia, Australia, United Kingdom, USA, Turkey, Nigeria, Bulgaria, Romania, Spain, Italy, Republic of Srpska, Croatia, Kingdom of Saudi Arabia (KSA), India, China, Thailand, Israel, Malaysia, Morocco, Jordan,, Iran... We are confident that IJCRSEE will attract a great number of editors, eminent scientists in the field. The selection will be based on the activities of the editors and their desire to contribute to the development of the journal.

IJCRSEE provides a platform for academics and scientists professionals to refer and discuss recent progress in the fields of their interests. Authors are encouraged to contribute articles which are not published or not under review in any other journal.

Each submitted manuscript is evaluated on the following basis: the originality of its contribution to the field of scholarly publishing, the soundness of its theory and methodology, the coherence of its analysis, its availability to readers (grammar and style). Normal turn-around time for the evaluation of manuscripts is one to two months from the date of receipt.

Submission of an original manuscript to the journal will be taken to mean that it represents original work not previously published, that is not being considered elsewhere for publication; that the author is willing to assign the copyright to the journal as per a contract that will be sent to the author just prior to the publication and, if accepted, it will be published in print and online and it will not be published elsewhere in the same form, for commercial purposes, in any language, without the consent of the publisher.

The names and email addresses entered in this journal site will be used exclusively for the stated purposes of this journal and will not be made available for any other purpose or to any other party.

The requirement for the submission of a paper implies that it has not been published before; that it is not under consideration for publication anywhere else; that its publication has been approved by all co-authors.

When considering submitting an article, the Editors have provided the following criteria to assist authors with preparing their submissions:

Originality – The author should ensure that the manuscript has not been previously published nor is being considered by another journal.

Plagiarism - Content should be properly referenced. Be sure to check the paper for possible accidental plagiarism. Some plagiarism checker websites include: http://www.ithenticate.com/, www.antiplagiat.ru, www.grammarly.com, www.plagtracker.com or www.duplichecker.com

Writing – Please write in good English (American or British usage is accepted, but not a mixture of these). For non-native English speakers, and perhaps even for some native English speakers, grammar, spelling, usage, and punctuation of the texts are very important for an effective presentation. Hence, manuscripts are expected to be written in a clear, cogent, and readily understandable by an international readership.

Manuscripts must be submitted online. Electronic submission reduces the editorial processing and reviewing time. As part of the submission process, authors are required to check off their submission compliance with all of the following items, and submissions may be returned to authors who do not adhere to the following guidelines:

The submission has not been previously published or presented to another journal for consideration (or an explanation has been provided in Comments to the Editor).

The submission file is in OpenOffice, Microsoft Word, RTF, or WordPerfect document file format.

Where available, URLs for the references have been provided.

The text is single-spaced; uses a 12-point font; employs italics, rather than underlining (except with URL addresses); and all illustrations, figures, and tables are placed within the text at the appropriate points, rather than at the end.

The text adheres to the stylistic and bibliographic requirements outlined in the Author Guidelines.

If submitting to a peer-reviewed section of the journal, the instructions in ***Ensuring a Blind Review*** have been followed.

A manuscript goes through the peer review process. Authors submit manuscripts to **Editorial office** via the online system. The acknowledgement letter should be sent to the author to confirm the receipt of the manuscript. The Chief Editor first reviews manuscripts. Chief Editor is assisted by Section Editors (could also be Co- or Associated Editors). The Editor assigns a Section Editor to see the manuscript through the complete review process and return it with a recommendation or decision. The manuscript is checked to see if it meets the scope of the Journal and its formal requirements. If it is incorrect or unsuitable, the author should be informed and the manuscript filed (or returned if requested) – direct rejection. Manuscripts that are not suitable for publication in the Journal are rejected. A Rejection letter is sent to the author stating the reason for rejection. If the manuscript conforms to the aims and scope of the Journal, and formally abides by the Instructions to Authors it is sent out for review. Depending on the type of paper, it could be accepted immediately for publication (invited Editorial, Book review etc) by the Chief Editor.

Check that the manuscript has been written and styled in accordance with the Journal style; that it carries an abstract (if applicable), keywords, correct reference system etc. and check that the correct blinding system has been used. If anything is missing ask the author to complete it before the manuscript is sent out for review.

The manuscript is sent out for review. The reviewer reads and evaluates the manuscript and eventually sends a review report to the Chief Editor. The time for review can be set to 2-6 weeks depending on the discipline (more time is usually given to papers in the humanities and social sciences). Make sure to provide the reviewer with clear instructions for the work, e.g. outlined in the form of a Review report or a number of questions to be considered.

Based on the reviewers' comments the Chief Editor makes a decision to:

- Accept the manuscript without further revision
- Accept after revision
- Ask authors to resubmit
- Reject

An acceptance letter is sent to the author and the final manuscript is forwarded to production. Sometimes, the authors are requested to revise in accordance with reviewers' comments and submit the updated version or their manuscript to the Chief Editor. The time for review can be set to 2-8 weeks depending on the discipline and type of additional data, information or argument required. The authors are requested to make substantial revisions to their manuscripts and resubmit for a new evaluation. A rejection letter is sent to the author and the manuscript is archived. Reviewers might be informed about the decision.

After review a manuscript goes to the Copy Editor who will correct the manuscript concerning the correct referencing system, confirmation with the journal style and layout. When Copy Editor finishes his/her work they send manuscripts to the Layout editor.

Layout Editor is responsible for structuring the original manuscript, including figures and tables, into an article, activating necessary links and preparing the manuscript in the various formats, in our case PDF and HTML format. When Layout Editor finishes his/her job they send manuscripts to Proof Editor.

Proof Editor confirms that the manuscript has gone through all the stages and can be published.

This issue has 8 articles (6 original research and 2 review articles). Our future plan is to increase the number of quality research papers from all fields of science, engineering and education. The editors seek to publish articles from a wide variety of academic disciplines and substantive fields; they are looking forward to substantial improvement of educational processes and outcomes.

Editor in Chief
Assist. prof. Dr. Lazar Stošić

International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE)

Address: Prvi maj 18, 17500 Vranje, Serbia
Phone: +381 17 400 165, + 381 63 700 4281
Web: www.ijcrsee.com, **E-mail**: editor@ijcrsee.com

COGNITIVE AND STYLE PREDICTORS OF THE STUDENTS' PSYCHOLOGICAL WELL-BEING

Dr. Kibal'chenko A. Irina, Department of psychology and life safety, Federal State-Owned Educational Autonomy Establishment of Higher Education «Southern Federal University», Taganrog, Russian Federation
E-mail: kibalirina@sfedu.ru
Dr. Eksakusto V. Tatiana, Department of psychology and life safety, Federal State-Owned Educational Autonomy Establishment of Higher Education «Southern Federal University», Taganrog, Russian Federation
E-mail: exakusto@sfedu.ru

ARTICLE INFO

Original Research
Received: February, 06.2020.
Revised: March, 15.2020.
Accepted: March, 22.2020.
doi: 10.5937/IJCRSEE2001001K

UDK
159.922.072-057.874
159.923.072-057.874

Keywords:
cognitive style,
psychological well-being,
basic beliefs,
predictors

ABSTRACT

The article analyses the psychological well-being and basic beliefs of students from the point of view of various variables, but the particular attention is payed to cognitive style, which is studied as the way of information assessment, determining person's intellectual activity as well as own life activity in general. Theoretical and multivariate regression (stepwise method) analyses allowed us to define the models of psychological well-being and basic beliefs predictors at the significance levels from $p \leq 0.000$ to $p \leq 0.043$. The number of the students' basic beliefs and psychological well-being style models is 17 of hypothetical 18 models; this result reflects a high (94.4 percent) study subject matter coverage. The following groups of the models were pointed out in a process of categorization: "harmonic" (these cognitive styles are highly efficient and prove that the style criteria correlate with the basic beliefs and psychological well-being ones); "tending to harmonize" (characterized by the cognitive styles inclusiveness dominating, leading to activity efficiency, but including individual style pole-correctors); "ambivalent" (cognitive style poles inclusiveness dominates, while other poles domination decreases). The following conclusions are made on the basis of statistically significant results: the level and peculiarities of the style poles and students' psychological well-being and basic beliefs regression equations correlation is the determinant, defining the success of these poles and beliefs directly or indirectly. The results of the research enlarge scientific facts about cognitive styles being predictors of students' psychological well-being and basic beliefs and make their metacognitive regulation and evaluation possible.

1. INTRODUCTION

The problems of psychological well-being are topical in a modern world. Unfavourable trends and difficulties in life of modern human increase the number of stressed persons unsatisfied with their lives, assessing the world from a pessimistic point of view. In this case personal self-confidence, commitment to succeed, belief in a better future is lost; person becomes less active and tenacious; as a result person's life goals and values change. It is impossible to change the external, objective circumstances that determine the person's well - being, but it can be assumed that the well - being of a person is mainly determined by the peculiarities of one's perception, analysis and assessment of the surrounding world. Each event (situation, circumstances) becomes psychologically important and meaningful as a result of personal perceiving, categorizing and understanding it. The conceptual abilities of a person, expressed in categorizing, explaining, interpreting, cognitive style prevailing (analytic/synthetic perception, reflexivity /impulsiveness, differentiation/ integrity, etc.), reflect the peculiarities of a

Corresponding Author
Dr. Kibal'chenko A. Irina, Department of psychology and life safety, Federal State-Owned Educational Autonomy Establishment of Higher Education «Southern Federal University», Taganrog, Russian Federation, E-mail: kibalirina@sfedu.ru

person's cognitive assessment of the social conditions and environment, events and situations. Cognitive and style strategies used by humans to evaluate themselves and the world around can determine persons' basic beliefs and psychological well - being. This scientific guess determined the purpose of this research.

If analyzing the notion of "well-being", it is important to note that there are many approaches nowadays (e.g., Bradburn N. Diener, E., Deci E. L. Ryan, K. Ryff C. Waterman A. S., Luhmann M., Hofman W., Eid M., Lucas, R. E., Fesenko P. P., etc.) focused on different definitions and peculiarities of this notion. So, two models of well-being are traditionally defined: subjective well-being (SWB) (Luhmann et al., 2012; Diener and Ryan, 2009) as well as psychological well-being (PWB) (Ryff, 1995).

Theoretical analysis of the studies carried out helps to identify the basic characteristics of the "well-being" notion.

To begin with, the "well-being" is an integral social and psychological notion, including person's cognitive appraisal and attitude to oneself, one's life, personal orientation (and its level) on achieving basic components of positive living and thinking.

Secondly, well-being correlates with a large number of objective and subjective variables reflecting different aspects and spheres of human life. Thus, objective factors of well-being include: social relations, peculiarities of the environment (including social and economic conditions), number of brothers and sisters, living conditions, mother and father's level of education, etc. (Malkoç, 2011).

Subjective factors can be conditionally classified into:

• individually-typological (physiological): physical viability, physical activity, somatic symptoms, stress, physical and psychological health (Kern et al., 2015; Malkoç, 2011); chronic fatigue syndrome (CFS) (Mason et al., 2019).

• cognitive (intellectual): the level of brain building (Kern et al., 2015) cognitive control, self-reflection (Shi, et al, 2018); consciousness (Iani et al., 2017), creative thinking (Mason et al., 2019; Kholodnaya, 2015), etc.

• personal: subjective feeling of happiness, life satisfaction (Waterman, 2008); psychological safety, value, control (Horvath, 2018); inwardness (Kern et al., 2015); self-efficiency, resilience (subjective vitality) (Fini et al., 2010); the five board personality traits (Big Five Personality), i.e. neuroticism is a negative predictor of subjective well-being whereas extraversion and conscientiousness are positive predictors of subjective well-being; self-confident coping style, etc. (Malkoç, 2011).

• social and psychological: relations with other persons (Carnelley, K.B., and Janoff-Bulman, R., 1992), forgiveness (lack of feeling of guilt) (Bono, McCullough and Root, 2008); hope for the future, success, etc. (Kern et al., 2015; Sheridan et al., 2015).

Thirdly, each person has own "standard" of psychological well-being (Rasskazova et al., 2017). That is why it is necessary to take into account directly measured level of well-being while studying this notion, as well as an internal, individual coordinates system which correlates with a person's own psychological well-being understanding.

Fourthly, general concept of psychological well-being can be divided into "ideal psychological well-being" defined as the degree of person's orientation on positive functioning (desire to be and to act autonomously, to have positive relations with people around, to grow and develop personally, etc.); and "real psychological well-being", i.e. subjective estimation of this orientation level in person's real life. Moreover, this aspect considers "well-being" as a combination of two states: instant (the level of person being satisfied with occasional life experience) and predictive (reflects the expected probability of person being satisfied with the future aspirations) (Kopsov, 2019).

In a fifth place, "well-being" has a complex structure including cognitive and affective components. Despite the diversity of views on the structure of well-being (e.g., a newly introduced Seligman 's PERMA model includes five elements of psychological well-being: positive emotions, engagement, relationships, meaning, and achievement), it can be pointed out that the basic elements of the well-being are a person's cognitive and emotional assessment of life and its conditions (Kern et al., 2015; Shi, et al, 2018).

The well-being affective component is subdivided into positive affect (a level that makes person to be happy and pleased with being involved into activity) and negative affect (the level of subjective distress) (Emmons, 2004). From this point of view, the emotional component corresponds to positive emotions, optimistic feelings and distress minimizing.

Cognitive component of the well-being is more complex and multiple. Some Russian researchers (Savchenko and Golovina, 2006) emphasize that the basis of the well-being cognitive component is the person's meanings, values, goals system; this fact is confirmed by other researchers. In particular, it was found out that the personal meaning has close links with subjective and psychological well-being: the goal, inherent in the meaning of a life concept, is the core component of young people well-being forming (Krok, 2018). At the same time, people with a high level of psychological well-being are characterized by ability to realize and implement significant values: the higher the level of the person's well-being is, the more accessible the significant terminal values (from the point of view of possession and implementation) are.

Meaning, goals and values reflect the person's real attitude to the world. They perform a guiding function, help to organize the internal world of the subject; i.e. the well-being is closely connected with the person's basic beliefs.

Basic beliefs are person's hierarchically organized cognitive and emotional implicit opinions, judgments and knowledge, which help the person to perceive the events of the world around and determine person's behavior. Such conclusion can be drawn on the basis of the S. Epstein's cognitive-experimental self-theory and R. Janoff-Bulman's cognitive concept of the person's basic beliefs. There are studies that prove the connection of human well-being with basic beliefs. Thus, the research of Dzuka and Dalbert, (2006) shows that the belief in a just world (BJW) has a positive connection with subjective well-being of old age persons both in general and taking into account individual predictors: subjective health, social contacts (Dzuka and Dalbert, 2006).

There are lots of studies nowadays (e.g., E. G. Antiperovich, S. A. Bogomaz, R. M. Shamionov, etc.) reflecting the relationship between basic beliefs and such variables as self-confidence, sense of life, person's mental and psychological health, etc. Such researchers as Goldenberg, I., Matheson, K., point out that humans (who had psychological trauma in their lives) having positive basic beliefs can be characterized by develop less stressful feelings and tend to use more active and constructive coping strategies (Goldenberg and Matheson, 2005). On the other hand, if a person is exposed to existential stress for a long period of time, own personal view of life and basic beliefs can be negatively affected and changed. In particular, if a person is depressed or distressed the view of life can even be merciless, basic beliefs are less favourable (e.g., belief in a just and controlled world is poorly expressed, a weak belief in self-control prevails, i.e. the world seems to be unjust and uncontrolled by person) (Załuski, 2015). Almost the same tendency was found in the research of ter Heide et all., (2017); this study is based on describing the beliefs of refugees: the more pronounced posttraumatic stress disorder (PTSD) is, the more negative the basic beliefs subscales ("Benevolence of World", "Benevolence of People" and "Luck") become (ter Heide et al., 2017).

In this way, the theoretical analysis carried out shows the connection of such basic beliefs as axiological basis, personal assessment of oneself and other people, world in general with psychological well-being of each person. Why do we suppose the basic beliefs and psychological well-being to be correlated with cognitive and style features? Why do some people have a pronounced sense of injustice, making them perceive and assess the world and life in a negative way, interfering with their psychological well-being (according to Monden et al., 2016)? One can assume that the global views of life and their subsequent impact on well-being are based on human's intellectual abilities: the better constructive thinking is developed, the more it correlates with success in work, love, in social relationships, and in maintaining emotional and physical well-being (Epstein and Meier, 1989). Self-refraction, emotional regulation, cognitive control (which are provided by neural networks dynamic interaction), lie at the root of psychological well-being and play an important role in human being successful in work, social relationships and health activities. The higher the mental adaptability and information correlations flexibility are, the higher the level of human's well-being is (Shi, et al, 2018).

Conceptual skills are the core ones among all the intellectual abilities; these skills are mental qualities able to produce some new content absent in actual circumstances or in absorbed basic knowledge. Conceptual skills allow the person to manage own resources (predict their consumption and "recover" them, assess the resources effective using) as well as to open up new resources and opportunities by conceptualizing (categorizing, explaining, interpreting, etc.) of what is happening. (Khazova, 2014., p.17). Conceptualizing

skills play a great role in a system of mental resources: they provide correct cognitive assessment of the actual situation, allow finding new ways of facing the challenges and coping with difficult life situations, help to create and attract new resources, as well as to give resource value to personal mental abilities and objects of external environment (Kholodnaya and Khazova, 2017).

The cognitive system functions through personal and social relationships assessment, as well as through the attitude of the persons towards themselves. E.g., feedback information about success in work from the social environment can lead to a reduction of selfesteem (Khazova, 2014). There are many proves nowadays that the cognitive assessment influence the outcome of situations as well as the person's condition and feelings do. Some researchers (Iani et al., 2017) note that the way a person assesses different situations may be more important for psychological well-being than the actual presence of stress. Cognitive assessment is of great importance in overcoming distressing situations as it defines how the situation is perceived, estimated and evaluated, i.e. acts as a so called "guide" between the situation (event) and the outcome (Iani et al., 2017; Kevereski at al., 2016). Cognitive interpretation of the situation as being "stressful" is crucial for assessing, explaining events and finding the strategies of solving the problems. The worse a person sees the situation (as stressful or threatening), the worse his/her adjustment to this situation is, the less correct strategies to solve the problem a person finds (Roesch et al., 2002).

It has also been found that mindfulness as a cognitive function of intellectual activity is positively correlated with such psychological well-being features as personal growth, having a goal in life, autonomy (Iani et al., 2017). The role of cognitive assessment is also of great importance for coping strategies: problem distancing/avoiding or solving. The respondents who assessed their difficulties (family issues were studied) as threatening to their resources were more likely to use the distancing/avoiding coping strategy (Bouchard, 2003).

Thus, conceptualization process is one of the key resources; this process helps to make a differentiated and objective representation of a relevant situation (its characteristics) through the cognitive assessment as well as to estimate own opportunities in a realistic way. It can be stated that the main functions of conceptualization are cognitive assessment and a sense of a given period of life; effectiveness/ineffectiveness of life and a psychological well-being are the results of cognitive assessment (Kholodnaya and Khazova, 2017).

As well it should be mentioned that not all people having well-developed intellectual resources and abilities use the conceptualization process in different life situations and circumstances correctly. Correct conceptualization process is driven and conditioned by prevailing cognitive styles as well as the ideas of a human about the essence and the nature of own intelligence and personality (mental representations) (Pavlova and Kornilova, 2019; Khazova, 2014; Azeska, Starc, Kevereski and 2017).

Khazova, considered in her study (Khazova, 2014) the influence of mental activity cognitive and style characteristics on intellectual activity as well as on life in general. Cognitive styles are unique, specific and sustainable ways of information and gained experience processing through peculiar differences in percepting, analyzing, structuring, categorizing and reality assessing (Kholodnaya, 2019). Different cognitive styles: cognitive control field dependence/independence, flexibility/rigidity, analytical/synthetical character, reflexivity/impulsiveness (Khazova, 2014) determine the level of subjective control and leadership qualities, human's ability to assess internal world as well as the ability to make realistic prognoses, independent choices. However, the exact cognitive and style characteristics and their peculiar connections and correlations with subjective well-being are insufficiently studied yet.

2. MATERIALS AND METHODS

The following methods and techniques were used to define the models of cognitive and style predictors and basic beliefs:

1. The "Cognitive styles of a person's individuality" questionnaire (Rusalov V.M. Volkova, E.V.) aimed at defining independent variables (cognitive styles): cognitive control field dependence/independence, flexibility/rigidity, analytical/synthetical character, etc.;
2. The scales of psychological well-being (Carol D. Ryff) were aimed at defining first group of dependent variables: autonomy, environmental mastery, personal growth, aim in life, etc.;
3. World assumptions scale (WAS) (R.

Janoff-Bulman) helped to pick out the second group of variables: benevolence of the world, meaningfulness of the world and self-worth;

4. Multivariate regression analysis, specifically "Stepwise" method, was used to explain the psychological well-being and basic beliefs variables behaviour through models;

The stepwise criterion (F inclusion probability is p≤ 0.050, F exclusion probability is >= 0.100) was used.

The models analysis criteria are as follows: dependent variables indices are the signs of a specifically expressed regression: "0,1 – 0,3" - weak; "0,3-0,5" - moderate; "0,5-0,7" - remarkable; "0,7-0,9" - strong; "0,9-1" - very strong; absolute term of regression is a sign of the result (psychological well-being and basic beliefs variables) in case if all indices-factors (cognitive styles) are equal to zero.

Two hundred seventy four students (19-23 years old) of the Southern Federal University took part in the research. The average age of the respondents was 20 years old. 50.5 percent male and 49.5 percent female students.

3. RESULTS

Seven cognitive and style models of psychological well-being (PWB) were studied at the first step of the research (Table 1).

1st PWB model:

*Positive relations with others = 51.639 + 0.563*CS ("cognitive style") "Rigidity" (R).*

The components are defined at the following significance levels: p≤0.000; 0.027. Predictors of the positive relations with others: constant; cognitive style "Rigidity".

2nd PWB model:

*Autonomy = 44.835 + 0.702*CS "Being intolerant to unrealistic experience"(BI) + 0,697*CS "Being tolerant to unrealistic experience"(BT) .*

The components are defined at the significance levels: p≤0.000; 0.005; 0,005. Such cognitive style as "Being intolerant to unrealistic experience" is of great significance in this model. The following predictors of autonomy are defined: constant, cognitive styles "Being intolerant to unrealistic experience" and "Being tolerant to unrealistic experience"; these styles intercommunicate and influence the dependent variables.

3rd PWB model:

*Environmental mastery = 43.529 + 0.273*CS "Field dependence"(FD) + 0.118*CS "Being intolerant to unrealistic experience" (BI).*

The components are defined at the following significance levels: p≤0.000; 0.000; 0,043. Environmental mastery predictors are as follows: constant; "Field dependence" and "Being intolerant to unrealistic experience". "Field dependence" is of greater significance in this model.

4th PWB model:

*Personal growth = 43.376 + 0.236*CS "Being tolerant to unrealistic experience" (BT).*

The components are defined at the following significance levels: p≤0.000; 0.000. Personal growth predictors: constant and cognitive style "Being tolerant to unrealistic experience".

5*th* PWB model:

*Life goals = 38.088 + 0.288*CS "Field independence"(FI) + 0.283*CS "Being tolerant to unrealistic experience" (BT).*

The components are defined at the significance levels: p≤0.000; 0.000; 0,018. Life goals predictors are constant, cognitive styles "Field dependence" and "Being tolerant to unrealistic experience". The styles mentioned above are interrelated and influence the dependent variables; "Field independence" cognitive style has a great sway in this very model.

6th SWB model:

*Self-acceptance = 46.317 + 0,782*CS "Field independence" (FI).*

Significance levels: p≤0.000; 0.003. Self-acceptance predictors: constant and "Field independence".

7th SWB model:

*Psychological well-being = 272.990 + 0.206*CS "Field independence"(FI) + 0.141*CS "Being tolerant to unrealistic experience" (BI).*

Significance levels: p≤0.000; 0.001; 0,019. Psychological well-being predictors: constant; cognitive styles "Field independence" and "Being tolerant to unrealistic experience". The styles mentioned above intercommunicate and influence the dependent variables; but the "Field independence" cognitive style prevails in this very model.

Consequently, the first step of the research helped to define 7 models out of 7 possible ones (i.e. 100 percent) by using multivariate regression analysis. This fact allow characterizing cognitive and style predictors of psychological well-being in a multidimensional way.

Table 1. Style predictors ratio (PBW models)

Models	Cognitive styles (CS)				
	Rig	BT	BI	FD	FI
PWB1	0,563	-	-	-	-
PWB2	-	0,697	0,702	-	-
PWB3	-	-	0,118	0,273	-
PWB4	-	0,236	-	-	-
PWB 5	-	0,283	-	-	0,288
PWB 6	-	-	-	-	0,782
PWB 7	-	-	0,141	-	0,206

The results of the second step of the research (10 cognitive and style models of the basic beliefs (BB) characteristics) are as follows (Table 2):

1st BB model:

*Benevolence of the world (BW) = 2.654 + 0.235*CS "Flexibility"(F) + 0.129*CS "Field dependence"(FD) + 0.125*CS "Concrete conceptualization"(CC).*

The components are defined at the following significance levels: p≤0.000; 0.000; 0,028; 0,033. Benevolence predictors are as follows: constant; such cognitive styles as "Flexibility", "Field dependence", "Actual conceptualization". "Flexibility" cognitive style predominates over two other ones.

2nd BB model:

*Benevolence of people (BP) = 2.807 + 0.230*CS "Field dependence"(FD) + 0.121*CS "Flexibility" (F).*

The components are defined at the following significance levels: p≤0.000; 0.000; 0,041. BP predictors are as follows: constant; "Field dependence" and "Flexibility" cognitive styles. "Field dependence" has greater influence here than "Flexibility".

3rd BB model:

*Just of the world (J) = 2.158 - 0.176*CS "Impulsiveness"(I) + 0.174*CS "Flexibility"(F) + 0.143*CS "Being intolerant to unrealistic experience"(BI).*

The following significance levels are analyzed: p≤0.000; 0.005; 0,003; 0,016. Just predictors are as follows: constant; such cognitive styles as "Flexibility", "Being intolerant to unrealistic experience" as well as "Impulsiveness" having feedback link with the other styles and predominating over them in this model.

4th BB regression model:

*World Controllability (C) = 3,094 + 0.132*CS "Abstract conceptualization"(AC) + 0.131*CS "Concrete conceptualization"(CC)*

The following significance levels are defined: p≤0,000: 0,029; 0,031. Control predictors are the following ones: such cognitive styles as "Abstract conceptualization" and "Concrete conceptualization".

5th BB regression model:

*Self-worth (SW) = 2.541 + 0,126*CS "Abstract conceptualization"(AC) + 0,182*CS "Impulsiveness"(I) - 0.186*CS "Rigidity"(Rig)+ 0.161*CS "Field independence" (FI).*

The components of the model are defined at the following significance levels: p≤0,000: 0.045; 0,002; 0,001; 0,008. The SW predictors set is as follows: constant; such cognitive styles as "Abstract conceptualization", "Impulsiveness", "Rigidity" (with the feedback link), "Field independence".

6th BB model:

*Self-control (SC) = 3.252 + 0.249*CS "Reflexivity"(R) + 0.122*CS "Abstract conceptualization"(AC) - 0,144*CS "Rigidity"(Rig) + 0.125*CS "Field independence"(FI).*

The following significance levels are defined in this model: p≤0.000; 0.000; 0,028; 0,033. Self-control predictors: "Reflexivity", "Abstract conceptualization", "Field independence" as well as "Rigidity" (cognitive style with a feedback link).

7th BB model

*Luck (L) = 3.785 - 0.215*CS "Rigidity"(Rig) + 0,150*CS "Being tolerant to unrealistic experience"(BT).*

The components of the model are defined at the following levels: p≤0.000; 0.000; 0,011. Luck predictors are "Rigidity" (cognitive style with a feedback link) and "Being tolerant to unrealistic experience".

8th BB model:

*Attitude to the benevolence of the world = 2.613 +0.193*CS "Flexibility"(F) + 0.185*CS "Field dependence"(FD) + 0.115*CS "Being tolerant to unrealistic experience"(BT).*

The components of this model are as follows: p≤0.000; 0.001; 0,002: 0,050. The group of interrelated predictors is obtained as a result of this model analyzing; these predictors have an influence on dependent variable and include such cognitive styles as "Flexibility", "Field dependence", "Being tolerant to unrealistic experience".

9th BB model:

*General attitude to the sense of life = 3.319 + 0.162*CS "Impulsiveness"(I) - 0,181*CS "Rigidity"(Rig) + 0.156*CS "Flexibility"(F) + 0,159*CS "Being tolerant*

to unrealistic experience" (BT).

The components are defined at the following significance levels: p≤0.000; 0.008; 0,002; 0,007; 0,009. The general attitude predictors are as follows: "Impulsiveness", "Rigidity" (cognitive style with a feedback link), "Flexibility" and "Being tolerant to unrealistic experience"; these styles correlate and have an effect on the "General attitude" variable.

10th BB model:

Sense of self-worth = 7.878 - 0.206*CS "Rigidity"(Rig) + 0.243*CS "Abstract conceptualization"(AC) + 0.287*CS "Reflexivity" + 0,260 *CS "Field dependence"(FD).*

The components of the model are defined at the following significance levels: p≤0.000; 0.019; 0.021; 0.013; 0.026. The following group of predictors characterizes the 10th model: "Rigidity" (cognitive style with a feedback link), "Abstract conceptualization", "Reflexivity" and "Field dependence".

In view of this, 10 models (90.9 percent) out of 11 possible were defined at this step of the research. These results are a good proof of hypotheses on the basic beliefs cognitive style predictors. Only 11th model did not include any variables. This was an effect of defining the predictors in a field of cognitive styles of "Randomness" variable.

Table 2. Style predictors ratio (BB models)

Models	Cognitive styles (CS)				
	R	I	F	AC	Rig
BB1	-	-	0,235	-	-
BB2	-	-	0,121	-	-
BB3	-	-0,176	0,174	-	-
BB4	-			0,132	-
BB5	-	0,182	-	0,126	-0,186
BB6	0,249	-	-	0,122	-0,144
BB7	-	-	-	-	-0,125
BB8	-	-	0,193	-	-
BB9	-	0,162	0,156	-	-0,181
BB10	-	-		0,243	-0,206

Table 2. Style predictors ratio (BB models). Continuation

Models	Cognitive styles (CS)				
	FD	FI	BT	CC	BI
BB1	0,129	-	-	0,125	-
BB2	0,23	-	-	-	-
BB3	-	-	-	-	0,143
BB4	-	-	-	0,131	-
BB5	-	0,161	-	-	-
BB6	-	0,125	-	-	-
BB7	-	-	0,15	-	-
BB8	0,185	-	0,115	-	-
BB9	-	-	0,159	-	-
BB10	0,26	-	-	-	-

4. DISCUSSIONS

Analysis of the *first step* of the research showed that the models of psychological well-being and basic beliefs cognitive and style predictors are characterized by some peculiarities. Two groups of models are defined by categorization on the first step.

First group is notionally called "harmonic" predictors models (4 models in total – 57.14 percent) of personal growth, purposes in life, self-acceptance and psychological well-being (PWB4, PWB5, PWB6, PWB7). These models definition is quite coherent with some actual researchers' studies, pointing out that the cognitive assessment is in some sense an intermediate between the experience and the result (Kholodnaya, 2019; Khazova, 2014; Oliver and Brough, 2002). These models are characterized by the cognitive style efficiency; this effect, in M.A. Kholodnaya's opinion, means that such cognitive style pole as "Field independence" can have an influence on productive aspects of activity (Kholodnaya, 2019).

In particular, it has been found that two variables act as the purposes in life (PWB5 group) predictors: first of them is "Field independence", reflecting the control strategies correct formation and usage for information processing; these control strategies are aimed at checking the visible field impact on the process and to define the purpose in life. The second predictor is "Being tolerant to unrealistic experience" expressing the ability to receive information not corresponding to the attitudes already formed and to take it into account while determining the life purposes. The received result correlates to the self-control individual style researches (Bolotova and Puretskiy, 2015); these researches show that the "field independent" persons are

characterized by the higher level of self-control while planning, analyzing the aims of activity, modelling significant conditions and programming their activity than the "field dependent" ones. "Field independent" persons have more resources for exact situation regulating and managing (Padun, 2009). The model explains the reasons of young persons' poorly-developed (or undeveloped) vision of the future: they may have an insufficiently developed "Field dependence" and "Being tolerant to unrealistic experience" resources.

It has been found out that the "Field independence" coupled with the "Being tolerant to unrealistic experience" (PWB7 model) are the predictors of psychological well-being acting as an integral state of personality. It can be assumed that the perfect implementation of personal resources and abilities aimed at achieving the result, success and happiness, as well as the degree of these resources and abilities realization, is connected with the person's ability to use control strategies for information processing, to be resistant to various unusual and unexpected information.

An important result of the research is the identification of the personal growth predictor (PWB4 model). It is found out that "Being tolerant to unrealistic experience" (being resistant to new impressions not corresponding to the already existing ones and the possibility of their adoption) is the main driving force contributing to the new experience obtaining openness, sense of own potential realization and changes in accordance with own knowledge and achievements. It can be said that the young people, characterized by an advanced metacognitive assessment and control, have a high potential for personal growth.

Self-acceptance (as a positive assessment of own past experience, positive attitude towards oneself, understanding and acceptance of oneself various sides, including good and bad qualities) is determined by correct control strategies formating and using for information processing, ability to assess one's talents and capabilities objectively (i.e. "Field dependence") (PWB6 model). The result is also quite logical: the more a person is oriented to an objective and accurate assessment of own capabilities, the more the person is inclined to accept oneself and all own skills.

The *second group* of the defined models, notionally called "ambivalent" includes 3 models (42.86 percent) of "positive relations with others" predictors, autonomies and environment management. The name of the group is driven by the influence of ambivalent style pair tolerance/intolerance, rigidity, field dependence and intolerance to unrealistic experience on psychological well-being criteria.

So it has been found that the cognitive style "Rigidity" is a predictor of a positive relationship with others (PWB1 model). There is an opinion (Yashin, 2015) that rigid thinking correlates with human sociability being quite successful. The person characterized by this cognitive style is easier to interact with people in some situations due to the fact that cognitive control rigidity gives an advantage in speed and stability of motor reactions, as well as in subjective confidence; but this process is carried out by more superficial analysis of the current events (Volkova and Gusev, 2016). Meanwhile, people with the same cognitive style find common ground quickly and are more likable, which can also confirm our hypothesis (if persons entering the human relationship system are characterized by rigidity) (Korchin, 1986).

It has also been found out that despite the reflective style high (its value is 6.83 out of 25 possible) potential, the predictors of the students' environment control include the following cognitive styles: "Field dependence", reflecting the control strategies being not formed or incorrectly used in a process of information processing as well as the attention organization faults and its static character; "Being intolerant to unrealistic experience" (resistance to the surrounding reality) (PWB3 model). It can be supposed that the will to power and manage the environment (being a control strategy in relations with people) acts as some compensation for the lack of control cognitive strategies.

Having analyzed the second group of models we can assume that the students are at the so called crucial point of the styles (methods) of analyzing and assessing the surrounding world and its conditions, information processing and structuring, getting an experience in their psychological well-being assessment formation and use. This assumption is logically consistent with the fact that all 7 models contain an absolute term indicative of other factors not considered in the models. Nevertheless, the "ambivalent" group of models, identified in the study, requires further research.

The analysis of the second research step results includes the models of cognitive styles

influencing the students' basic beliefs. Three groups of models were defined thanks to the analysis results categorizing.

The first group of predictors, notionally called "harmonic", includes only 2 models: BB6 and BB7 – 20 percent. These models are characterized by the cognitive styles efficiency, which, according to Kholodnaya M.A., on the one hand, allows obtaining direct evidence of the style criteria being connected with the self-control and luck degrees evaluation indices. On the other hand, scientific facts indicate that such cognitive style poles as "Field independence", "Reflexivity" and "Abstract conceptualization" directly influence the success and efficient aspects of basic beliefs (Kholodnaya and Volkova, 2016).

For example, it is found out that the feedback "Rigidity" and directly correlated "Being tolerant to unrealistic experience" (BB7 model) are the predictors of luck (L) degree assessment. This correlation indicates an ease of changing from verbal functions to sensitive-perceptive ones in a process of luck assessing. This fact is directly connected with "Being tolerant to unrealistic experience", i.e. being tolerant and patient to unexpected "unusual" events (such as luck/fortune). It can be assumed that the less the thinking rigidity and the more the tolerance to unexpected experience are expressed, the more positively a person estimates the events going on from the point of view of luck and success.

The second group (4 models - 40%), notionally named the models "tending to harmonize", include: self-worth (BB5), attitude to benevolence of the world (BB8), attitude to sense of the world (BB9), sense of self-worth (BB10). The models include predominating cognitive style poles ("Field independence", "Reflexivity", "Abstract conceptualization") making the activity efficient; and specific style poles ("Impulsiveness", "Rigidity", "Field dependence") having no effect as the predominating poles do.

In particular, the system of self-worth predictors includes a contradictory element ("Impulsiveness") in addition to sufficiently harmonious styles ("Abstract conceptualization", "Field independence" and a feedback "Rigidity"). In other words, persons' positive self-assessment, own skills and character features estimation are determined by the high level of the concepts differentiation and integration within the individual conceptual system; by subjective experience organization and by control strategies being formed and correctly used for information (connected with the "self-worth" notion) processing. It can also be said that people tending to reduce rigid control, to reduce difficulty in changing from verbal to sensitive-perceptive functions; who are able to be attentive regarding changes in their individuality are characterized by a rather high development of self-worth predictors. At the same time, what calls attention to itself is the following cognitive style as "Impulsiveness" (ability to respond to a problem quickly, to put forward and analyze hypotheses without fletcherizing) being included into the model. That is why this style is discordant with two other ones. It can be said that students react some subjectively important situations (connected with own personality assessment, self-worth) emotionally and this reaction can be impulsive.

It should be noted as well that such styles as "Flexibility" and "Being tolerant to unrealistic experience" appear in the models consistently. I.e., flexible style and control connected with "Being tolerant to unrealistic experience" and decreased "Rigidity" (feedback) are also the predictors of the world sense persuasion (BB9 model). However, this connection is also complemented by the "Impulsiveness" cognitive style, which is a leading factor, reflecting the tendency of students to respond to a problem quickly without fletcherizing it. It can be assumed that the basic belief of the world being filled with meaning and sense, that all events are non-accidental (they are controlled and are subject to the laws of justice) is based on the ability to subjectively easy changing the ways of information processing in a situation of cognitive conflict, on the resistance to unexpected or unusual information (on the ability to process this information) and on the fast cognitive information processing (it does not always affect the decisions accuracy and correctness negatively). At the same time, the "Rigidity" (having feedback link) index decrease proves the sufficient stability of tolerance criterion and the neuroticism level decrease (Padun, 2009), which contribute to subjective acceptance of the world as being meaningful and controlled.

The *third defined group* consists of four (40%) "ambivalent" models: benevolence of the world (BB1), benevolence of people (BB2), just of the world (BB3), control (BB4).

Such cognitive style poles as "Field dependence", "Concrete conceptualization", "Being intolerant to unrealistic experience" are dominant in this model; the higher these

poles values are, the less efficient the wide range of variables is. "Flexibility" and "Abstract conceptualization" cognitive style poles, causing activity efficiency are at the same time included into the correlations of predictors.

In particular, it became apparent that the predictors of the benevolence of the world persuasion include three cognitive styles; "Flexibility" has more influence than other cognitive styles and reflects active and passive cognitive activity regulation in the course of own opinion assessing. This style is correlated with "Field dependence" as well as with "Actual conceptualization". This correlation reflects the simplicity (specificity) of personal designs, the gaps of conceptual thinking, the benevolence of the world conceptualizing and predicting assessment on the basis of own experience. This cognitively simple world understanding may probably give a person an opportunity to perceive and accept the world in a favourable way, easily coping with any challenges (having no problems with the events interpretation) (Padun, 2009).

The similar tendency is found out in the model of benevolence of people predictors: such cognitive styles as "Field dependence" and "Flexibility" (facility with changing from verbal to sensitive-perceptive functions) lead to believing in benevolence of people and socializing thanks to cognitively simple view of these factors.

The results defined in this (ambivalent) group of models require further research.

5. CONCLUSIONS

The research showed that the cognitive styles are a specific form of reality cognitive assessment; these styles are the predictors of the students' psychological well-being and basic beliefs. The research theoretically proves the students' psychological well-being being correlated with basic beliefs; 12 (100 percent) out of 12 possible cognitive style poles are included into the models; these facts help to make an overview of the psychological well-being and basic beliefs style predictors.

The number of identified models of the students' psychological well-being and basic beliefs style predictors is 17 out of 18 hypothetic ones (94.4 percent); this quantity proves that the subject of the research is well-analyzed. One model of predictors ("accidental" variable) did not include any style pole while making the equation. This fact can be caused by some uncontrolled and inestimable random factor, existing in each system.

The following groups of models (reflecting cognitive styles mobility and efficiency) were defined in a process of the students' psychological well-being and basic beliefs predictors categorizing:

- "harmonic" predictors models, including efficient cognitive styles, giving direct evidence of style criteria being connected and correlated with the psychological well-being and basic beliefs. These models include such predictors as "Field independence", "Reflexivity", "Abstract conceptualization", "Flexibility";
- models "tending to harmonize" are characterized by domination of the cognitive style poles, specifying the activity efficiency, but as well include specific style poles ("Impulsiveness", "Rigidity", "Field dependence") which do not determine the activity;
- "ambivalent" models are characterized by domination of such cognitive style poles as "Field dependence", "Concrete conceptualization", "Being intolerant to unrealistic experience"; if the rates increase, the poles' efficacy lowers. However, separate cognitive style poles ("Flexibility" and "Abstract conceptualization") are included into this group of models; these poles determine the activity efficiency.

Such persistent predictors (degree of incidence is ≥3) of the psychological well-being as "Field independence" and "Being tolerant to unrealistic experience" are defined during the empirical research and have an impact on students' personal growth, purposes in life, self-acceptance and psychological well-being in general.

On the one hand, "Flexibility", "Abstract conceptualization", "Field independence" and "Rigidity" (having feedback link) are the basic persistent predictors of the students' basic beliefs; on the other hand, "Field dependence" while correlating with "Field independence" establishes a new resource; if this resource is flexibly used, it can become a key factor to effective involuntary intellectual control (Kholodnaya, 2019; Padun, 2009). Moreover, "Field dependence" is connected with the age-specific rate; this fact leads to the "Field independence" rate decline among students (the rates of the "Field independence" are maximally expressed during the teenage and early adolescent periods).

"Reflexivity" and "Impulsiveness"

appear in the models infrequently; this fact, in our opinion, reflects the tendency of "Impulsiveness" changing to "Reflexivity" in a process of the psychological well-being and basic beliefs cognitive assessment.

Cognitive styles functioning as the students' psychological well-being and basic beliefs predictors open the potential for their meta-cognitive regulation and assessment; but only further investigations will help to explain some models defined during the present research.

ACKNOWLEDGEMENTS

We would like to express our gratitude to Dr. Alla Belousova for consulting and collaborating with us during our writing the article.

We greatly appreciate the International contribution of the Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE) and contribution of the Psychology and Life Safety department staff as well as our colleagues from the Institute of Computer Technologies and Information Safety of the Southern Federal University in realizing the ideas pointed out in our article.

Conflict of interests

The authors declare no conflict of interest.

REFERENCES

Azeska A., Starc J., & Kevereski L. (2017). Styles of decision making and management and dimensions of personality of school principals. *International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE), 5(2)*, 47-56. https://doi.org/10.5937/IJCRSEE1702047A

Belykh T. V., Grishina N. P., & Zinchenko E. M. (2018) Decision-making at different levels of rationality: subjects's cognitive, neural and psycho-dynamic characteristics. *International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE), 6(1),* 39-44. https://doi.org/10.5937/ijcrsee1801039B

Bolotova, A. K., & Puretskiy, M. M. (2015). Развитие идей саморегуляции в исторической ретроспективе [Development of self-control ideas through historical perspective], *Cultural and historical Psychology, 11(3),* 64-74. https://doi.org/10.17759/chp.2015110306

Bono, G., McCullough, M. E., & Root, L.&M. (2008). Forgiveness, feeling connected to others, and well-being: Two longitudinal studies. *Personality and Social Psychology Bulletin, 34(2)*, 182-195. https://doi.org/10.1177/0146167207310025

Bouchard, G. (2003). Cognitive appraisals, neuroticism, and openness as correlates of coping strategies: An integrative model of adaptation to marital difficulties. *Canadian Journal of Behavioural Science, 35(1)*, 1-12. https://doi.org/10.1037/h0087181

Carnelley, K.B., & Janoff-Bulman, R. (1992) Optimism about love relationships: general vs specific lessons from ones personal experiences. *Journal of Social and Personal Relationships, 9(1),* 5-20. https://doi.org/10.1177/0265407592091001

Diener, E., & Ryan, K. (2009). Subjective well-being: a general overview. *South African Journal of Psychology, 39,* 391-406. https://doi.org/10.1177/008124630903900402

Dzuka J., & Dalbert C. (2006). The belief in a just world and subjective well-being in old age. *Aging and Mental Health, 10(5)*, 439-444. https://doi.org/10.1080/13607860600637778

Emmons, R. (2004). *Психология высших устремлений: мотивация и духовность личности* [Psychology of ultimate concerns: personality motivation and spirituality] Moscow: Smysl Publ, 414. https://www.elibrary.ru/item.asp?id=20075867

Epstein, S., & Meier, P. (1989). Constructive Thinking: a broad coping variable with specific components. *Journal of Personality and Social Psychology, 57 (2)*, 332-350. https://doi.org/10.1037/0022-3514.57.2.332

Fini, A. A. S., Kavousian, J., Beigy, A., & Emami, M. (2010). Subjective vitality and its anticipating variables on students. *Procedia - Social and Behavioral Science, 5,* 150-156. https://doi.org/10.1016/j.sbspro.2010.07.064

Goldenberg, I., & Matheson, K. (2005) Inner representations, coping, and posttraumatic stress symptomatology in a community sample of trauma survivors. *Basic and Applied Social Psychology, 27(4)*, 361-369. https://doi.org/10.1207/s15324834basp2704_9

Horvath, P. (2018). The relationship of psychological construals with well-being. *New ideas in psychology, 51,* 15-20. https://doi.org/10.1016/j.newideapsych.2018.04.008

Iani, L., Lauriola, M., Cafaro, V., & Didonna, F. (2017) Dimensions of Mindfulness and Their Relations with Psychological Well-Being and Neuroticism. *Mindfulness 8(3)*, 664-676 https://doi.org/10.1007/s12671-016-0645-2

Jackson, H., & MacLeod, A. K. (2017). Well-being in Chronic Fatigue Syndrome: Relationship to Symptoms and Psychological Distress. *Clinical Psychology and Psychotherapy, 24(4)*, 859-869. https://doi.org/10.1002/cpp.2051

Kern, M. L., Waters, L. E., Adler, A., & White, M. A. (2015). A multidimensional approach to measuring well-being in students: Application of the PERMA framework. *Journal of Positive Psychology, 10(3),* 262-271 https://doi.org/10.1080/17439760.2014.936962

Kevereski L., Kotevska Dimovska M., & Ristevski D. (2016). The influence of the emotional inteligence in protection of the mental health in conditions of a psychosocial stress. *International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE), 4(1),* 17-21 https://doi.org/10.5937/IJCRSEE1601017K

Khazova, S. A. (2014). Ментальные ресурсы субъекта в разные возрастные периоды: дис. ... доктора психологических наук / Хазова Светлана

Абдурахмановна: 19.00.13 [Mental resources of a person in different age periods: thesis research… Khazova Svetlana Abdurakhmanovna, Psy.D., 19.00.13], Kostroma. https://rusneb.ru/catalog/000199_000009_005550721/

Kholodnaya M. A., & Volkova E. V. (2016). Conceptual structures, conceptual abilities and cognitive functioning efficiency: the ontological approach. *Procedia - Social and Behavioral Sciences,* 914-922. https://www.researchgate.net/publication/293804408_Conceptual_Structures_Conceptual_Abilities_and_Productivity_of_Cognitive_Functioning_The_Ontological_Approach1

Kholodnaya, M. A. (2015). Интеллект, креативность, обучаемость: ресурсный подход (о развитии идей В.Н. Дружинина) [Intelligence, creativity, teachability: resource-based view (V.N. Druzhinin's ideas development)] *Psychological journal, 36(5),* 5-14. https://www.elibrary.ru/item.asp?id=24376982

Kholodnaya, M. A. (2019). *Психология интеллекта. Парадоксы исследования* [Psychology of intelligence. Antinomies in research]. 3rd edition revised and enlarged. Series: author manual. Moscow: Yurait Publ. https://elibrary.ru/item.asp?id=36500433

Kholodnaya, M. A., & Khazova, S. A. (2017). Феномен концептуализации как основа продуктивности интеллектуальной деятельности и совладающего поведения [Conceptualization as the basis of intellectual activity and coping behaviour efficiency] / *Psychological journal, 38(5)*, 5-17. https://www.elibrary.ru/item.asp?id=29966416

Kopsov, I. (2019). A new model of subjective well-being. *Open Psychology Journal, 12(1),* 102-115. https://doi.org/10.2174/1874350101912010102

Korchin S. J. (1986). Field Dependence, Personality Theory, and Clinical Research // Field Dependence in Psychological Theory, Research, and Application // Eds.: M. Bertini, L. Pizzamiglio, & S. Wapner. Hillsdale: Lawrence Erlbaum Associates. https://doi.org/.4324/9781315825564

Krok, D. (2018). When is Meaning in Life Most Beneficial to Young People? Styles of Meaning in Life and Well-Being Among Late Adolescents. *Journal of Adult Development 25(2)*, 96-106. https://doi.org/10.1007/s10804-017-9280-y

Luhmann M., Hofman W., Eid M., & Lucas, R. E. (2012). Subjective Well-Being and Adaptation to Life Events: A Meta-Analysis. *Journal of Personality and Social Psychology, 102(3)*, 592-615. https://doi.org/10.1037/a0025948

Malkoç, A. (2011). Big five personality traits and coping styles predict subjective well-being: A study with a Turkish sample. *Procedia-Social and Behavioral Sciences, 12,* 577-581. https://doi.org/10.1016/j.sbspro.2011.02.070

Mason, N. L., Mischler, E., Uthaug, M. V., & Kuypers, K. P. C. (2019). Sub-Acute Effects of Psilocybin on Empathy, Creative Thinking, and Subjective Well-Being. *Journal of Psychoactive Drugs, 51(2),* 123-134. https://doi.org/10.1080/02791072.2019.1580804

Monden, K. R., Trost, Z., Scott, W., Bogart, K. R., & Driver, S. (2016). The unfairness of it all: Exploring the role of injustice appraisals in rehabilitation outcomes. *Rehabilitation Psychology, 61(1)*, 44-53. https://doi.org/10.1037/rep0000075

Oliver, J., & Brough, P. (2002). Cognitive appraisal, negative affectivity and psychological well-being. *New Zealand Journal of Psychology, 31(1)*, 2-7. https://www.researchgate.net/publication/29458153_Cognitive_appraisal_negative_affectivity_and_psychological_well-being

Padun, M. A. (2009). Когнитивный стиль и депрессия [Cognitive style and depression] *Experimental Psychology, 2(4),* 81–90. https://www.elibrary.ru/item.asp?id=13078606

Pavlova, E. M., & Kornilova, T. V. (2019). Триада «толерантность к неопределенности – эмоциональный интеллект – интуитивный стиль» и самооценка креативности у лиц творческих профессий [Trilogy "Ambiguity tolerance – emotional intelligence – intuitive (presentative) style" and art professionals creativity self-assessment] *Psychological and Pedagogical researches, 11(1)*, 107-117. https://doi.org/10.17759/psyedu.2019110109

Rasskazova, E. I., Yenikolopov, S. N., & Gul'dan, V. V. (2017). Оценка психологического благополучия как принятие решения: особенности субъективных критериев при психических заболеваниях (на моделях непсихотической депрессии и первого психотического приступа в юношеском возрасте) психология [Psychological well-being assessment as a process of decision making: subjective criteria peculiarities in case of psychiatric problems (using the models of non-psychotic depression and first psychotic episode in teenage period)] *Journal of the Higher school of Psychology, 14(2)*, 298-319. https://doi.org/10.17323/1813-8918-2017-2-298-319

Roesch, S. C., Weiner, B., & Vaughn, A. A. (2002). Cognitive approaches to stress and coping. *Current Opinion in Psychiatry, 15(6),* 627-632. https://doi.org/10.1097/00001504-200211000-00012

Ryff C. D. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology, 69*, 719-727. https://www.researchgate.net/publication/15726128_The_Structure_of_Psychological_Well-Being_Revisited

Savchenko, T. N., & Golovina, G. M. (2006). Субъективное качество жизни: подходы, методы оценки, прикладные исследования [Subjective quality of life: approaches, methods of assessment, applied researches] Moscow: Institute of Psychology of the Russian Academy of Sciences Publ. https://www.elibrary.ru/item.asp?id=22331803

Sheridan, Z., Boman, P., Mergler, A., & Furlong, M. J. (2015). Examining well-being, anxiety, and self-deception in university students. *Cogent Psychology, 2(1)*, 31. https://doi.org/10.1080/23311908.2014.993850

Shi, L., Sun, J., Wu, X., (...), Chen, H., & Qiu, J. (2018). Brain networks of happiness: Dynamic functional connectivity among the default, cognitive and salience networks relates to subjective well-being. *Social Cognitive and Affective Neuroscience, 13(8)*, 851-862. https://

doi.org/10.1093/scan/nsy059

ter Heide, F. J. J., Sleijpen, M., & van der Aa, N. (2017). Posttraumatic world assumptions among treatment-seeking refugees. *Transcultural Psychiatry, 54(5-6),* 824-839. https://doi.org/10.1177/1363461517741811

Volkova, N. N., & Gusev, A. N. (2016). Когнитивные стили: дискуссионные вопросы и проблемы изучения [Cognitive styles: Controversial issues and research problems]. *National Psychological Journal, 2,* 28-37. https://elibrary.ru/item.asp?id=27536968

Waterman, A. S. (2008). Reconsidering happiness: a eudaimonist's perspective. *Journal of Positive Psychology, 3,* 234-252. https://doi.org/10.1080/17439760802303002

Yashin, A. A. (2015). Когнитивная ригидность как фактор недостаточной успешности [Cognitive rigidity as a factor of an insufficient success]. *Psychology and Psychotechnics, (11),* 1146 - 1157. https://doi.org/10.7256/2070-8955.2015.11.16968

Załuski, M. (2015). Obraz Swiata Zawart Y W Dekl Aracjach Pol Icjantów Zakwalifikowanych Naleczenie Psychot Erapeutyczne [The worldview contained in declarations of police officers scheduled for psychotherapeutic treatment]. *Psychotherapy, (2),* 57-70. https://doi.org/10.12740/PT/42010

TRUST AS A COGNITIVE BASE OF SOCIAL COHESION IN THE UNIVERSITY COMMUNITIES

Dr. Marja Nesterova, Faculty of Management of Education and Science, National Pedagogical Dragomanov University, Kyiv, Ukraine, E-mail: marja@nesterova.com.ua
Dr. Maryna Dielini, Faculty of Agricultural Management, National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine, E-mail: marina.dielini@gmail.com
Dr. Lidia Shynkaruk, Faculty of Agricultural Management, National University of Life and Environmental Sciences of Ukraine. Kyiv, Ukraine, E-mail: lidia_shyn@ukr.net
Dr. Olena Yatsenko, Faculty of Management of Education and Science, National Pedagogical Dragomanov University, Kyiv, Ukraine, E-mail: yatsenkood@gmail.com

ARTICLE INFO

Original Research
Received: February, 06.2020.
Revised: March, 15.2020.
Accepted: March, 23.2020.
doi: 10.5937/IJCRSEE2001015N

UDK
316.454.4/.5(477)

Keywords:
cognitive base,
education,
social cohesion,
trust,
university community.

ABSTRACT

The present article continues the cycle of the cognitive researches of the phenomenon of social cohesion in education, in particular, in the university communities. It contains the cognitive research of trust and its foundation as the central focus of social cohesion. The purpose of the study is to identify the level of trust which is connected with the social cohesion in university communities, to test the author's questionnaire and to determinate the further steps for the trust enhancement in the educational community. Methods that were used in the study are the author's questionnaire, math analytics etc. There were 196 people interviewed in both universities, among them 31 employees and 85 students of the National Pedagogical Dragomanov University and 33 employees and 47 students of the National University of Life and Environmental Sciences of Ukraine. According to the research results, the level of trust in each university community (as well as in common) was average, excluding some indicators. Although there were some differences between levels of trust of employees of these universities. We can assume that the quite sufficient average level or trust positively characterizes the attitude of employees and students to each other, reflects their readiness for mutual respect and support, acceptance of differences and tolerance etc. Also, the research highlights weak points of social interactions that form the base for further investigations and actions on the social cohesion development.

1. INTRODUCTION

This article continues the long term investigations of the complex phenomenon of social cohesion, in particular in education, in the frame of Jean Monnet Module SCEGES (Social Cohesion in Education and Governance: European Studies) which is implementing (2017-2020) in the National Pedagogical University. The social cohesion is very important for education and social development accordingly. The social cohesion in education is one of the most perspective direction of social cohesion studies: EU Social Cohesion Policy, Social Cohesion Radar, Social Cohesion Model etc. (Dragolov et al., 2013). The authors research the cognitive mechanisms of the complex social cohesion phenomenon started in the previous research of social cohesion in the community of National Pedagogical Dragomanov University (Nesterova, Dielini and Zamozhskyi, 2019). The Research Centre of Cognitivistics has been established at the National Pedagogical Dragomanov University in 2015. The Centre has been managed by the rector of the university - Academician of Academy of Pedagogy Sciences of Ukraine, Prof. Victor Andrushchenko. Prof. Marja Nesterova is the head of the laboratory of social dimensions of cognitivistics. The concept of cognitivistics highlights the holistic unity of social and

Corresponding Author
Dr. Marja Nesterova, Faculty of Management of Education and Science, National Pedagogical Dragomanov University, Kyiv, Ukraine,
E-mail: marja@nesterova.com.ua

individual, rational and emotional, mind and body in the human cognitive system. Also in the focus of cognitivistics, there are cognitive mechanisms of social behaviour and their neurobiological, evolutionary bases (Nesterova, 2015).

At the moment these researches of social dimensions of cognitivistics are mainly focused on social cohesion as one of the most important social mechanisms. The Jean Monnet Module "Social Cohesion in Education and Governance: European Studies" (SCEGES) contains not only teaching courses regarding European Social Cohesion Policy and European practice of Social Cohesion in Education but cognitive researches which are conducted under the academic coordination of Prof. Marja Nesterova at the National Pedagogical Dragomanov University. These researches have a practical focus on social cohesion in educational communities (Holden, 2013; Healy, 2019; Sasson, 2019). One of them is the implementation of the Social Cohesion Model at the level of educational communities (Nesterova, Dielini and Zamozhskyi, 2019). At this research, the above Model has been implemented for the social cohesion management of the community of National Pedagogical Dragomanov University. This research reflects and proves the confident role of education in the social cohesion of communities. The authors of the research follow the demand for further investigations. "Thus, the social cohesion in education could be considered from the focus of own connectedness of university community" (Nesterova, Dielini and Zamozhskyi, 2019). We can suggest that the Social Cohesion Model by Bertelsmann Stiftung could be applied directly at the level of educational communities. The Social Cohesion Model has been applied in the university community of National Pedagogical Dragomanov University (Kyiv, Ukraine). The above research of social dimension of cognitive patterns of students and employees has been conducted in the university community to evaluate the real social cohesion level, which was not so confident in the National Pedagogical Dragomanov University. Therefore, the next investigations of the cognitive bases of social cohesion have to be provided (Nesterova, Dielini and Zamozhskyi, 2019).

The social cohesion as a social phenomenon is based on the set of individual and collective values, which help to integrate modern, diverse societies (Bachtler and Mendez, 2016; Healy, 2019). The modern education is based on the values too (Blum, 2014; Grierson, 2018; Healy, 2019). The common conclusion is that values are the drivers of human behaviour and they should occupy the significant space of all social innovations i.e. education, in particular (Social Cohesion and Education). These are the main principles of Values-based Education:

- "Values Consciousness" - thinking about and reflecting on values inside and outside the educational dimension and behaviour changes);
- "Wellbeing" - development of empathy and responsible personal behaviour;
- "Agency" - capacity to make choices, to act on them independently and to enact values in a real and deeply engaging way;
- "Connectedness" - through shared goals and practices in Values-based Education, which leads to the development of mutual feelings of respect, trust and safety; and varied opportunities for collaboration. (Values-Based Education).

One of the key values for social cohesion, concerned on "connectedness" (which is an often mentioned parameter of the social cohesion level) is trust as a not only key-value but a social phenomenon. The trust could be considered as a cognitive evolutionary mechanism of connectedness and cohesion in the various social groups. One of the definitions of social cohesion as a complex societal phenomenon includes "the level of trust and understanding of shared principles among groups in a society" (Roberts-Schweitzer, E., Greaney, V., and Duer, K, 2006). The Social Cohesion Model by Bertelsmann Stiftung also includes trust as main domains for the definition of social cohesion. Bertelsmann's approach marks trust in the right way in the main domains of the Social Cohesion Model. For this research authors focused on two domains - "Social Relations" and "Connectedness". The domain "Social Relations" includes trust in people and domain "Connectedness" includes trust in institutions (Dragolov et al., 2013).

So, the trust could be considered as the central element and cognitive base of social cohesion (Budnik, 2018). Without the ability to trust other people and institutions, as well as without understanding the need to justify the reasonable expectations of partners, effective social interaction is problematic.

2. MATERIALS AND METHODS

Our methodology continues and develops the Bertelsmann Stiftung Social Cohesion Model approach. The Model of Social Cohesion by Bertelsmann Stiftung consists of three domains of social cohesion and their respective dimensions. At the cognitive research of the social cohesion in education, which have been conducted in the National Pedagogical Dragomanov University, it has been investigated that trust is the most important and weak point of Social Cohesion Model (Nesterova, Dielini and Zamozhskyi, 2019). So, the original investigation is exactly focused on this important value and very important parameter of social behaviour at the same.

The description of the questionnaire is in Table 1.

Table 1. The dimensions of trust

Level of analytics	Category	Conceptualization
Functional (F)	Trust as the personal characteristic (TC)	Psychological tendency of a person to trust others.
	Trust to the close circle of colleagues (TCC)	Showing trust to those, with whom someone have good communication.
	Trust to the organization (TO)	Non-personalized manifestation of trust as attribution of belonging.
	Trust to the leaders (TL)	Trust, legitimized by the recognition of the particular typesetting of qualities.
Meaningful (M)	Contract trust (CT)	Trust as the investment-compensatory mechanism for social interaction.
	Communication trust (CmT)	Trust as the essential basis of effective communication.
	Competent trust (ComT)	Rationally-based form of trust.
	Moral and ethical trust (MET)	Trust as the accordance to the moral ideal and duty.
	Environmental trust (ET)	Trust as the precondition for the stability of the social system.

At this research we have analyzed the level of trust in the university communities of National Pedagogical Dragomanov University (NPDU) and National University of Life and Environmental Sciences (NULES): employees of the above universities (mostly lecturers) and students. The aim of the research is to identify the level of trust in the above communities and to mark the weak points in the domains of trust for further strengthening of it by appropriate training and other social and educational tools.

As we have mentioned earlier, the original methodology of the research and the questionnaire continue and develop the Bertelsmann Stiftung Social Cohesion Model on to the two important domains: "Social relations" and "Connectedness". Both domains contain various dimensions of trust. The "Social relations" domain covers trust in people and the "Connectedness" covers trust in institutions (Dragolov et al., 2013). So, we have continued the investigation of these domains from the Social Cohesion Model.

The subject of this study is the phenomenon of trust as one of the cognitive bases and fundamental components of social cohesion. The research methodology involves the differentiation of two levels of articulation of trust: functional (algorithms and techniques of implementation) and meaningful (procedures of understanding and interpretation). At the functional level, the phenomenon of trust is determined according to the destination of this activity: subjectivity, community, organization/institution, management. The meaningful level of trust shows different ways of its conceptualization. The differentiation of trust into contractual, communication and competent has been initiated by Reina, D. S. and Reina, M. L. (2007). However, these authors were convinced, that the content of trust is not limited by these motivation components.

Therefore, the understanding of trust as a moral, ethical, and environmental motivation of social relations we add to the previous considerations. So, contractual trust is a kind of investment-compensatory mechanism of social interaction, when the manifestation of trust is an advance for establishing emotional-positive relations; communication trust is intended for the process of information exchange; a competent kind of trust implies recognition of a partner's professionalism; the moral and ethical content of trust consists in recognizing it as value, as an example of good behavior; environmental interpretation of trust comes from understanding society as a system

that seeks for stability and balance, that is a society, in which to trust and to justify trust is appropriate, natural and rational. The main positions of this model are presented in the table.

We consider the functional level of trust in 4 directions: as the psychological quality of a person, as the confidence to colleagues, as faithful to the institution and as reliance on its management. Each of the directions is represented by 5 questions; in total there are 20 questions per block. So far as the level of practical implementation is more important for the study and diagnosis of social cohesion, more questions related to functionality. The meaningful level of trust we explore in the questionnaire with 5 questions, one for each of the varieties. This level is important more not for the diagnosis, but for further correction and impact activity in educational management.

The questionnaire has been prepared in accordance with the study of trust in society and has been adapted to the educational dimension. So, we aim to identify which functional and meaningful manifest of trust takes place in particular educational environments, and which components of trust are weak. In our case, we interviewed employees and students of the National Pedagogical Dragomanov University (Kyiv, Ukraine) and National University of Life and Environmental Sciences (NULES). The greater the level of trust in the working relationship, the greater the level of cohesion.

All 25 questions of the questionnaire are evaluated on a scale of 1 to 7, where 1 – "completely disagree", 2 – "disagree", 3 – "rather disagree", 4 – "difficult to answer", 5 – "rather agree", 6 – "agree", 7 – "strongly agree". The scale of evaluation of the results is divided into three levels: low, average and high degree of trust. According to the proposed options, the answers 1 "absolutely disagree" and 2 "disagree" show a low level of trust, options 3 "rather disagree", 4 "difficult to answer", 5 "rather agree" to the average level of trust, 6 "agree" and 7 "absolutely agree" show a high level of the respondents' trust. In reverse questions, the rating scale is inverse.

There were 196 people interviewed, among them 31 employees and 85 students of the National Pedagogical Dragomanov University; 33 employees and 47 students of the National University of Life and Environmental Sciences.

3. RESULTS

In continuation of our study of trust as a cognitive base of social cohesion, we present in Table 2 analysis of trust as its main component. The research has been conducted on 196 respondents.

The data have been analyzed using mean (average score) and standard deviation (σ). It allows to see the degree of deviation of the values from the average and evaluate the reliability of the results.

Table 2. Results of trust measure in the university community

Domains	Mean	Stand. deviation
Trust as the personal characteristic	4,35	1,25
Trust to the close circle of colleagues	4,75	1,30
Trust to the organization	4,69	1,50
Trust to the leaders	4,48	1,48
Functional	**4,57**	**0,16**
Contract trust	4,72	1,59
Communication trust	5,02	1,63
Competent trust	4,71	1,48
Moral and ethical trust	4,51	1,44
Environmental trust	4,91	1,49
Meaningful	**4,77**	**0,18**

According to the results of our research, we can see that on the whole, the level of trust in the university community is average, and almost all domains tend to the top measure of average. Every domain has the level more than 4,5 (except "Trust as the personal characteristic" – the average score of 4,35 and "Trust to the leaders" – the average score of 4,48). But in the case of "Communication trust" we have the higher value (the average score of 5,02). This means that respondents in the university community have an average level of trust. These values cover both analyzed universities - NDPU & NULES, and analyzed groups - employees and students.

As it was mentioned, the higher point has the domain "Communication trust". This result means that for the whole interviewed people this domain of trust is the main

motivation and the most important one. We have also received the high average point of the domain - "Environmental trust" (the average score of 4,91, which means that this form of trust is formed from the ecological attitude towards others and acceptance of it in return. Nowadays people understand the necessity of ecological behaviour and trust that others do the same as well.

We have analyzed the difference between "Meaningful" and "Functional" and concluded that "Meaningful" has the higher value (the average score of 4,77) than "Functional" (with the average score of 4,57), but this difference is not significant.

The least value of "Trust as the personal characteristic" means that representatives have such quality by their nature, by their subjectivity, without rational evaluation. The respondents less trust to others at a whole than to the close circle of colleagues or to the organization, or to the leaders.

The result of "Trust to the close circle of colleagues" (the average score of 4,75) shows that people trust their close colleagues more than the organization (the average score of 4,69) or leaders (the average score of 4,48).

But, despite the difference in results, we see that they all have the same level of trust – the average level.

The results of the measurement of the domains of trust in the university community are shown in Figure 1.

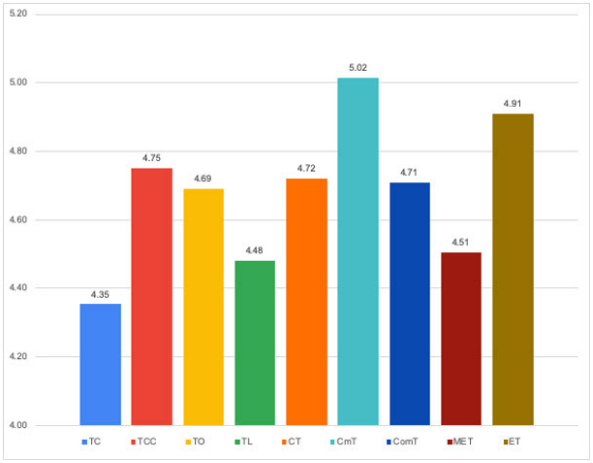

Figure 1. Results of trust in the university community by domains

To deepen our research, we have analyzed if there is a difference between groups of respondents. First of all, taking into account the specific of the educational sphere, we have investigated employees of both university (64 people) and students (132 people). It allows to make a conclusion about the difference in trust as a construct between this two groups.

The results of the research are presented in Table 3. As it is seen, there is no significant difference in results. For better data presentation see Figure 2.

Table 3. Results of the evaluation of the employees' and students' trust

	Employees		Students	
Domains	Mean	Stand. deviation	Mean	Stand. deviation
TC	4,50	1,28	4,28	1,23
TCC	4,96	1,18	4,65	1,35
TO	4,71	1,51	4,68	1,49
TL	4,81	1,44	4,32	1,47
Functional	**4,74**	**0,17**	**4,48**	**0,18**
CT	4,66	1,47	4,75	1,53
CmT	5,13	1,61	4,96	1,64
ComT	4,70	1,28	4,71	1,56
MET	4,41	1,42	4,55	1,45
ET	4,84	1,38	4,94	1,54
Meaningful	**4,75**	**0,24**	**4,78**	**0,15**

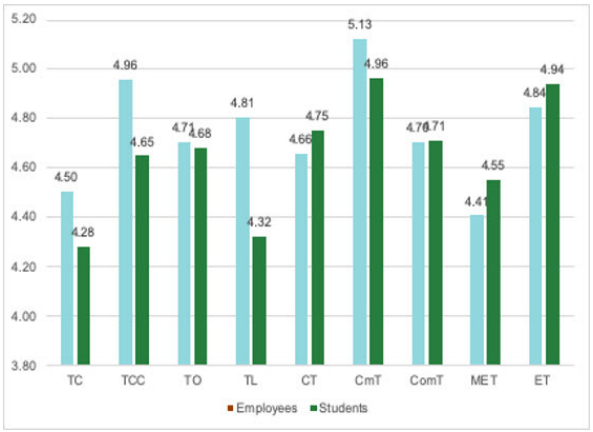

Figure 2. Comparison of social cohesion between all respondents and employees by dimensions

As it is shown in Table 3 and Figure 2, values for the analyzed groups are almost the same. All of them have an average level, except of "Competent trust" (with the average score of 5,13) of employees (mostly lecturers), that

is tend to top average of trust. It means that employees' trust depends on the competence of personality, whom they communicate with.

It is remarkable, that "Trust to the close circle of colleagues" and "Ecological trust" have higher results than others domains (the average score of 4,96, the average score of 4,84 respectively).

Also, we have analyzed students of NPDU and NULES and received almost the same results: all trust domains meanings are at the average level. At the same time, "Environmental Trust" is higher than its meanings for employees (the average scores of 4,94 and 4,84 accordingly). It reflects the importance of this area for students and their acceptance of this domain.

Figure 2 shows also the difference between employees' attitude to the "TCC" and students' lower value of this domain. As well as domain "TL" – the difference between them is almost 0,5. We suppose, that these results depend on the age of the interviewees and their perception of leaders or colleagues.

We have investigated, that for students are more important "CT" and "MET" domains (the average scores of 4,75 and 4,55 respectively). By employees, these domains meanings are at the lower level.

We have researched separately communities in the both universities. The first one was the NPDU. We have compared employees' and students' level of trust within this university community. The number of respondents was 116 (31 employees, 85 students).

The results are presented in Table 4 and Figure 3.

Table 4. Results of the measurement of employees' and students' trust in the university community of the NPDU

	Employees		Students	
Domains	Mean	Stand. devi-ation	Mean	Stand. devi-ation
TC	4,69	1,19	4,23	1,34
TCC	4,54	1,30	4,47	1,43
TO	4,15	1,50	4,62	1,69
TL	4,28	1,45	4,21	1,63
Functional	**4,42**	**0,20**	**4,38**	**0,17**
CT	4,45	1,52	4,79	1,69
CmT	4,39	1,47	4,98	1,85
ComT	4,68	1,38	4,79	1,70
MET	4,29	1,42	4,55	1,67
ET	4,68	1,40	5,06	1,68
Meaningful	**4,50**	**0,16**	**4,83**	**0,18**

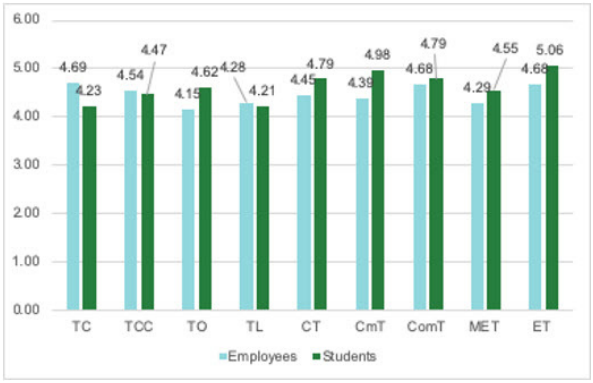

Figure 3. Comparison of employees' and students' trust in the university community of the NPDU.

We could observe that the values of trust domains are almost at the same level for each group of respondents in the NPDU. But we have to notice some key points:

1. For employees, there is more important the domain "TC" than for students (average scores of 4,69 and 4,23 respectively).
2. For students, it is more significant

"CT" (the average score of 4,98) and "ET" (the average score of 5,06), the last one has reached the higher point among others domains and can be characterized as the top average.

The results for the whole university community reflect the sufficient level of trust inside the university community that is tended to the top average in some domains.

We have investigated the evaluation of the level of trust in the NULES community as well. The results are presented in Table 5 and Figure 4.

Table 5. Results of the measurement of employees' and students' level of trust in the university community of NULES

	Employees		Students	
Domains	Mean	Stand. devi-ation	Mean	Stand. devi-ation
TC	4,98	1,19	4,37	0,99
TCC	5,36	1,30	4,97	1,11
TO	5,23	1,50	4,79	1,02
TL	5,30	1,45	4,52	1,10
Functional	**5,22**	**0,20**	**4,66**	**0,20**
CT	4,85	1,52	4,68	1,19
CmT	5,82	1,47	4,94	1,17
ComT	4,73	1,38	4,57	1,27
MET	4,52	1,42	4,55	0,92
ET	5,00	1,40	4,72	1,20
Meaningful	**4,98**	**0,45**	**4,69**	**0,14**

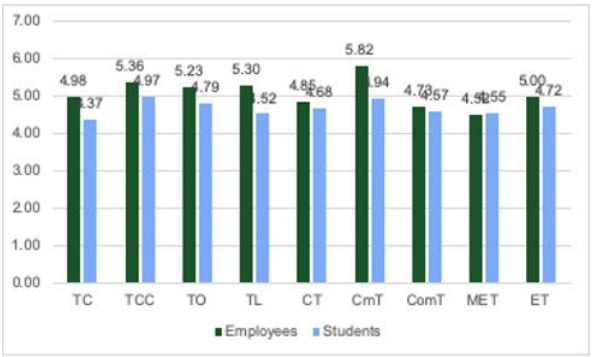

Figure 4. Comparison of employees' and students' trust in the university community of NULES

We have received quite different data for the NULES. There are more values which have higher points and we estimate them as top average level of trust.

Mostly it is concerned employees and functional group which average score is equal 5,22. That shows higher average level of trust to the colleagues, organization and leaders, as well as almost high level of "Communicative Trust" (average score of 5,82). That can be explained by their work specifics. Lecturers understand that communication is one of the tool of their efficient work, so they motivate to communicate as successful as possible.

We have researched students' level of trust. It is at the average level without any sufficient deviations.

Figures 5 and Figure 6 present the comparison of trust domains for all representative groups from both universities.

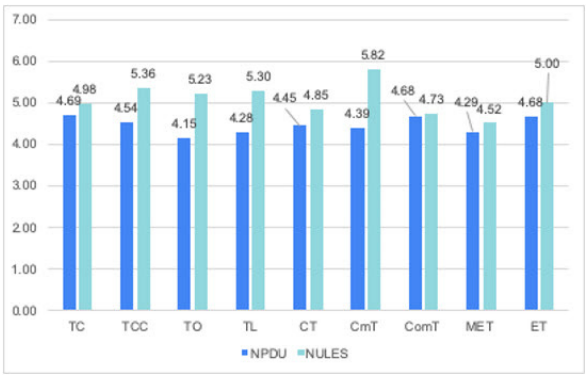

Figure 5. Comparison of trust domains between employees of the NPDU and the NULES

We have compared the results between employees of two universities and noticed that they had a little difference in values: NULES has one that is almost high level ("CT" with the average score of 5, 82 for the NULES against of the average score of 4,80 for the NPDU), some others ("TCC", "TO", "TL", "ET") are at the top average, and some of them at the same level as for the NPDU. On a whole, it has not been detected the significant difference between universities.

Figure 6 presents similar results, contrary to the previous figure.

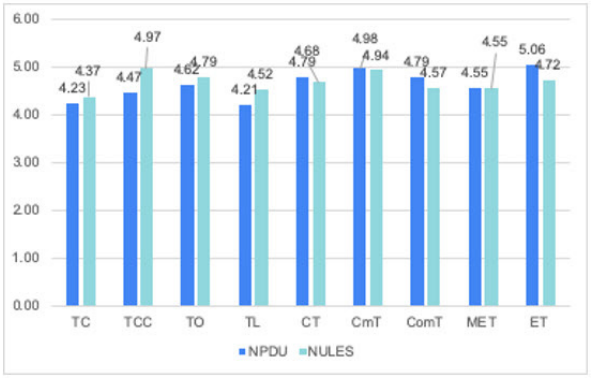

Figure 6. Comparison of the various trust domains between students of the NPDU and the NULES

Students in both universities have almost the same level of trust. In one case the result of NULES is higher ("TCC", the average score of 4,97 for NULES against the average score of 4,47 for NPDU). For other domains conversely, ("ET", the average score of 5,06 for NPDU against 4,72 of NULES).

Thus, according to the quantitative analyze we have concluded that there was no big discrepancy in values. The mean and standard deviation indicate the reliability of the results.

4. DISCUSSIONS

This research contains the features of both quantitative and qualitative analysis. The methods, tools and types of collected data fulfil criteria of quantitative research. But one of the purposes of research suits the criteria of qualitative analysis - to understand and interpret social interactions. The obtained results also fulfil the criteria of qualitative research. They are aimed to make conclusions from the collected data but not to test some previous theory (Apuke, 2017).

The obtained results allow to suggest that the level of trust among students and teachers of the National Pedagogical Dragomanov University (NPDU) and the National University of Life and Environmental Sciences of Ukraine (NULES) is at a stable average level, with slight fluctuations. Higher indicators of trust are present in relation to a close circle of colleagues at the functional level among all respondents, and at a meaningful level, consistently high indicators of environmental trust. This indicates that the universal foundation of trust as a necessary element of the social system is familiar and accepted by respondents as an unconditional value. According to the previous research based on the Social Cohesion Model, trust is one of the key factors of social cohesion, in particular, in the educational community. Obtained results show the appropriate correlation between the level of trust and level of social cohesion at least at the National Pedagogical Dragomanov University (Nesterova, Dielini and Zamozhskyi, 2019).

The indicators of "Trust to the organization" and "Trust to the leaders" are quite different for the NPDU and NULES. Perhaps, it's the result of the specific features of the NPDU's management. In general, the levels of "Trust to the organization" and "Trust to the leaders" are higher among employees than among students. Probably, it could be explained by the stronger work communications.

At the same time, the stable averages in various spheres of the questionnaire regarding the understanding of trust indicate the absence of an active life position, inertia and low initiative. In this case, a vicious circle is obtained: a low level of trust defines a low cohesion of the community. It could be caused by various reasons which demand more deep and detailed investigations. We can presume that specifics of the university's management and organizational climate are quite important for the level of expectations, self-realization and cohesion of the university community members. It will be a matter of further researches.

Application of the research results can be useful for the development of social and emotional intelligence among teachers and students, who, in turn, are able to transmit new and productive interaction practices that are based on trust and cohesion. One of the main results is the practical strengthening of the trust in the university communities because of people's awareness of what the trust means. Free discussions about various aspects of trust, "a common language of trust" will increase the understanding of cohesion processes and will increase the real level of trust in organization (Reina D.S. and Reina M. L., 2007). So, this research will sufficiently impact to the social cohesion development in the university communities of NULES and NPDU. Also, it will launch the effective communication processes because of internal discussions about the questionnaire and obtained results.

5. CONCLUSIONS

Trust could be considered as central element and cognitive base of social cohesion. Without the ability to trust other people and institutions, as well as without understanding the need to justify the reasonable expectations of partners, effective social interaction is problematic.

The study of trust in its functional and meaning keys is important and perspective for the implementation of methods of increasing social cohesion both in the educational space and in society as a whole. The questionnaire showed that the level of trust as a psychological tendency, trust to the organization and leaders is much lower, than trust to the close circle of

colleagues. This indicates that the basis of trust is most often the experience of interpersonal interaction, and not the values and goals of joint activities. At the same time, the study of trust at a substantive level demonstrates that the respondents have a fairly clear understanding of the significance and role of this phenomenon for the existence of society. Trust as a form of social contract, as a basis of communication, as recognition of authorities and moral ideals, as a kind of balance of the contradiction of different interests - all these values are familiar and approved by both employees and students of both universities.

The cognitive aspects of trust are necessary for monitoring, analytics and related corrective actions. The level of trust is directly correlated with the level of social cohesion in the university communities. The indicators of cohesion are based on the ability and willingness to trust and to realize the expectations of others. This problem is especially significant in the educational environment, since the process of obtaining new knowledge, its understanding and application requires trust in the era of the annihilation of traditional values and the aggressive nature of the information environment. The long-term study of social cohesion and the above research as one part of it will improve the level of trust (and social cohesion accordingly) because of the awareness of the structure of trust and wide and open discussions in this matter in the university communities.

ACKNOWLEDGEMENTS

The authors are grateful to all participants of the research. The above research is the part of the project's implementation in the National Pedagogical Dragomanov University of Jean Monnet Module "Social Cohesion in Education and Governance: European Studies" (Erasmus + Program granted by European Commission).

Conflict of interests

The authors declare no conflict of interests.

REFERENCES

Apuke O.D. (2017). Quantitative research methods: a synopsis approach. *Kuwait Chapter of Arabian Journal of Business and Management Review, 6(10),* 40–47. https://doi.org/10.12816/0040336

Bachtler, J. & Mendez, C. (2016). *EU Cohesion Policy and European Integration: The Dynamics of EU Budget and Regional Policy Reform*, London, Routledge, p. 336 https://doi.org/10.4324/9781315580630

Blum, L. (2014). Three educational values for a multicultural society: Difference recognition, national cohesion and equality. *Journal of moral education, 43(3)*, 332-344. https://doi.org./10.1080/03057240.2014.9227

Budnik, C. (2018). Trust, Reliance, and Democracy. *International Journal of Philosophical Studies, 26(2)*, 221-239, https://doi.org/10.1080/09672559.2018.1450082

Dragolov, G., Ignácz, Z., Lorenz, J., Delhey, J., & Boehnke, K. (2013). *Social cohesion radar measuring common ground:* An international comparison of social cohesion methods report. Retrieved from http://aei.pitt.edu/74134/1/Social_cohesion_radar.pdf

Grierson, E. M. (2018). Trust and fiduciary relationships in education: What happens when trust is breached?. *Educational Philosophy and Theory, 50(2),* 203-211. https://doi.org/10.1080/00131857.2016.1231052

Healy, M. (2019). Belonging, social cohesion and fundamental British values. *British Journal of Educational Studies, 67(4),* 423-438, https://doi.org/10.1080/00071005.2018.1506091

Holden, A. (2013). Community cohesion in post-16 education: principles and practice. *Educational Research, 55(3)*, 249-262, http://dx.doi.org/10.1080/00131881.2013.825162

Nesterova, M., Dielini, M., & Zamozhskyi, A. (2019). Social cohesion in education: cognitive research in the university community. *International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE), 7(2)*, 19-27. https://doi.org/10.5937/IJCRSEE1902019N

Reina, D. S., & Reina, M. L. (2007). Building sustainable trust. *Od Practitioner, 39(1)*, 36–41. Retrieved from https://reinatrustbuilding.com/wp-content/uploads/2016/02/ODN-Building-Sustainable-Trust-wout-quiz.pdf

Roberts-Schweitzer, E., Greaney, V., & Duer, K. (Eds.). (2006). *Promoting Social Cohesion Through Education: Case Studies and Tools for Using Textbook*s. The World Bank. https://openknowledge.worldbank.org/handle/10986/6985

Sasson, I. (2019). Building a sustainable university–community partnership: case study in science education. *Studies in Higher Education, 44(12),* 2318-2332. https://doi.org/10.1080/03075079.2018.1496410

Social Cohesion and Education. Retrieved from https://education.stateuniversity.com/pages/2428/Social-Cohesion-Education.html

Value-based Education. Retrieved from https://www.ledbury.hereford.sch.uk/values-based-education/

Нестерова, М. О. (2015). *Когнитивистика: истоки, вызовы, перспективы.* [Cognitive science: sources, challenges, prospects]. Суми, Університетська книга. http://www.enpuir.npu.edu.ua/bitstream/123456789/19818/2/Nesterova_2015.pdf

COGNITIVE MODELS IN PLANIMETRIC TASK TEXT PROCESSING

Dr. Xenia Naidenova, Military Medical Academy, Saint Petersburg, Russian Federation
E-mail: ksennaidd@gmail.com
Dr. Sergey Kurbatov, Research Center of Electronic Computer Engineering, Moscow, Russian Federation
E-mail: curbatow.serg@yandex.ru
Dr. Vyacheslav Ganapolsky, Military Medical Academy, Saint Petersburg, Russian Federation
E-mail: Ganvp@mail.ru

ARTICLE INFO

Original Research
Received: February, 18.2020.
Revised: April, 01.2020.
Accepted: April, 08.2020.
doi: 10.5937/IJCRSEE2001025N

UDK
159.955.3/.4

Keywords:
planimetric tasks,
natural language analysis,
cognitive approach,
dynamic visualization,
intelligent system.

ABSTRACT

A new cognitive approach is proposed for understanding the texts of planimetric tasks and for visualizing the task conditions to complement the syntactic-semantical sentence parsing. Two main difficulties in understanding texts of plane geometry tasks are observed: the ellipticity and vagueness of texts. To overcome the difficulties in understanding the task conditions it is proposed constructing cognitive models of objects and relations between them. The proposed cognitive approach is incorporated in an integrated system for automatic solving planimetric tasks with the natural language interface. The interactive visualization has been developed in the system. It depicts the syntactic and semantic structures as a result of natural language text analysis and searching for task solution. This visualization allows the users to obtain explanations associated with any elements of the images and to correct the tasks' texts in dialog with the system. The destiny of the system is to serve for training schoolchildren in the domain of Euclidean geometry. The cognitive approach proposed can be a first step to automated analyzing plane geometry texts, in perspective, as a cognitively controlled parsing.

1. INTRODUCTION

An integrated intelligent system to solve natural language planimetric tasks is considered. The system embodies some intellectual characters: it contains and uses the problem domain knowledge (plane geometry), it has a natural language interface and understands texts of geometric tasks. The solver of the system works based on heuristic search for solution. Visualization in this system is aimed at showing as much as possible all the stages of the system's functioning and giving in the "point and click" manner explanations about the content and genesis of any element of the drawing.

Corresponding Author
Dr. Xenia Naidenova, Military Medical Academy,
Saint Petersburg, Russian Federation
E-mail: ksennaidd@gmail.com

Drawing the conditions of geometrical tasks is a key problem in the system (for students too). The difficulty in analyzing and understanding the text is induced by various reasons. One reason is the ellipticity of the text. The resolution of ellipses in the texts of planimetric tasks is considered by us in (Kurbatov, Naidenova and Ganapol'skii, 2019).

However, there are difficulties in understanding texts without ellipses too. These difficulties are caused, first, a vague text language that is not logically and linguistically clear. Secondly, these difficulties are induced by the necessity to attract general geometric knowledge related to objects and relationships in the texts of tasks. Thirdly, some difficulties are explained by the need to choose from several building options, or to formulate additional considerations (conditions) for drawing. The latter circumstance requires the involvement, in the process of drawing, various assumptions and logical conclusions.

An example of a lack of text clarity might be the task: "two circles of radii r and

R (r < R) are located such that one of their internal tangents is perpendicular to one of their external tangents. Find the area of the triangle formed by these tangents and one of the internal tangents".

Some examples of involving the common geometric knowledge are:

1. "Three circles, the radii of which are 1, 2, and 3, touch in pairs externally. Calculate the radii of two circles, each of which touches to three given circles". (Here it is required understanding how to build two additional circles).

2. "Through point R, lying on the continuation of diagonal AC of quadrangle ABCD and the middle of sides BC and CD, are drawn two straight lines crossing sides of AB and AD, respectively, in points E and F. Prove that the straight lines EF and BD are parallel". (In this task, it is necessary to take into account that through two points you can draw only one straight line, and two straight lines should intersect at point R).

3. "Find the corners of an equilateral triangle if its altitude is half the bisector of angle at the base". (Here you have to decide what altitude is meant).

4. "A square is inscribed in the other square. Calculate a smaller angle between the sides of the squares if their areas are related as 2:3". (It is important to consider the position of the vertices of the inscribed square).

There are the tasks for which drawing their conditions is possible only after their solution. For example: "Is there a rectilinear polygon in which the length of one of its diagonals equals the sum of two other diagonals?"

Call these difficulties cognitive expectations. Cognitive expectations are apparently quite common when generating natural language texts. That is why we come to the idea of involving in the analysis of texts cognitive graphics and relations pre-formed in the system of solving planimetric problems. We can use them during the visualization of a task condition in dialogue with a user. The user can be a high school student, a teacher, and a schoolboy.

Despite the fact that the problems of resolving ellipses are widely discussed theoretically, most of works address only to a special type of ellipses, namely the verb ellipses (VE) and exclusively for English (Kenyen-Dean, Cheung, and Precup, 2016), (Liu, Gonzalez and Gillick, 2016), (McShane and Babkin, 2015; 2016). These ellipses refer to the omission of a verb phrase whose meaning can be reconstructed from the context. The structure of this ellipsis consists of two parts standing in a sentence on the right and left of the "dash". An example: "one had the power of the Sun, the other – the Moon".

To resolve multiple ellipses, a new method is advanced in (Shuster, Nivre and Manning, 2018). An example of multiple ellipsis is: "the prices growth amounted to 11.9% in 2003, in 2009 – 4.4 %, in 2014 – 7.5%.

It should be noted that the question of how to restore the full structure of elliptical part of a sentence has not been fully solved in the conventional approach based on syntactical-semantic parsing sentences. Linguists have already realized the restriction of the syntactical-semantic approach to resolving ellipses in which syntax is separated from semantics (Jurafsky, 1993, p. 3). In (Zhao, 2016), the following answers are compared to the basic questions in the framework of generative linguistics and cognitive approach:

- Is ellipsis a syntax unit?
- Is the meaning of ellipsis determined only by its antecedent?
- Is reconstructing the missed part in a sentence equivalent to understanding the ellipse in it?

Generative linguists answer these questions in the affirmative. Adepts of cognitive linguistics tend to answer in the negative. Thus, P. W. Culicover and R. Jackendoff, (2006, p. 414) state that there is no additional syntax structure corresponding to the missing words in the sentence and, therefore, the study of ellipses based on grammatical rules does not make sense.

The cognitive approach states that the meaning of the missed part of a sentence depends greatly on the meaning of the whole sentence. Understanding ellipsis does not mean that we first have to restore it, and then to turn to understanding the whole sentence. In fact, understanding the sentence also entails understanding the ellipsis in it. The meaning of the ellipsis is defined both by the explicit part of a sentence and by the knowledge of the subject area, including linguistics, pragmatics, encyclopedic knowledge, context etc.

Generative linguistics is not interested in the real human mental processes taking place in ellipsis resolutions. Cognitive linguists suggest that the design of meaning is a conceptual process (Langacker, 2009) and language itself does not encode meanings, but only gives a hint at their design (Evans and Green, 2006, p. 162).

2. MATERIALS AND METHODS

2.1. Description of the system for automated solving planimetric tasks

The main concept of the system for solving planimetric problems has been developed in (Khakhalin et all., 2012), (Kurbatov, Fominykh and Vorobyev, 2019) and its general scheme is given in Figure 1. The concept of "integrated system" covering natural language interface, heuristically oriented solver and conceptual visualization is described in (Lobzin et all., 2015).

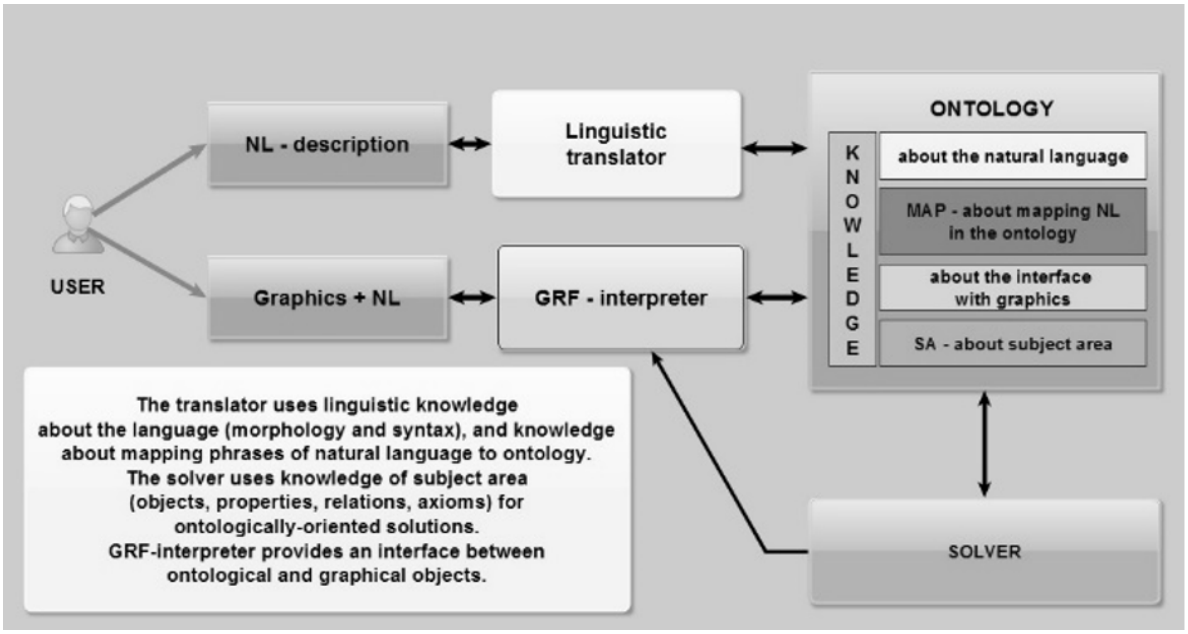

Figure 1. General scheme of the system

The system consists of the following blocks: "Ontology", "Solver", "Linguistic translator", "Graphics+NL", and "GRF interpreter" modules for drawing and explaining the results accompanied by the NL-explanation of the solution process.

The ontology serves for representing knowledge necessary for functioning all the subsystems of the system.

The task of the linguistic translator is to construct the conceptual description of a given geometrical situation in terms of concepts and relations of the ontology.

The solver takes the ontological description of task and searches for solution modifying the solution's intermediate semantic representation.

We use the semantic hypergraphs' language for the ontology representation. This language is an extension of semantic networks and it provides a suitable basis for naturally representing n-dimensional relations. For the Ontology's implementation, DBMS Progress has been used. In more details, the system ontology is described in (Kurbatov and Vorobyev, 2016).

The linguistic translator performs several processes: traditional grammar and semantic analyses, and semantic interpretation of planimetric task texts. The grammar analysis covers morphological and syntactic analyses. The semantic interpretation consists in "translating" text's fragments into corresponding ontological structures.

Processing NL-texts of planimetric tasks is based on the linguistic concept of paraphrasing (Apresian et all., 2010). With the help of the paraphrasing, subject-oriented text is translated into canonical structures directly displayed in the ontology. In the aspect of our fixed subject area, it is assumed that there are some standard (canonical) NL-descriptions of objects and relations.

The solver uses two components: heuristic and logical ones. The examples of heuristic rules are: reducing a task to its algebraic formulation; using the geometric concept of "locus of points"; searching for some cognate task; focusing on objects having maximal number of known and derived constituents; using empirical guesses; using statistical data; limiting the depth of search; beginning with the simple actions; using the symmetry; the trial and error method; using inductive reasoning, and some others.

The operations are performed on

semantic structures (SemS) (Mel'čuk, 2018). There are two kinds of operations: basic operations or construction axioms and general operations. Examples of basic operations: construction of straight line passing through two already constructed (given) points; construction of circle having the center in an already constructed point and radius equal to the segment connecting some already constructed points; construction of the intersection of two already constructed figures; selection of an arbitrary set of points belonging to one of already constructed figures. General operations realize the construction implemented with the use of basic operations and, possible, other general ones.

The interactive visualization provides the incremental control of syntactic and semantic structure formation and displaying the process of searching for task's solution. It is always accompanied by the explanation of elements of drawings and system solutions. The system allows to modify all the graphical images with keeping tasks' conditions. Figures 2 and 3 show the syntactic and semantic structures for the following task:

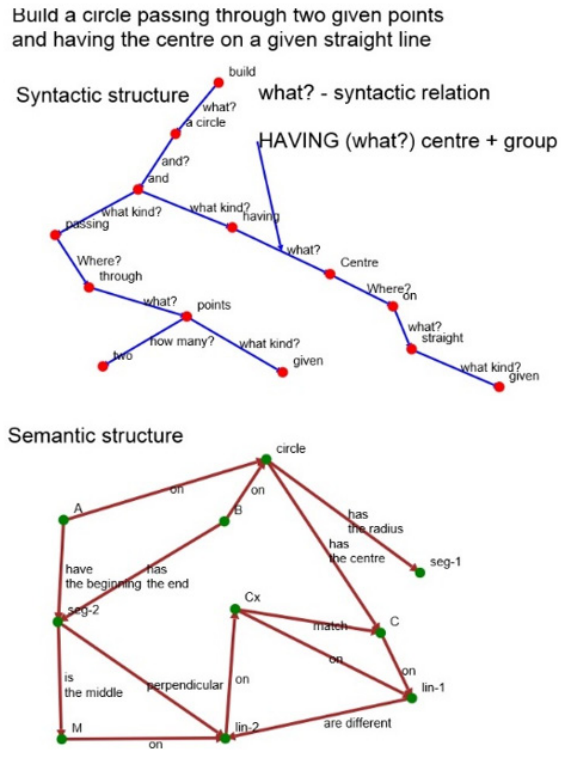

Figure 2. Syntax and semantic structures

"Build a circle passing through two given point and having the center on a given straight line".

It is possible by clicking on an object, for example, on word "*build*" or link "*what?*", to obtain the information about the characteristics of selected issue and the grounds for its creation (appearance).

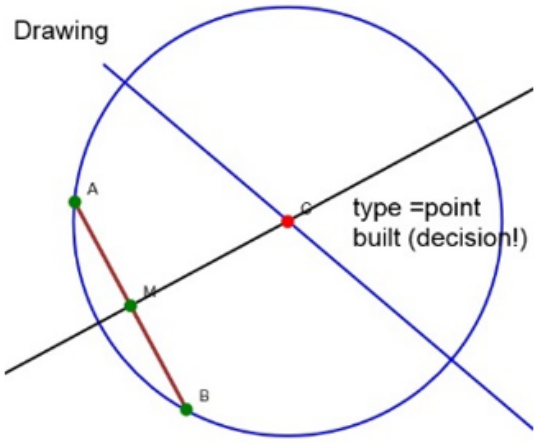

Figure 3. Drawing dynamically formed by the system as the solution protocol

The system visualization simplifies greatly debugging the ontology.

Each semantic and syntactic structure has its presentation in the ontology. This presentation is transformed into the natural language text taken by the program of visualization. Based on linguistic processing and solution search, a protocol is extracted from the ontology that forms a text file with a visualization program.

The interactive visualization is implemented based on javascript. Libraries JSXGraph (JSX Graph Reference) and MathJax (MathJax Documentation) were used to support graphics and mathematical formulas.

2.2. Cognitive models of objects and relations

The process of binding objects extracted from texts can be supported by cognitive models of objects and relationships between them. Cognitive scheme is designed to make syntax analysis of texts more effective, especially in cases of ambiguity and ellipses. Therefore, the cognitive scheme will combine three components:

• Semantic component in the form of a specific relationship between objects (typical geometric situation);

• Syntactical component associated with the semantic component, on the one hand, and with the corresponding fragments of text, on the other hand;

• Visual component in the form of a drawing of the corresponding geometric

situation.

Semantic component can be expressed by using the system ontology.

We also assume that cognitive structures correspond to profound structures of geometrical situations outlined in the texts and define the structures of noun phrases (NPs), prepositional phrases (PPs), and verb phrases (VPs). Cognitive approach deals with modeling processes occurring in the human brain during solving the complex thought problems. In the case of geometric constructs, the cognitive process is associated with thinking about concrete objects (Sechenov, 2008). Cognitive models reflect the following relationships:

- object carries out some actions;
- object is subjected to actions of other objects;
- object has different relationships (spatial, temporal) with other objects;
- object can be compound;
- object can be a part of another object;
- object has properties (call them actant ones) related to the actions that object carries out (intersects – intersecting, touches – touching) or the actions performed on it (has been constructed – constructed, has been inscribed – inscribed). Thus, the actant properties are directly reflected in the morphological forms of words describing them;
- the relationships between the properties of one object or between the properties of different objects.

The cognitive models of objects and actions are created, in our approach, in an incremental mode using geometry school textbooks. Tables 1 and 2 depict some fragments of cognitive model "Bisector". An example of interacting NP and VP with cognitive scheme is given in Figure 4.

3. RESULTS

3.1. Dynamic visualization of cognitive models

Within the proposed approach, it is possible to use the tool of interactive dynamic visualization to create the initial drawing representing the task conditions and implicit relationships hidden in them. Now the ontology will be involved in constructing the draft of task condition.

Consider the cognitive scheme and its visualization for the following task: *Two circles are internally touch each other in a point A. From the center of greater circle, it is drawn radius OB touching the smaller in point C.*

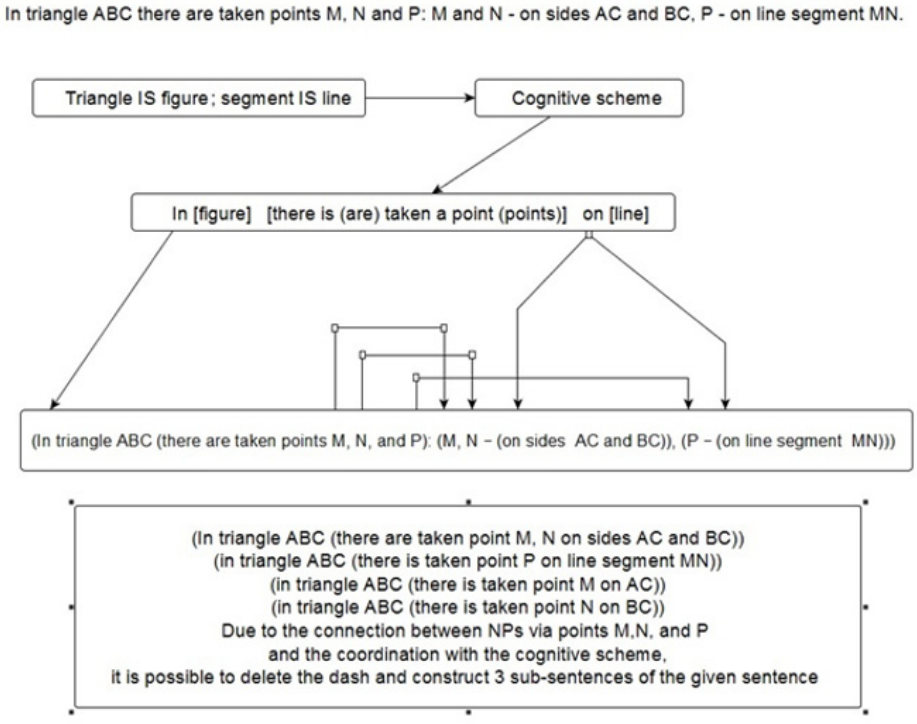

Figure 4. An example of interacting VP and NPs with a cognitive scheme

Table 1. Noun Phrases including "Bisector"

Bisector	Hyperlink to object (to NP)	Hyperlink to object (to PP)
Bisector of	angle	
Bisector of	angle	in (of) triangle
Bisector of	acute angle	in (of) rectangular triangle
Bisector of	inner angle	in (of) triangle
Bisector of	angle	at base of isosceles triangle
Bisector coming from	vertex	of inscribed triangle
Bisector of	angles adjacent to one side	in (of) parallelogram
Bisector of		in (of) triangle
Bisector of	inner angle	in (of) parallelogram
Bisector of	angle	in (of) convex quadrilateral
Bisector of	angle	in (of) rectangle

Table 2. Verb Phrases including "Bisector"

Bisector	Hyperlink to action	Hyperlink to object (to PP)
Dividing	To divide	Side of triangle
Perpendicular	To be perpendicular	Median of triangle
Splitting, cutting in	To split, to cut in	Side of parallelogram in segments
Intersecting	To intersect	Bisector of triangle
Intersecting	To intersect	Circle
Restricting	To restrict	Area of quadrangle
Coming across	To come across	Circle in points
Containing	To contain	Points of intersection
Lying on	To lie	Straight line

We need the cognitive scheme "internally touching two circles" (Figure 5). The dynamic visualization program generates all possible variants of this situation, but it keeps the condition of "internally touching" (as an invariant one). The ratio between the lengths of the circles' radii and the reciprocal positions of their centers will be changeable. The center of the larger circle may be outside or within the smaller circle. So, we have two possible drawing of the current situation.

Now we take into account the other condition of the task: from the center of greater circle, it is drawn radius OB touching the smaller in point C. We turn to the cognitive scheme "to draw a tangent to a circle" (Figure 6). From this scheme, it will be known that the tangent is located outside the circle and has only one common point with it. Since the tangent line is simultaneously the radius of the larger circle, this radius should lie outside the smaller circle. Therefore, the center of the larger circle should lie outside the smaller circle. We have two variants of drawing consistent with the previous conclusion. Since there are no more conditions limiting the choice, we can take any option. Then the angle is selected the magnitude of which is unknown (Figure 7).

In the process of text analysis, the drawing satisfying a task conditions is created incrementally. This means that the solution of tasks begins together with this process.

The use of an interactive cognitive-oriented visualization is reflected in Figures 5, 6, and 7. After the "Start building" step, the user can modify the drawing (moving elements by mouse or requesting a system modification of the drawing). However, this action requires the organization of a dialogue with the system in the process of work.

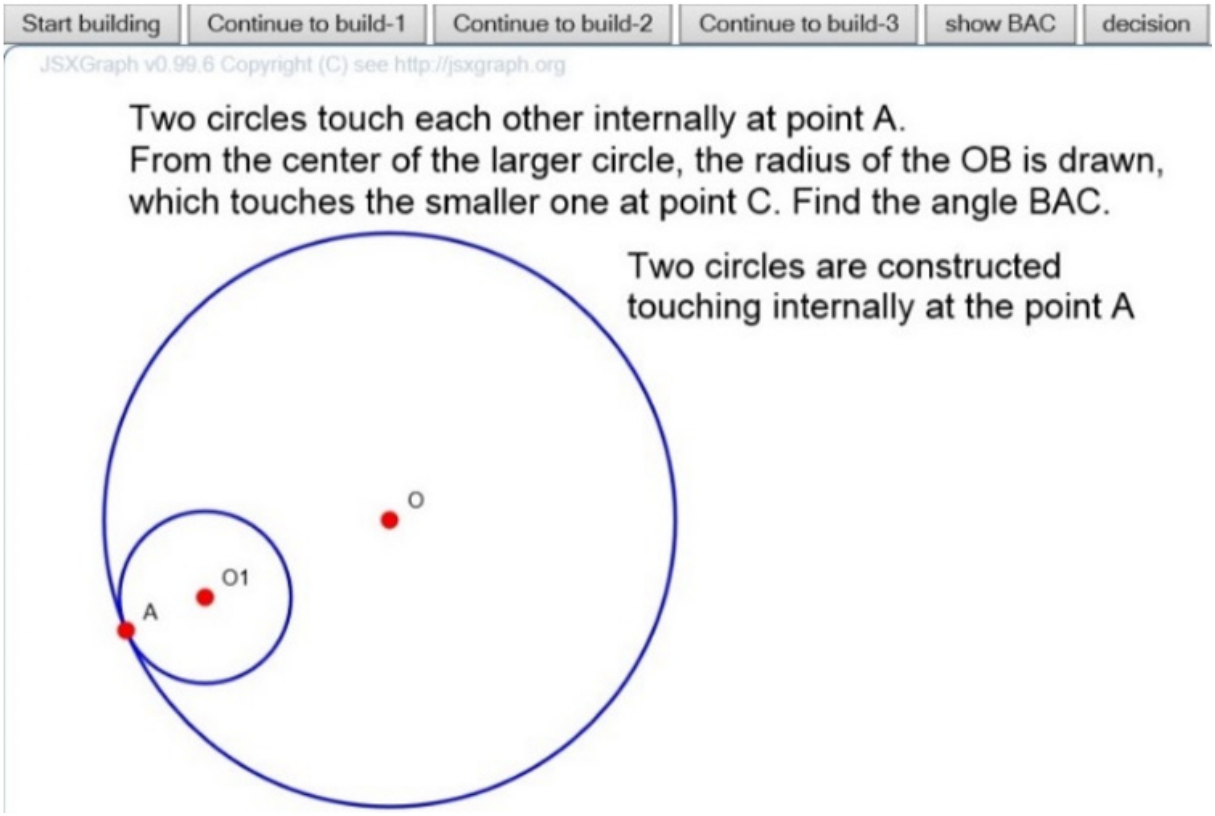

Figure 5. The draw of task after "Start building" (screen shot step)

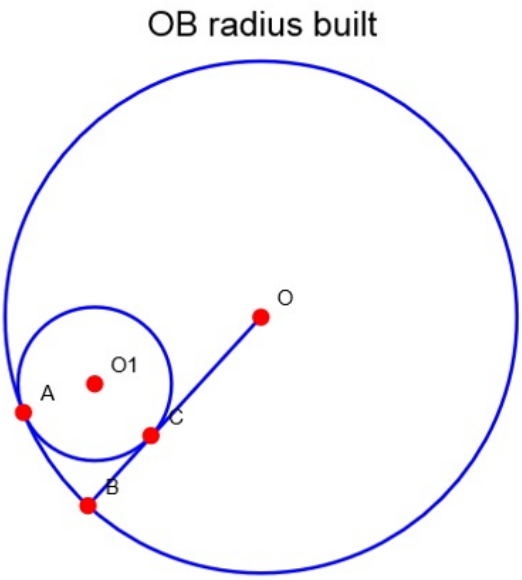

Figure 6. The draw of task after the step "Continue build-2"

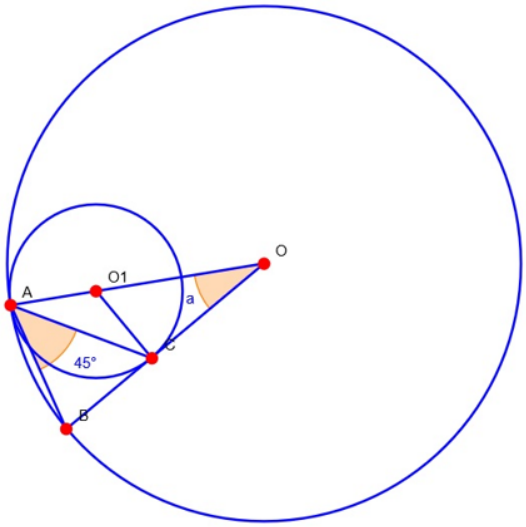

Figure 7. The draw of task after the step "Decision"

3.2. Using cognitive schemes in dialog with the users

Let a task be given: "two circles of radii r and R (r < R) are located such that one of their internal tangents is perpendicular to one of their external tangents. Find the area of the triangle formed by these tangents and one of the internal tangents". Figure 8 is the drawing

corresponding with this task.

Suppose that the system fails to understand completely the text of this task and cannot construct the correct drawing of the task condition.

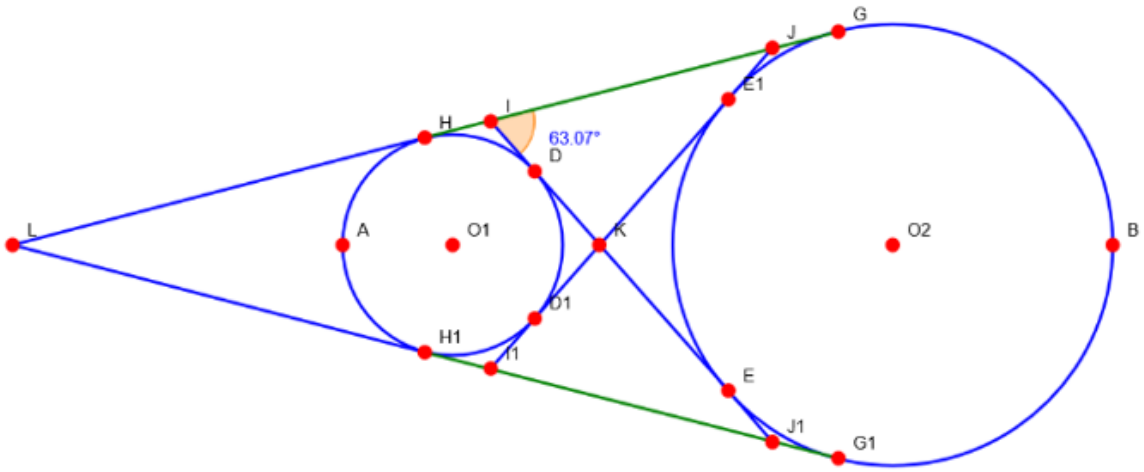

Figure 8. Drawing the initial cognitive structure

The proposed solution is advanced as follow:

1. The task text is used for extracting available cognitive model (for example, via the key words);

2. This model includes:

• semantic cognitive structure;

• the drawing of cognitive semantic structure;

• the natural language description of this drawing.

The drawing of cognitive structure (scheme) is showed to the user via a dialog (by means of simple commands (operations)). The user changes the drawing. The cognitive semantic structure and the task text are changes, in parallel, automatically.

After entering the changes, the system shows the new formed task text to the user.

If the user supports the text, then the new cognitive semantic structure is transmitted to the system solver.

The initial cognitive semantic structure is described as follows:

circle crcl -1 has radius variable r
circle crcl -2 has radius variable R
variable r smaller than variable R

circle crcl-1 has external_tangent line pr-1
circle crcl--1 has_external_tangent line pr-2
circle crcl--2 has_external_tangent line pr-1
circle crcl--2 has_external_tangent line pr-2

circle crcl--1 has intenal_tangent line pr-3
circle crcl--2 has_internal_tangent line pr 4

poin L on line pr-1
point L на line pr-2

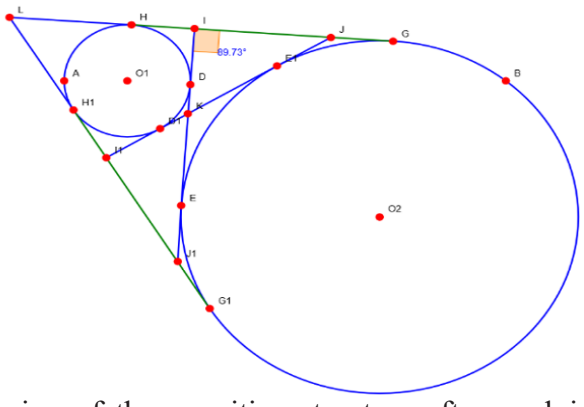

Figure 9. The drawing of the cognitive structure after applying the command about perpendicular lines

Natural language description of the drawing: “two circles of radii r and R (r < R) have internal and external tangents”.

With the use of the command “selected straight lines are perpendicular” the drawing is changed (it is really working example). The result is in Figure 9.

With the use of the command (operation) «Find the area of triangle IJK” the task condition is made more exact.

Selecting objects can be done by a click of the mouse.

For example, the click on segment D1E1 gives some message and the segment is included in the list of selected objects (Figure 10).

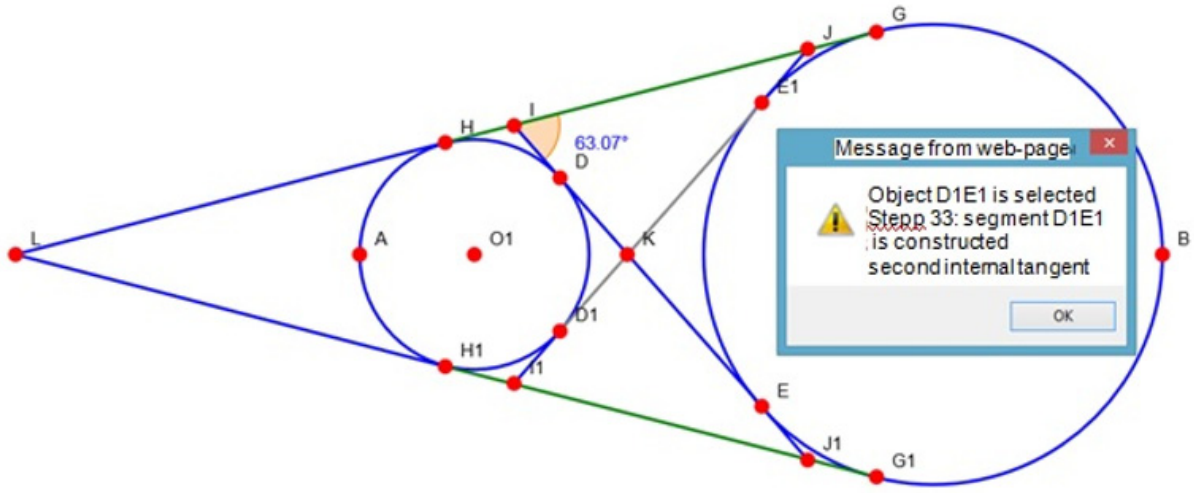

Figure 10. The message appears after selecting segment D1E1

Obtaining messages via the click is only particular case of the click-calling functions. These functions can provide a lot of possibilities: dialog, appeal to the ontology, editing the knowledge.

After supporting the cognitive scheme by the user, the initial text of cognitive scheme "two circle of radii r and R (r < R) have internal and external tangents” is completed by the following text:

“one of the internal tangents is perpendicular to the external one. Find the area of triangle formed by the internal tangents and this external tangent”.

And after supporting the changed text of cognitive scheme by the user, the semantic structure is completed by the following fragment:

line pr-1 perpendicular line pr-3
triangle IJK has the area ?

And finally, the changed semantic structure is passed to the solver.

The commands form the main objects (points, straight lines, circles...) and the relationships between them (to belong, to be perpendicular, to be parallel, to intersect, ...). These operations call directly the library functions jsxgraph as well as create the commenting arrays (step descriptions and their explanations).

Of course, a step-by-step view of forming the drawing included in a cognitive structure is also provided, as well as a number of service functions - "freeze" the drawing, viewing auxiliary constructions (invisible on the drawing to avoid bulkiness), etc.

For example, you can make visible all auxiliary builds, here's an example (Figure 11): In the process of text analysis, the drawing satisfying a task condition is created incrementally.

The use of an interactive cognitive-oriented visualization is reflected in Figures 8-10. The user can modify the drawing (moving elements by mouse or requesting a system modification of the drawing). This action means the organization of a dialogue with the system in the process of work.

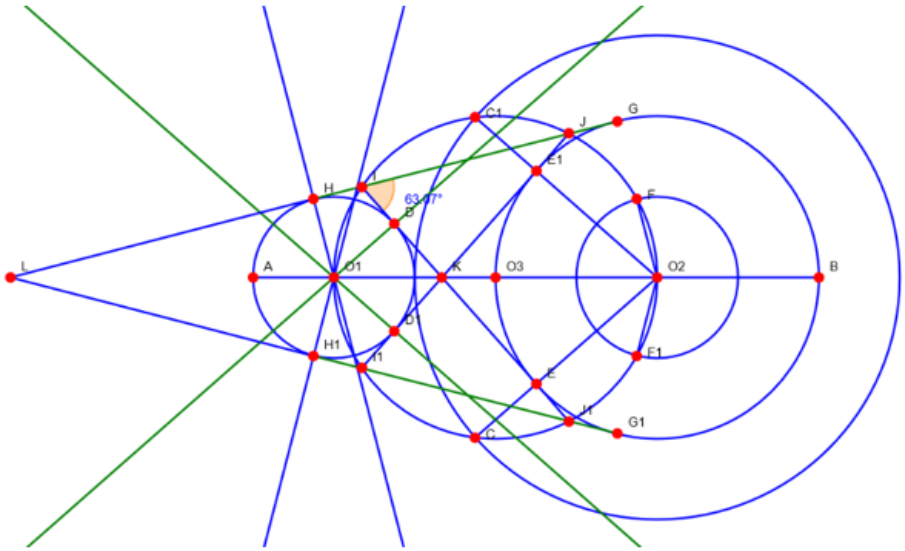

Figure 11. Auxiliary straights and circles needed to build tangents using known algorithms

4. DISCUSSIONS

We resume the features of cognitive models as follows:

• Each cognitive model (scheme) can be displayed as a drawing;

• Visualized dynamic cognitive model determines invariant relationships between its objects as like as all their possible configurations;

• Visualized cognitive models allow to list all the implied objects and relationships between them and to restore elided or hidden elements in the task text;

• The interaction of cognitive schemes implies narrowing the search for task solution.

Tuning system parameters, modifying heuristics and eliminating explicit defects are carried constantly.

Introducing the concept of cognitive model of geometry objects and actions implies that the structure of automated analysis of geometric texts can be considered, in perspective, as a cognitively controlled parsing.

The cognitive models imply also the possibility to synthesize a text describing a geometric situation and compare this text with the text to be analyzed.

5. CONCLUSIONS

The essential role of cognitive approach for understanding natural language texts of planimetric tasks and displaying task conditions in the form of a drawing is shown. A structure of cognitive schemes to represent planimetric objects, relations between them and planimetric constructions is proposed. Two kinds of difficulties in understanding the task texts are described: the ellipticity of texts and their vagueness. It is proposed the dynamic visualization of cognitive schemes and using them in dialog with the user to create the draft of task condition and to restore the task text.

The organization of natural language dialog between the system and the users at all the steps of the system's functioning is the aim of our future investigations.

ACKNOWLEDGEMENTS

The author is very grateful to Professor Svetlana Masalova (Institute of Improvement of Teacher Qualification, Rostov-on-Don, Russia) for supporting this article and expressing the interest in the discussed problems.

The research was carried out with the financial support of the Russian Foundation for Basic Research (RFBR), project no. 18-07-00098a.

Conflict of interests

The authors have not a conflict of interest.

REFERENCES

Apresyan, J. D., Boguslavsky, I., Iomdin, L., & Sannikov, V. (2010). *Theoretical problem of Russian syntax; interaction of grammar and*

vocabulary. Moscow, Russia: Languages of Slavonic Cultures.

Culicover, P. W., & Jackendoff, R. (2006). The simpler syntax hypothesis. *Trends in cognitive sciences, 10(9),* 413-418. https://doi.org/10.1016/j.tics.2006.07.007

Evans, V., & Green, M. (2006). *Cognitive linguistics: An introduction.* Edinburgh, Scotland: Edinburgh University Press.

Jurafsky, D. (1993). *A cognitive model of sentence interpretation: The construction grammar approach.* International Computer Science Institute. Retrieved from http://http.icsi.berkeley.edu/ftp/pub/techreports/1993/tr-93-077.pdf

JSXGraph Reference. Retrieved from https://jsxgraph.uni-bayreuth.de/docs/index.html

Kenyon-Dean, K., Cheung, J. C. K., & Precup, D. (2016). Verb phrase ellipsis resolution using discriminative and margin-infused algorithms. In *Proceedings of the 2016 Conference on Empirical Methods in Natural Language Processing* (pp. 1734-1743). Retrieved from *https://www.aclweb.org/anthology/D16-1179.pdf*

Khakhalin, G. K., Kurbatov, S. S., Naidenova, X., & Lobzin, A. P. (2012). Integration of the Image and NL-text Analysis/Synthesis Systems. In *Intelligent Data Analysis for Real-Life Applications: Theory and Practice* (pp. 160-185). IGI Global. https://doi.org/10.4018/978-1-4666-1806-0.ch009

Kurbatov, S., Naidenova, X., & Ganapol'skii, V. (2019). Resolving ellipses in planimetric tasks as cognitive process. In Masalova, S. I., & Solovyev, V. D. (Eds.). *Proceedings of the VIIth International Scientific Conference on Cognitive Modeling in Science, Culture, Education (CMSCE-2019). Part 2. Cognitive Modeling in Linguistics (CML-2019)* (pp. 114-121). Rostov-on-Don, Russia: Science and Studies Foundation.

Kurbatov, S., Fominykh, & Vorobyev, A. (2019). Interactive visualization of cognitive structure in an integral system. In Proceedings of the 17th National Conference on Artificial Intelligence with International Participation (CAI-2019). Vol. 2 (pp. 222-230). Ulyanovsk: USTU.

Kurbatov, S., & Vorobyev, A. (2016). Ontological solver of geometry problems in natural language description. In *Proceedings of the 15th National Conference on Artificial Intelligence with International Participation (CAI-2016).* Vol. 1 (pp. 56-63). Smolensk, Russia: Universum.

Langacker, R. W. (1990). Subjectification. *Cognitive Linguistics (includes Cognitive Linguistic Bibliography), 1(1),* 5-38. http://dx.doi.org/10.1515/cogl.1990.1.1.5

Liu, Z., Gonzalez, E., & Gillick., D. (2016). Exploring the steps of VPE. In *Proceedings of the Workshop on Conference Resolution Beyond OntoNotes (CORBON 2016)*, co-located with NAACL (pp. 32-40). San Diego, California: Association for Computational Linguistics.

Lobzin, A., Khakhalin, G., Kurbatov, S., & Litvinovich, A. (2016). Integration based on natural language and image ontology in the system Text-To-Picture. In *Proceedings of the 8th Scientific-Practical Conference Integrated Models and Soft Computing in Artificial Intelligence. Vol. 1* (pp. 296-305). Moscow, Russia: Physical-Mathematical Literature.

MathJax Documentation, Release 3.0. (2020). Retrieved from https://readthedocs.org/projects/mathjax/downloads/pdf/latest/

McShane, M., & Babkin, P. (2015). Automatic Ellipsis Resolution: Recovering Covert Information from Text. In *Proceedings of the Twenty Ninth AAAI Conference on Artificial Intelligence.* pp. 572- 578. Palo Alto, California: The AAAI Press. Retrieved from https://www.aaai.org/ocs/index.php/AAAI/AAAI15/paper/view/9441/11326

McShane, M., & Babkin, P. (2016). Detection and resolution of verb phrase ellipsis. LiLT (Linguistic Issues in Language Technology), 13, 1-36. Retrieved from http://www.cogsci.rpi.edu/~mcsham2/MargePapers/McShane_Detection_2016.pdf

Mel'čuk, I. A. (2018). Anna Wierzbicka, Semantic Decomposition, and the Meaning-Text Approach. *Russian Journal of Linguistics, 22(3),* 521-538. http://dx.doi.org/10.22363/2312-9182-2018-22-3-521-538

Naidenova X. A., Kurbatov S. S., & Ganapol'skii, V. P. (2018). An analysis of plane task text ellipticity and the possibility of ellipses reconstructing based on cognitive modelling geometric objects and actions. In A. Elisarov, & N. Loukachevich (Eds.). In *Proceedings of Computational Models in Language and Speech Workshop (CMLS 2018) co-located with the 15th TEL International Conference on Computational and Cognitive Linguistics (TEL-2018).* Vol. 2 (pp. 70-85). Kazan, Russia: Academy of Sciences of RT. Retrieved from http://ceur-ws.org/Vol-2303/

Sechenov, I. M. (2008). *Elements of thoughts.* Saint-Petersburg, Russia: "Piter".

Schuster, S., Nivre, J., & Manning, C. D. (2018). Sentences with gapping: Parsing and reconstructing elided predicates. In *Proceedings of the 2018 Conference on the North America Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL 2018)* (pp. 1156-1168. Retrieved from https://arxiv.org/abs/1804.06922

Zhao, G. (2016). A cognitive approach to ellipsis. *Theory and Practice in Language Studies, 6(2),* 372-377. http://dx.doi.org/10.17507/tpls.0602.20

THE ROLE OF STUDENTS' LIFE COURSE CONCEPTION IN THEIR SELF-DEVELOPMENT

Dr. Natalia Lyz, Southern Federal University, Russian Federation,
E-mail: nlyz@sfedu.ru
Dr. Amina Prima, WIS Software, Rostov-on-Don, Russian Federation,
E-mail: amina.prima@gmail.com
Dr. Anna Opryshko, Southern Federal University, Russian Federation,
E-mail: opranna@yandex.ru

ARTICLE INFO

Original Research
Received: January, 15.2020.
Revised: February, 17.2020.
Accepted: February, 29.2020.
doi: 10.5937/IJCRSEE2001037L

UDK
159.947.5.072-057.875

Keywords:
engineering education,
students,
intentional self-development,
life course conception.

ABSTRACT

To facilitate students' self-development it is necessary to understand the inner factors of this process as well as the ways of increasing its productivity. This paper studies whether a person's idea (mental representations) of their own life course influences self-development. To examine this phenomenon 215 engineering students completed the study. The empirical research included two phases. The purpose of the first phase was to examine if there was co-herence of the two analyzed constructs – the life course conception and in-tentional self-development. During the second phase a programme was im-plemented which was dedicated to the improvement of students' life course conception. Also, changes in indicators of self-development and life course conception were studied. The results show that maturation of student's life course conception, awareness of experience and future goals, understanding of one's significant life achievements, attitude toward oneself as a source of life events and achievements, and thoughtful actions in goal pursuit promote intrinsic motivation, and activity in self-development. The improvement of student's life course conception and formation of meaningful ideas about their own lives help to actualize self-development. The results of the study can be implemented in education programmes' development in order to choose appropriate methods for the facilitation of students' self-development.

1. INTRODUCTION

Ability of lifelong learning and self-development plays a major role in acquiring necessary skills of engineering students. Complexity, diversity, variability of modern world and industry, knowledge growth, and continuous technological development require permanent development and practicing of personal and professional skills by engineers. Therefore, one of the key competencies of a skillful engineer is to be able to manage intentional self-development which is understood to be a specific, inner-directed, and goal-oriented activity of a person with workable life goals, and ambitions to widen knowledge, skills, and abilities by means of self-changing and self-improvement. As Pappas and Pappas, 2011 point out that "solving complex global problems and helping students face unprecedented personal challenges and an uncertain future will require additional innovative and experimental approaches to teaching cognition and intentional self-development skills" (ibid, p.370). Along with vocational training self-development in higher education is an urgent aspect of formation of a truly professional (Mirzagitova and Akhmetov, 2015). Students' self-development is possible and is to be facilitated in educational environment (Lyz and Opryshko, 2016; Pappas and Pappas, 2011; Perez, Cromley, and Kaplan, 2014).

Taking into account an important role of personality in the process of professional growth and self-development (Kibal'chenko and Eksakusto, 2019; Lyz, 2012), it is worth noting that personal and social development

Corresponding Author
Dr. Natalia Lyz, Southern Federal University, Russian Federation,
E-mail: nlyz@sfedu.ru

of engineering students is complicated for several reasons: their preference of operating dehumanized models and sign systems, and gaining experience is mediated by technical means in learning. Technically based educational environment is, on the one hand, characterized by actualization of rational abilities and logical thinking of individuals, but, on the other hand, due to decreasing aspects of human perception and interaction it cannot provide a person with enough emotional expression sharing, communication (Lyz and Poznina, 2010). Such environment does not contribute to the process of self-knowledge, self-determination and self-development. In fact, psychologists point out that engineering students have significantly lower empathy than students of other subjects (Rasoal, Danielsson, and Jungert, 2012), lack social competence (Emilsson and Lilje, 2008), and generic skills (Stiwne and Jungert, 2010). In addition, in the process of self-development engineering students face challenges and barriers such as electronic over-stimulation and distraction, dysfunctional relationship with time, difficulty making intentional changes, relationship and communication difficulties, stress and tension (Pappas and Pappas, 2011). In this regard, targeted measures to foster students' self-development are essential.

In general, despite the importance of the topic of student self-development, there is not enough research specifically in enhancing self-development in engineering education. To facilitate students' self-development it is necessary to understand the essence and internal factors of this process as well as the ways of increasing its productivity. This paper intends to study this problem. With reference to existing sources on this topic below we cover the main theories of self-development and an important role of an individual in this process, consider internal factors of self-development; and point out subjective ideas of life course (named in this work as "life course conception"). The methods and results of empirical study demonstrating the role of life course conception in intentional self-development are also presented in this work.

1.1. Intentional Self-Development: Problem Field

It is stated that humans may play the role of agents of their own development: individuals are both the products and producers of their self-development and their motivations guide and shape it (Brandtstädter, 2009). Such phenomenon as self-development, self-cultivation, self-construction and self-improvement are widely studied in social sciences and education. Constructivist self-development theory which blends object relations, self-psychology, and social cognition theories was developed within the scope of psychotherapy and health psychology (Stiwne and Jungert, 2010). Cultural-historical methodology and subject approach to self-development of the personality is widely used in Russian psychology. Due to this approach a person being a subject of his or her life and activity independently determines his or her goals and development vector, taking into account outer circumstances and life conditions (Abul'hanova-Slavskaya, 1991; Karpinsky, 2002; Shchukina, 2018). Such theories understood personality as an organizing, managing and directing functional center, providing self-determined (intentional) nature of self-development.

The concept of intentional self-development (ISD) is a part of positive psychology where ISD is seen as a process of personal growth in which one intentionally takes actions that are designed to shape one's self-identity and personality (Bauer, 2009). As Bauer (ibid, p.523) points out, "central to ISD are personal goals, actions, concepts of self, and the interpretive processes through which the individual comes to generate and evaluate goals, actions, and selves".

Contemporary studies of intentional self-development highlight different interpretations of this phenomenon: as a process of personal growth or as a form of self-regulation. In studying intentional self-development as a process of personal growth different researchers highlight significant points, such as: shaping one's self-identity and personality (Bauer, 2009); developing a clear and integrated sense of self and accepting oneself with a positive view (Chickering and Reisser, 1993); improving self-esteem and self-concept clarity (Yang and Brown, 2016). Researchers see intentional self-development as an important process in ensuring well-being (Brandtstädter, 1999), and improving both cognitive and affective abilities (Morf and Horvath, 2010). Hereby self-development can be seen as an individual development determined by inner factors. On the other hand, self-development is one of the person's activities, so it can be considered as self-regulation in which people act, reach goals, observe outcomes and adjust these goals and

activities (Bauer, 2009; Brandtstädter, 1999; Morf and Horvath, 2010). Brandtstädter (2009) views self-regulation and self-cultivation as a process in which people are engaged in selective and self-regulatory activities making intentional efforts to achieve or maintain personally valued developmental states or outcomes. It is also a process aimed towards harmonizing personal goals (Gestsdottir and Lerner, 2008), managing life events that leads to qualitative changes of a personality (Shchukina, 2018). Taking into account the complexity of intentional self-development process, we consider it from two viewpoints: the first point indicates motivation and other personal characteristics as significant inner factors of initiation and regulation of self-development; the second point indicates a person's activity as goal-oriented actions in self-development.

1.2. Inner Factors of Self-Development

One of the key points in the concept of self-development is the inner factors promoting the efficacy of self-development. Growth goals and intrinsic motivation play major role in self-development (Bauer and McAdams, 2004). Nizovskikh (2008) described a variety of motives for self-development like imitation, need in love, recognition, self - cognition, self - understanding, self - affirmation, self-improvement, self - ful-fillment, etc. Dimensions of identity formation, goal effort, and mastery goal orientations accentuate motives for self-development and self-improvement (Flunger et al. 2016). Self-development and its components correlate with not only motivation but with various personal characteristics. Ito and Kodama (2016) found out that sense of authenticity increased all kinds of intentional self-development (autonomy, self-cultivating motivation, and self-improvement motivation); contingent self-esteem increased self-improvement motivation. Brandtstädter (1999) states that reflective thought, intentional control of behaviors and goal achievement strategies are central processes that help create the desired change in behavior.

Considering self-development activity of a person (external and internal) plays a major role in it. According to Pappas and Pappas (2011) individuals in the process of self-development need to create a workable plan to be executed over a pre-determined period of time, to monitor progress, to reflect upon and evaluate progress, and to adjust the plan according to the relative successes or failures of the plan. The subjective interpretations of goals, self, actions including interpretations of one's own past and future are key to the process of intentional self-development (Bauer, 2009). In general, we may state that a person is an active agent in his or her own development. Self-development initiation and performance are enhanced by growth goals, intrinsic motivation, reflexivity, sense of authenticity, creation of a life plan, self-understanding, and interpretations of one's own actions.

1.3. Life course Conception as Self-Development Factor

As mentioned above, self-development is based on a person's self-awareness, interpretation of one's life priorities, goals, time perspective, i.e. person's numerous subjective ideas about one's whole life or conception of the life course. Life course conception reflects the most significant moments or events, which are connected to a person's main life purposes (Karpinsky, 2002). The notion of "life course conception" as person's ideas about their own lives is not sufficiently studied. Two overlapping scientific fields – life course sociology and lifespan developmental psychology focus on individual development and its factors (Diewald and Mayer, 2009). Authors of sociological and psychological works use the term "life course perspective" or "life course approach" which considers life events, person's roles and person's development from the date of birth till the date of death historically and socioeconomically (Crosnoe and Elder, 2015). Unlike "life course perspective" the notion of "life course conception" does not give objective description of life events but it gives mental representations of life course and subjective aspects of life perception. These subjective aspects of life perception as well as objective life events could be considered as factors influencing individual's behavior and development (Karpinsky, 2002).

The ideas about life course denote several patterns of life time (what happened in the past, the current situation, and future perspectives), based on personal values, beliefs, interests, intention, life orientations and life events (Lyz and Prima, 2009). We consider the subjective life course conception in two dimensions: temporal (ideas about

life periods – the past, present, future time perspective) and composed (cognitive, emotional, and semantic components). Cognitive component includes attitude to life events, awareness of interrelation between those events, understanding the originality of one's own life, anticipation, and planning of the future life. Emotional component reflects emotional aspects of person's ideas about life. Semantic component includes person's consideration about life events and future life plans from the point of view of the significance (as a motivational factor) of those events and plans (Prima, 2011). We suggest that a person's life course conception is closely interrelated with the aspects of self-development. Thereafter we suppose that the improvement of student's life conception and formation of meaningful ideas about their own life are able to actualize self-development.

Based on this theoretical framework, we investigated two research questions:

• What is the role of subjective life course conception in students' self-development? What are peculiarities in self-development of students with mature and diffuse life course conception?

• Is it possible to enhance self-development of engineering students improving their life course conception?

2. MATERIALS AND METHODS

Two hundred and fifteen participants, 153 male and 62 female, aged from 17 to 22 (average 18,5), took part in the study. All participants are students of the Institute of Computer Technologies and Information Security studying Engineering (Information Technologies in particular).

Since the life course and self-development concepts are complex and not sufficiently and conclusively studied, an empiric research was carried out in three steps, as follows:

• single out components and indicators (primary and integrated) on the basis of theoretical analyses of life course conception and self-development;

• select measures, develop and test appropriate questionnaires to diagnose those components and indicators;

• state and validate assessment criteria for integrated indicators (high, middle, and low levels).

The key points and indicators in studying intentional self-development were:

• readiness for self-development (goal orientation in self-development, self-regulation skills);

• significance of self-development (values and semantic bases of the attitude to self-development, importance and the degree of priority of self-development among other spheres of life);

• activity in the process of self-development (professional skills development, improving communication style, widening one's cultural outlook, knowledge digestion, planning development, anticipating and overcoming difficulties);

• reflection on self-development (tendency to be self-aware, seeking a feedback to one's activity, awareness of other people influence on one's development, analysis of one's own feelings and experiences, assessment of one's own improvement);

• intrinsic motivation of self-development (intention to become a high-skilled professional, to widen one's life perspectives and goals, to get rid of one's own deficiencies, and to gain moral and physical perfection);

• self-development incentives (interest towards the future profession, desire to gain reputation, to be the first in his/her group, to get a reward for one's activity, to widen one's life perspectives and goals, to get rid of one's own deficiencies, to avoid any criticism from others, intention to gain approval of or to get to the same level as their team members, sense of duty or obligation to people who matter, aspiration to live healthy lifestyle, fear of inevitable assessments and exams).

To assess self-development we used two specific tests called "Person's need of self-development" and "Integrative test of self-improvement in a professional field" (Istratova and Eksakusto, 2010) and a special questionnaire titled "Activity in self-development" (Prima, 2011). The "Person's need in self-development" test is formed as Likert scale and diagnoses personal attitude towards self-development (importance, necessity, and possibility). The "Integrative test of self-improvement in professional field" evaluates personal intention (inner motivation), self-development incentives, and activity in self-development process. The "Activity in self-development" questionnaire determines self-development skills, reflection, and control in self-development process due to the subjective assessment of the respondents. The questions in the questionnaire were about the directions in which participants

are working on them-selves, factors that motivate them to engage in self-development and difficulties that they face on the way of changing themselves.

In studying life course conception three key components (semantic, emotional, and cognitive) formed the bedrock of it. The semantic component of life course conception was measured by Goal Orientation Test (Leontyev, 1993), Motivation Induction Method (Nuttin, 1985). Test of Goal Orientation is an adapted version of Purpose-in-Life Test (Crumbaugh and Maholick, 1964). On the basis of factor analyses five sub-scales are pointed out. They reflect three major existential orientations (past, present, and future) and two aspects of locus control (Leontyev, 1993). Motivation Induction Method is a measure of unaccomplished sentences. It helps diagnose motivational objects on the bases of person's intentions, ideas, anxieties which he or she puts in words. In our research this method was employed to find out respondents' dominant spheres of life activity by means of content analyses.

The emotional component was assessed by Time Orientations Scale (Nuttin, 1985). This scale diagnoses individual's attitudes towards the past, the present and the future. Cognitive component was measured by a specific questionnaire, which contained instructions and questions narrowed towards the life course conception and expected responses in a free form of a short essay (Prima, 2011). The questionnaire consists of 12 questions and implies both - free answers and optional answers. The questions were about the past (e.g. list significant past events, due to what factors those events happened and describe the way they influenced your life), the present (e.g. which life goals are the most important for you in the present time) and the future (e.g. describe future steps which you will do to achieve future goals). Focusing on our goal, we arranged the questions in such a way that the answers could reflect the student's ideas regarding of how their life events linked within the past and present / future. We were also interested in the comparability of the results with the scales of other methods used.

The indicators of the life course conception are:

• consistency of the life course conception (an integrity of cognitive component of the life course conception, understanding of the life-time process in general and life events in their interrelation);

• perception of significant past achievements (past achievements which made an impact on other life events);

• attitude to oneself as a source of life events and achievements (internal locus of control);

• extension of future time perspective (certain period of time which is needed to fulfil plans, long-term perspectives);

• ideas in details (how detailed these ideas can be, life plans and awareness of completing certain actions for their implementation);

• effectiveness of life course ideas (the presence of definite life sense and relevance of life plans to it);

• balance of life course ideas (the consistency of life plans with dominant spheres of life activity).

In analyzing the life course conception our aim was to avoid evaluating the content of events, goals, plans, etc. but rather estimate the degree of maturity, consistency, detailing by means of the above-mentioned indicators. To that end some initial data was compared and assessed due to special criteria. For example, dealing with the 'balance of life course ideas' indicator an expert compared respondent's life plans (which were written in the questionnaire) with the dominant life spheres (which were revealed by means of Motivation Induction Method). We determined the level of intensity of this indicator (high, medium, low) on the basis of formalized criteria (Prima, 2011). The initial results on self-development and the life course conception based on the above-mentioned measures were transformed into a data matrix comprising 72 primary and 13 integrated indicators of studied parameters for each respondent (n=215).

The empirical research included two definite phases (Phase 1 and Phase 2). The main purpose of the First Phase was to examine if there was coherence of two analyzed constructs – the life course conception and intentional self-development. The constructs were so complicated and the importance of their characteristics both quantitative and qualitative, was so high that we took an indirect approach using the method of contrasting groups to determine their relationship. To validate the research the data was analyzed in two ways: first, we searched for the differences in indicators of self-development among students who had different levels of the life course conception (maturity and diffuse levels) (Phase 1.1); second, we studied the differences in the life course conception among students with different attitude to self-development like goal-oriented or spontaneous

(Phase 1.2). F-distribution was used to define the differences statistically. In Phase 2 we implemented the "Life course conception" programme dedicated to improvement of students' life course conception and simultaneously, we studied changes in indicators of self-development as well as of the life course conception. Fifty students (33 male, 17 female) agreed to take part in this programme. Those respondents had mainly middle level of integrated indicators of self-development and the life course conception. Fifty of the same gender students were in the control group. There were no valid differences in studying indicators between the samples. The statistical analysis of data was made twice: once before and once after completion of the programme. The calculation of T-Wilcoxon test was used to rate the intensity of data shift – the direction and severity of available changes.

The "Life course conception" programme included student group sessions, individual work, and group training. It took 18 weeks to complete the 36-hour course. The main topics of the course were: my opportunities, the others and I, my past, my present, my life goals, professional carrier, the way into the future. We used educational and psychological methods for the reflexive activity; students' work on their life plans and ideas of the life course (past, present and future); help in goal orientation and life plans detailing. In order to enhance engineering students' self-awareness psychometric tests (personal questionnaires) and some elements of psychological training (games and exercises on inter perception, leadership, and interaction) were used. It helped students to clarify and perceive their personal and professional characteristics. Understanding of social requirements in the contemporary world and professional skills was improved in discussions. By means of written reflections (essays) students analyzed their experience, understood their meaningful achievements, needs, intentions and life goals. To find causal connection linking life events and to create their own time perspective the students designed and implemented a special project. This project also helped the students to see themselves as managers of their own lives. In addition, the group session provided a forum for mutual exchange of participants' experiences.

3. RESULTS

During Phase 1 the data of the whole group was overviewed to mark two contrasting groups of students with mature and diffuse life course conception (n1=35, n2=45). The first group consisted of students with high and middle levels of integrated indicators. The second group consisted of students with low and middle levels of integrated indicators. The results of the rest of respondents were excluded from the analysis at this stage. The conception of life course of the first group students could be described as consistent, holistic, effective, detailed, balanced, and meaningful; students of this group realized the importance of their own life achievements, considered themselves as the main source of life events. Life course conception of the second group (with diffuse ideas) carried the following characteristics: the system of life ideas was less organized; the level of experience awareness was low; the lack of life goal orientation; uncertainty of person's activity to achieve goals; the mismatch of life goals and priorities in life spheres.

Comparative analysis of intentional self-development between students with mature (group 1) and diffuse (group 2) life course ideas using F-distribution was made. The indicators which showed statistical significant differences are presented in [Table 1] below.

Table 1. Indicators of self-development for students with mature and diffuse life course conception

Self-development indicators	Percentage indication (%)		F-distrib.
	group 1	group 2	
Tendency to self-awareness	37.1	4.4	φ*=3.875 (p≤0.01)
Seeking a feedback to one's activity	40.0	11.1	φ*=2.101 (p≤0.01)
Awareness of other people influence on one's development	37.1	15.6	φ*=1.255 (p≤0.05)
Intention to become a highly skilled professional	34.3	13.3	φ*=1.925 (p≤0.05)
An interest towards the future profession	51.4	33.3	φ*=1.833 (p≤0.05)
Intention to gain good reputation	48.6	24.4	φ*=2.485 (p≤0.01)
Intention to be at the top	62.9	28.9	φ*=4.955 (p≤0,01);
Intention to get a reward for one's activity	34.3	15.6	φ*=1.653 (p≤0,05)
Intention to widen one's life perspectives and goals	42.9	28.9	φ*=1.969 (p≤0,05)
Intention to get rid of one's own deficiencies	54.3	40.0	φ*=2.706 (p≤0,01)
Intention to avoid any criticism from others in the process of study	22.9	40.0	φ*=1.655 (p≤0.05)
Improving communication style	40.0	60.0	φ*=2.229 (p≤0.01)
Widening one's cultural outlook	22.9	33.3	φ*=1.689 (p≤0.05)

The differences from Table 1 indicate the following characteristics of students:

• the number of students showing significance of self-awareness is higher in the group with mature life course conception than in the other group;

• reflection on self-development (seeking a feedback to one's activity, awareness of other people influence on one's development) is more common for students with mature life course conception, rather than to those, whose life ideas are diffuse;

• students with mature life course conception more often have inner motives to self-development (interest towards future profession, intention to become a highly skilled professional and to widen one's life perspectives and goals);

• students with mature life course conception usually have competitive motives: in comparison with the other group they have a better defined intention to gain good reputation and take the first place among others;

• one of the most valuable rewards for students with mature life course conception is approval from others, praise, financial incentives (students of this group are oriented not only towards their personal growth, but also towards other profits and benefits);

• the number of students with mature life course conception who are oriented to get rid of their own deficiencies is higher than the number of students from the other group;

• students with diffuse life course ideas tend to study mostly with a sense of duty or obligation to people who matter trying to avoid criticism;

• according to self-development activity, students with diffuse life course ideas tend to study in the sphere of culture, communication and cooperation with others.

After completion of Phase 1.1 we formed two new contrasting groups out of the whole number of participants. The first group included students with goal-oriented self-development, the second group included students, whose self-development was spontaneous (without any valuable inner reflection or process control) (n1=34, n2=29). These groups have verified differences in the majority of studied indicators: readiness for self-development, activity in self-development, reflection of self-development, and intrinsic motivation.

Results describing the life course conception for students with goal-oriented and spontaneous self-development are shown in [Table 2] below.

Table 2. Indicators of the life course conception for students with goal-oriented and spontaneous self-development

Indicator of the life course conception	Goal-oriented self-development			Spontaneous self-development		
	Percentage indication (%)					
	High lvl	Mid. lvl	Low lvl	High lvl	Mid. lvl	Low lvl
1. Consistency of the life course conception	20.6	17.6	61.8	6.9	13.8	79.3
2. Perception of significant past achievements	23.5	23.5	52.9	44.8	27.6	27.6
3. Attitude to oneself as a source of life events and achievements	55.9	26.5	17.6	31.0	24.1	44.8
4. Extension of future time perspective	11.8	55.9	32.4	20.7	37.9	41.4
5. Ideas in details (how detailed they are)	47.1	17.6	35.3	27.6	10.3	62.1
6. Effectiveness of life course ideas	61.8	20.6	17.6	31.0	34.5	34.5
7. Balance of life course ideas	52.9	20.6	26.5	31.0	20.7	48.3

The comparative analysis of the life course conception made in two groups revealed the following significant differences:

• the significance of past achievements is higher to the students with spontaneous self-development ($\varphi^* = 4.525$, $p \leq 0.01$);

• the life course conception of students with spontaneous self-development is mostly less detailed ($\varphi^* = 4.264$, $p \leq 0.01$), than in the other group; there is a mismatch in goals and future plans of students with spontaneous self-development;

• the majority of students with goal-oriented self-development can be characterized as a group with high effectiveness of life course ideas ($\varphi^* = 5.084$, $p \leq 0.01$). Unlike participants from the other group (with spontaneous self-development), they mostly have a certain life sense which causes rather meaningful life plans;

• the number of students with goal-oriented self-development who have balanced life course ideas is higher than the number of the students with spontaneous self-development ($\varphi^* = 4.371$, $p \leq 0.01$).

In Phase 2 the above-mentioned indicators of self-development and the life course conception were studied twice: once before commencement of the "Life course conception" programme and once after its completion. The results of the study of student's life course conception revealed positive trend in a large number of studied indicators, such as the perception of significant past achievements ($T=10$, $p \leq 0.01$), attitude to oneself as a source of life events and achievements ($T=24.5$, $p \leq 0.01$), extension of future time perspective ($T=11$, $p \leq 0.01$), ideas in details ($T=8$, $p \leq 0.01$), balance of life course ideas ($T=6$, $p \leq 0.01$) and consistency of the life course conception ($T=8.5$, $p \leq 0.01$). Moreover, we pointed out an increased level of integral indicators of self-development: significance of self-development ($T=5.5$, $p \leq 0.01$); activity in self-development process ($T=24.0$, $p \leq 0.01$); reflection of self-development ($T=28.5$, $p \leq 0.01$); intrinsic motivation of self-development ($T=30.0$, $p \leq 0.01$); readiness for self-development ($T=7.5$, $p \leq 0.01$). In the control group statistically valid differences were found out in only one indicator: reflection of self-development ($T=7.4$, $p \leq 0.01$).

4. DISCUSSIONS

According to the results obtained by research student's self-development can be characterized as following: students with the mature life course concept in comparison with those, whose life ideas are diffuse, show intention towards self-reflection and self-awareness, and desire to improve them-selves. It is suggested that self-awareness promotes a holistic view on the life course and future perspectives, which in its turn enhances intention to self-develop. Students with the mature life course conception are more likely to have an intention to become highly skilled professionals, an intention to widen their life perspectives and goals, an intention to secure leadership position, and have interest in their professional future. However, their activity in self-development is initiated not only by internal, but also by external motives related to search of different benefits, a need for

approval or reward (either moral or material), and competition with other group members.

Self-development of students with the diffuse life course conception is mostly initiated by external causes related to social environment and significant others, such as intention to avoid criticism and sense of duty. These students are likely to entrust their life course choice and decision-making activity to others. They are engaged in cultural development activity and improvement of their outlook and communication style in the process of self-development. According to these facts we may assume that these students are not able to identify their essential vector of self-development, because they lack significant life goals and they are not fully aware of their lives' perspectives.

Those students who are aware of the importance of self-development and have intrinsic motivation are more likely to believe in their own ability to manage their life events. Life course conception of students with goal-oriented self-development is more detailed, effective, and balanced. This means that the existence of long term plans and awareness of actions that will bring them about are correlated. These students are more likely to self-develop according to their life aspirations, needs and intentions. They have a definite sense of their future and the relevance of their plans, and of consistency of their life plans with dominant spheres of their life activity. We conjecture that this holistic life course conception along with definite life goals enhances intention and creation of self-development programme. Students who understand the importance of self-development and have an intrinsic motivation are more likely to appreciate life opportunities, they are prone to see future perspectives and estimate the present as an important period of life. The students with spontaneous self-development give more significance to past achievements. That means that they highly evaluate their past efforts and achievements but are not yet ready to set their self-development goals. Whereas, people with goal-oriented self-development, tend to devalue their past efforts and achievements (possibly it may occur due to definitely planned future in detail).

The results of Phase 1 show that a small percentage of engineering students in the whole sample group has a high maturity level of the life course conception and goal-oriented self-development (16.3% and 15.8%, respectively). The ideas of life course are considered to be flexible and amenable to purposeful development. That is why the life course conception was chosen as an object of pedagogical influence. The idea of the life course conception improvement and students' self-development enhancement was studied by means of the "Life course Conception" programme. The results showed that students' conception of life course became more consistent, balanced and detailed. Having accomplished the programme the students, on the one hand, paid more attention to themselves as a source of life events, to significant past achievements and future plans, and, on the other hand, intensified self-development in the following categories: significance, activity, reflection, inner motivation and readiness for self-development. Taking into account the fact that self-development was influenced indirectly (by the program that improves the life course conception) the effect can be seen as positive.

Gained results affirm the idea that self-development initiation and performance are enhanced by growth goals cohered with the life goals, intrinsic motivation, reflexivity, creation of a life plan, and one's own relevant actions (Bauer and McAdams, 2004; Bauer, 2009; Pappas and Pappas, 2011). The study confirms that the subjective life course conception plays a great role in self-development of engineering students and by improving it self-development can be enhanced.

5. CONCLUSIONS

This research has "an investigative" character and therefore has some limitations. Firstly, the sample group size is not very big. Secondly, we used questionnaires based on the subjective opinions of students and indirect approach to the study of relationship between self-development and the life course conception. Nevertheless, reliability of the results and validity of the findings are proved by triple analysis: comparing contrast groups with different the life course conception; comparing contrast groups with different self-development; and checking changes in self-development in the situations when the life course conception was influenced. This research does not show strong characteristics of relationship between self-development and the life course conception. However, the results obtained give us an idea what to do further and allow us to draw the following conclusions.

The maturity of a student's life course

conception, their awareness of experience and future goals, understanding of significant life achievements, attitude to oneself as a source of life events and achievements (internal locus of control), and thoughtful actions in goal pursuit promote a readiness for self-development, intrinsic motivation, and activity in self-development. Thus, the main role of life course conception is to actualize intrinsic motivation that makes self-development personally meaningful and goal-oriented. In other words, intention to self-development appears in case when a person has significant life goals and perspec-tives which may be reached through self-transformation.

To actualize students' self-development, we implemented the "Life course conception" programme which purposefully extended life course ideas and helped making those ideas integrate. We used educational and psychological methods providing reflexive activity; students' work on their life plans and ideas of life course (past, present, and future); self-awareness, goal orientation and life plans detailing. Due to this programme the students improved not only the life course conception but self-development either. It is extremely important to engineer-ing students because they often show the lack of interpersonal and intrapersonal skills. According to Alpay and Ireson (2006) opportunities to re-address any fixed (limiting) self-beliefs of engineering students may improve the efficacy of any subsequent skills training programme. That is why we presume that improvement of life course conception enhances students' self-development as well as further professional skills training.

One of the prospective questions that needs to be addressed is how to develop non-technical skills in technical students? These skills have an inherent complexity and are difficult to pass with traditional means, which makes it complicated to learn as well as to teach them (Emilsson and Lilje, 2008). There is a certain experience in dealing with this problem, i.e. there are special psychological courses in engineering programmes, for ex-ample, "Higher Order Thinking in Science and Technology" (Pappas and Pappas, 2011), "Psychology for Engineers" (Alpay and Ireson, 2006). Our approach is also based on referring to a psychological course, involving reflective, psycho-diagnostic, and training methods. Teaching was based upon principles of person-centered education. It means that students' individuality, interests and purposes were taken into account, and the processes of their self-awareness and self-determination were supported to widen new opportunities in personal and professional self-development. The results of the study can be implemented in development of engineering programmes' using appropriate methods for facilitation of students' self-development.

ACKNOWLEDGEMENTS

The research was financially supported by the Southern Federal University.

Conflict of interests

The authors declare no conflict of interest.

REFERENCES

Abul'Khanova-Slavskaya, K.A. (1991). Стратегия жизни [Strategiya Zhizni]. Москва: Мысль. Retrieved October 25, 2019, from http://rubinstein-society.ru/cntnt/nauchnie-raboti/raboti-k-a-abulh/strategiya.html

Alpay, E., & Ireson, J. (2006). Self-theories of intelligence of engineering students. *European Journal of Engineering Education, 31(2)*, 169-180. https://doi.org/10.1080/03043790600567027

Bauer, J. J. (2009). Intentional self-development. In J. Lopez (Ed.), The Encyclopedia of positive psychology (pp. 523-527). Malden: Wiley-Blackwell. https://doi.org/10.1002/9781444306002.ch9

Bauer, J. J., & McAdams, D. P. (2004). Growth goals, maturity, and well-being. *Developmental Psy-chology, 40(1),* 114-127. https://doi.org/10.1037/0012-1649.40.1.114

Brandtstädter, J. (1999). The self in action and development: Cultural, biosocial, and ontogenetic bases of intentional self-development. In J. Brandtstädter & R. M. Lerner, *Action & self-development: Theory and research through the life span* (pp. 37-65). Sage Publi-cations, Inc. https://doi.org/10.4135/9781452204802.n2

Brandtstädter, J. (2009). Goal pursuit and goal adjustment: self-regulation and intentional self-development in changing developmental contexts. *Advances in Life Course Research, 14(1-2),* 52-62. https://doi.org/10.1016/j.alcr.2009.03.002

Chickering, A. W., & Reisser, L. (1993). *Education and Identity* (2nd ed.). San Francisco: Jossey-Bass. Retrieved from ERIC database. (ED423498) https://eric.ed.gov/?id=ED423498

Crumbaugh, J. C., & Maholick, L. T. (1964). An experimental study in existentialism: The psychometric approach to Frankl's concept of noogenicneurosis. *Journal of Clinical Psychology, 20(2),* 200-207. https://doi.org/10.1002/1097-4679(196404)20:2<200::AID-JCLP2270200203>3.0.CO;2-U

Crosnoe, R., & Elder, G. H. (2015). Life Course: Sociological Aspects. In: J. D. Wright (Ed.),

International Encyclopedia of the Social & Behavioral Sciences (Second Edition) (pp. 80-84). Amsterdam: Elsevier. https://doi.org/10.1016/B978-0-08-097086-8.34037-5

Diewald, M., & Mayer, K.U. (2009). The sociology of the life course and life span psychology: Integrated paradigm or complementing pathways? *Advances in Life Course Research, 14(1-2),* 5-14. https://doi.org/10.1016/j.alcr.2009.03.001

Emilsson, U. M., & Lilje, B. (2008). Training social competence in engineering education: necessary, possible or not even desirable? An explorative study from a surveying education programme. *European Journal of Engineering Education, 33(3)*, 259-269. https://doi.org/10.1080/03043790802088376

Flunger, B., Marttinen, E., Tuominen-Soini, H., & Salmela-Aro, K. (2016). How do young adults orchestrate their multiple achievement-related goals? Associations of achievement goal orientations with identity formation and goal appraisals. *Research in Human Development, 13(4)*, 342-362. https://doi.org/10.1080/15427609.2016.1234309

Gestsdottir, S., & Lerner, R. M. (2008). Positive development in adolescence: The development and role of intentional self-regulation. *Human Development, 51(3),* 202-224. https://doi.org/10.1159/000135757

Istratova, O. N., & Eksakusto, T. V. (2010). *Справочник психолога-консультанта организации* (3-е издание) [Handbook of the Psychologist Consultant of the Organization (3th ed.)]. Ростов-на-Дону: Феникс. https://elibrary.ru/item.asp?id=20105686

Ito, M., & Kodama, M. (2006). Self-feelings that support intentional self-development in university students: sense of authenticity and global and contingent self-esteem. *Japanese Journal of Educational Psychology, 54(2),* 222-232. https://doi.org/10.5926/jjep1953.54.2_222

Karpinsky, K.V. (2002). Человек как субъект жизни [A person as a subject of life]. Гродно: Издво ГрГУ. Retrieved September 28, 2018, from https://www.psyoffice.ru/3788-karpinskijj-k.v.-chelovek-kak-subekt-zhizni..html

Kibal'chenko, I. A., & Eksakusto, T. V. (2019). Modern students' mental representations of success. *International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE), 7(1),* 1-13. https://doi.org/10.5937/ijcrsee1901001K

Leontyev, D. A. (1993). *Тест смысложизненных ориентаций: Методическое руководство* [Purpose-in-Life Test: Tutorial Materials]. Москва: Смысл. Retrieved September 3, 2017, from http://publishing.smysl.ru/book/sgo/ManSGO.pdf

Lyz, N. A. (2012). The educational competence of college students as a factor of the quality of higher education. *Russian Education and Society, 54(6)*, 80-95. https://doi.org/10.2753/RES1060-9393540605

Lyz, N., & Opryshko, A. (2016). Life-creating education: new educational meanings in modern world. *On the Horizon, 24(4),* 377-386. https://doi.org/10.1108/OTH-06-2016-0028

Lyz, N. A., & Poznina, N. A. (2010). Педагогические риски технизированных образовательных сред [Teaching risks of technicalized educational environment]. *Pedagogics, 4*, 33-42. https://elibrary.ru/item.asp?id=15175361

Lyz, N. A., & Prima, A. K. (2009). К проблеме изучения представлений о жизненном пути как характеристики субъекта жизни [To the problem of studying life course conception as an attribute of life subject]. In А.Л. Журавлев, В.А. Барабанщиков, & М.И. Воловикова (Eds.), *Психология человека в современном мире.* (pp. 248-255). Москва: Изд-во «Институт психологии РАН». Retrieved September 28, 2018, from http://www.ipras.ru/engine/documents/document2001.pdf

McCann, L. I., & Pearlman, L. A. (1992). Constructivist self-development theory: A theoretical framework for assessing and treating traumatized college students. *Journal of American College Health, 40(4)*, 189–196. https://doi.org/10.1080/07448481.1992.9936281

Mirzagitova, A. L., & Akhmetov, L. G. (2015). Self-development of pedagogical competence of future teacher. *International Education Studies, 8(3),* 114-121. https://doi.org/10.5539/ies.v8n3p114

Morf, C., & Horvath, S. (2010). Self-Regulation pro-cesses and their signatures: Dynamics of the self-system. In R. Hoyle, *Handbook of per-sonality and self-regulation* (pp. 117-144). Malden: Wiley-Blackwell. https://doi.org/10.1002/9781444318111.ch6

Nizovskikh, N. A. (2008). Мотивация саморазвития человека [Motivation of person's self-development]. *Вестник Вятского государственного университета, 1(1),* 113-120. Retrieved March 31, 2018, from https://cyberleninka.ru/article/n/motivatsiya-samorazvitiya-cheloveka

Nuttin, J. (Ed.). (1985). *Future Time Perspective and Motivation: Theory and Research Method.* Leuven: Univ. Pr.

Pappas, E., & Pappas, J. (2011). Behavioral approach to building cognitive foundations for effective thought and action. *Innovative Higher Education, 36(5),* 359-372. https://doi.org/10.1007/s10755-011-9178-8

Perez, T., Cromley, J., & Kaplan, A. (2014). The role of identity development, values, and costs in college STEM retention. *Journal of Educational Psychology, 106(1)*, 315-329. https://doi.org/10.1037/a0034027

Prima, A. K. (2011). Представления о жизненном пути в структуре субъектности студентов вуза [The life span conception as a part of inner activity structure of university students]. *Известия Южного федерального университета. Педагогические науки, 4,* 122-130. Retrieved March 31, 2018, from http://pedsciencemag.ddk.com.ru/bulletin/pdfVersion?articleIdd=1023

Rasoal, C., Danielsson, H., & Jungert, T. (2012). Empathy among students in engineering programmes. *European Journal of Engineering Education, 37(5),* 427-435. https://doi.org/10.1080/03043797.2012.708720

Shchukina, M. A. (2018). Heuristics of the subject approach in the psychological consciousness of personal self-development. *Psikhologicheskii Zhurnal, 39(2),* 48-57. https://doi.org/10.7868/S0205959218020058

Stiwne, E. E., & Jungert, T. (2010). Engineering

students' experiences of transition from study to work. *Journal of Education and Work, 23(5),* 417-437. https://doi.org/10.1080/13639080.2010.515967

Yang, C. C., & Brown, B. B. (2016). Online self-presentation on Facebook and self development during the college transition. J*ournal of Youth and Adolescence, 45(2),* 402-416. https://doi.org/10.1007/s10964-015-0385-y

Milenkova, V., & Kovacheva, S. (2020). Youth and the skills system in Bulgaria. Can lifelong learning policies on the regional level compensate for the mismatches in the national skill system?, *International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE), 8(1),* 49-60

YOUTH AND THE SKILLS SYSTEM IN BULGARIA. CAN LIFELONG LEARNING POLICIES ON THE REGIONAL LEVEL COMPENSATE FOR THE MISMATCHES IN THE NATIONAL SKILL SYSTEM?

Dr. Valentina Milenkova, South-West University, Bulgaria
E-mail: vmilenkova@gmail.com
Dr. Siyka Kovacheva, Plovdiv University, Bulgaria
E-mail: siykakovacheva@gmail.com

ARTICLE INFO

Original Research
Received: January, 28.2020.
Revised: March, 09.2020.
Accepted: March, 17.2020.
doi: 10.5937/IJCRSEE2001049M

UDK
37.014.48-053.81(497.2)

Keywords:
young adults,
youth transitions,
skills system,
lifelong learning policies,
Bulgaria,
regional context .

ABSTRACT

The present article is a study of the opportunities and constraints for youth transitions from education to employment vis-a-vi the structural relationships (of compliance and discrepancy) between the sectors of education, training and the labor market. The analysis examines the deficiencies in the coordination of the demand and supply of skills in Bulgaria, which hinder the successful employment integration of the current young generation. The mismatches in the system are highlighted on the national and the regional level where we focus on the contextual cases of Blagoevgrad and Plovdiv functional regions. The paper reveals that there is a discrepancy between labor supply and demand in the skills systems in both regions where less than half of university graduates work in the specialty they have acquired during studies. One of the conclusions of the study is that social changes under way require new strategies and approaches of lifelong learning policies that should go deeper into the regional and local level taking into account both the needs of young people for training throughout their lives and the needs of the regional labor markets.

1. INTRODUCTION

An increasing number of young people in Bulgaria, similar to their peers in Europe, entering the labor market after graduating from secondary and higher education are faced with problems in finding a job. They have difficulty coping with this challenge because they do not have the necessary skills and practical training. They enter the labor market with great expectations but are unprepared for reality. Therefore, employability is a key indicator of the effectiveness of educational institutions and is expressed in the acquired qualifications and skills of graduates to achieve labor market competitiveness in a regional, national and global context. Employability has a direct impact on the performance of a young person at the start of a job (Benneworth, 2010), and, in accordance with the qualifications, qualities and training achieved, it is related to the ability to adapt and accelerate knowledge, to self-discipline and motivation, and to skills teamwork (McLoughlin and Luca, 2002), that have impact as transferable skills.

The present article is a study of the opportunities and constraints for youth transitions from education to employment vis-a-vi the structural relationships (of compliance and discrepancy) and the link between knowledge, attainment of qualifications, and the labor market sectors. There are various institutions which develop skills and interact with different social actors who have the potential and resources to influence the process of training young adults and their entry into the labor market. The main research questions are: How lifelong learning policies can help young adults transition from training

Corresponding Author
Dr.Valentina Milenkova, South-West University, Bulgaria
E-mail: vmilenkova@gmail.com

to the labor market? and How is the mismatch between education and the job market shaping the expectations of social actors?

The aim of the analysis is to show the coordination of the seeking and offering skills carried out in the contemporary Bulgarian conditions, which represent a good basis for studying the research questions. This article seeks to address the issue of the development of effective programs that facilitate the integration of young people into dynamic contemporary labor markets. Our view is that similar programs that stimulate the transition from education to employment are a prerequisite for the successful reduction of the proportion of people who are vulnerable and socially distant.

In particular, the analysis is focused on the contextual cases of the Blagoevgrad and Plovdiv functional regions. The article presents the outcomes from the mapping of regional institutions that are responsible for the creation of skills ecology. Different organizations have varying degrees of participation in the process of skills formation. Educational institutions such as vocational schools, colleges and universities, vocational centers are most involved in training and skills formation. On the other hand, employment agencies and labor offices also participate in this process through the implementation of various programs aimed at developing the skills of young adults who have graduated but have no practical experience. An important role in the process of shaping and realizing skills have various business companies and their branch organizations, which are becoming important stakeholders. In this way, the skill system is formed and changes continuously depending on the actors taking part in it as well as from their efforts and activities. At the same time, the whole process takes place in a specific environment characterized by different economic and policy conditions, which also influence the skills system. The specific combination of actors, policies and beneficiaries in the structure of skills that are built, exist and manifest in regional / local conditions can be considered as local / regional ecology of skills (Parreira do Amaral and Kovacheva, 2019).

2. THEORETICAL FRAMEWORK

Theories which examine the discrepancy in skills ecology between education and labor market can be combined into two groups. The first group of theories emphasizes the essence of "non-compliance" as a phenomenon. Concrete aspects of the mismatch are being examined, the reasons for its existence, its origins and how it is expressed. The main focus is on the growth of global competition, the rapid technological change, the development of economy that give rise to the mismatch in the skills of people (Cedefop, 2010).

The thesis that skills mismatch refers not only to the lack of skills and knowledge, but also to the overeducation and overskilling of young people is being presented. The mismatch of skills requires time to resolve it, as well as expenses of individuals, business and government investments, taking into account the combination of skills and jobs and the provision of information about mismatches. The skills gap is a function of the level of work and its complexity, while the duration of skills gaps is linked to the need for retraining. In general, mismatch in skills is related to:

- The aging of skills in cases where technological change requires new abilities and knowledge; this can happen for a relatively short time in the working life of a person and can be overcome through the system of lifelong learning.
- "Overeducation" is a phenomenon when people are taking low-skilled jobs while continuing to look for better options for realization.

Skill gaps or even underskilling exist in cases where people do not have the necessary qualification and knowledge. The reasons connected to inadequate training, education and training systems that are not in line with market changes and business cycles.

Besides that, "Mismatch is more relevant for specific groups, such as young people entering the labour market, older workers, females, ethnic minorities and the disabled" (Cedefop, 2010: 7). The emphasis is on the fact that the gap between the structure of training and the needs of the labor market is a major factor to job instability and imbalances. This discrepancy can be seen as a mismatch between labor supply and demand and it creates prerequisite for reducing the adequacy of labor and the rational use of the human factor. As a consequence, the economy is placed in unfavorable situation related to the ineffectiveness of human resources and their potential. In addition, the gap between demand for and supply of skills blocks the growth of GDP and the overall development of society (Federation, Radovic and Djuraskovic, 2015).

This group of theories also studies the

specific sectors of the economy, as well as the nature of the necessary skills that will best and most adequately fit the individual sectors. Analyzes show that between 15 and almost 35% of those employed in European countries are either undereducated or over-educated, and it may be emphasized that under-education is a more common occurrence than the surplus of education (Morgado et al, 2015). More detailed studies based on representative surveys show a more systematic and comprehensive overview of the state of the labor market and its processes (Schomburg and Teichler 2007; Morgado et al, 2015; Cedefop, 2010). A key conclusion of this group of theories is the need to rethink policies on a European level, to seek adequate approaches in educational institutions, to become the real institutions of LLL, to rethink the concrete measures to update the correlation between training and the realization of young people.

The second group of theories shows the relationship between the individual aspect, emphasizing the individual abilities and the structural aspects related to the actions of institutions in which the personal and community life of the actors takes place. The main objective is to understand young people's market behavior in the institutional environment (Tholen, 2015; Tomlinson, 2017; Boyadjieva and Ilieva-Trichkova 2015), connected to looking for jobs which are relevant to education, skills and ambitions. Discrepancy in skills ecology shows dynamic discrepancy in the complex labor market and is often accompanied by inappropriate search for information, opinions, support; it can be a function of factors other than the type of completed education and specialty. The discrepancy may also be due to the influence of the community environment, the contacts and connections which the young person has built up, the lack of information, the market situation in the choice of education and profession, which are subsequently not relevant to the circumstances.

Lifelong learning is a broader concept than the development of skills and competences in a formal educational institution, which are then applied in the workplace. It refers to a learning process recurring over the whole life course of the individual as underlined in the 1996 UNESCO report (Delors et al, 1996). Since the early stages of the EU policy on lifelong learning (EC, 2000, 2001) the concept and the policies implementing it has expanded to include an understanding of a more humanistic and holistic process of acquiring knowledge, acknowledging the economic, political, cultural, and social needs the young people.

3. MATERIALS AND METHODS

The analysis builds upon the results of the project "YOUNG_ADULLLT – 'Policies Supporting Young Adullts in their Life Course', team coordinator Prof. Marcelo Parreira do Amaral, Ph.D., under the Horizon 2020 Program, 2016-2019. The study used mixed methods of data collection: analysis of official documents and 'grey' literature, quantitative data from Eurostat and other large-scale surveys, as well as local statistics and interviews in depth with policy makers, practitioners and young beneficiaries of life-long learning programs and initiatives. The research collected empirical data on different levels: global, national, regional and local. One of the important features of the project is its commitment to the functional region – a specific amalgam of functional relations between diverse institutions in a particular area (Parreira do Amaral and Kovacheva, 2019). The functional region as a key concept was used in the project to indicate specifics in terms of living conditions, education, institutions that form the skills of young people. It refers to a relational delineation of space that does not necessarily 'reflect geographical particularities or historical events' (OECD, 2016: 14). Rather the boundaries of a functional region are drawn to reflect the various processes, entities and mutual contacts that manifest themselves in their specific characteristics such as people, goods, energy, information, etc. (Klapka, Halás and Tonev, 2013: 2).

The project looked into the embeddedness of the policies in the regional economies and local labour markets in two regions in each of the project partner countries and aimed to study the potential of these policies to enhance young people's resources for developing and implementing their own life projects. The respondents were selected from a variety of LLL policies and projects implemented by public, private institutions and the non-governmental sector in nine European countries (Austria, Bulgaria, Croatia, Finland, Germany, Italy, Portugal, Spain, United Kingdom). The fieldwork consisted of semi-structured interviews with regional policy makers and street level professionals and of biographical interviews with young people current or former participants in the policy

measures. Between April and June 2017, a total of 21 interviews were conducted in Blagoevgrad Functional Region: 11 of them with experts and 10 with the young adults, participating in the four identified projects. Similar number of interviews were conducted in Plovdiv Functional Region (9 with professionals and 12 with young beneficiaries) following the commonly designed sample and interview schedule. In the interviews, the link between LLL programs and the living conditions of young people related to their life strategies was followed. The interviews focused on tracking LLL programs in relation to young people's needs, their potential and hidden resources as a prerequisite for their realization (Milenkova and Kovacheva, 2020).

Access to the young interviewees was secured through the institutions implementing measures related to lifelong learning. The interviews in both regions followed a common strategy starting with an open question prompting the interviewees to present themselves as they wished and tell stories about their lives and then focuses on more specific topics pertaining to their training, educational institutions, teachers, participation in life-long learning projects, job biographies, attempts to find a job, various significant events and personalities that have had a lasting impact on the decisions and transitions within their life projects and expectations. All interviews were fully transcribed and an extended summary in English was provided for each interview and shared among the consortium members. All interviews were coded according to the guidelines developed by Corbin and Strauss (1990).

This article also uses data from the NSI and Eurostat, which show the state of transition from education to employment of young people in Bulgarian conditions. Data from surveys conducted by the Bulgarian Chamber of Commerce, as well as surveys from the Ministry of Education and Science concerning the rating of universities and colleges in the country were used. The data provided are reliable and public and represent a legitimate basis for the conclusions and summaries made.

4. RESULTS

Lifelong learning policies target young people in a crucial life stage – at the time associated with the transition from education to work. Transitions is a major concept in sociology of youth which treats youth and young adulthood as a social construct rather than a universal phase of a biologically determined individual development. The key advantage of the 'transitions paradigm' according to Roberts (2018) lies in 'its ability to embed the study of youth within the longer life course'. Most researchers of youth trajectories highlight the changes in post-modern societies in which youth transitions become prolonged and destandardised due to growing risks and insecurity in all life domains (Walther, 2006, Stoilova and Nyagolov, 2016). Education-to-work, family and housing transitions often intermingle in young people's life trajectories and a failure in one type creates delays and disadvantages in the other types. Such trends have been established among young people in Bulgaria in the past few decades (Kovacheva, 2001, Stoilova and Nyagolov, 2016; Mitev et al, 2019).

With the transition from a totalitarian to a democratic and a market-oriented system in the country youth activity shifted radically from social and political life to the private economic sector. To date, the main challenges facing this group are the difficulties to find work, the insufficient income levels and the low quality of working conditions - as a sphere where the consequences of the economic crisis most directly felt. Young people in Bulgaria are one of the groups of young men and women that make the latest entry into the labor market compared to other EU countries (Eurofound, 2014). Similar to other countries in South and Eastern Europe, they face both structural and institutional barriers in front of their efforts to obtain quality employment (Boyadzieva and Ilieva-Trichkova, 2019). After completing their education, most of the young people in Bulgaria have no practical and working experience, which leads to their more difficult integration into the labor market. They often face the inability to accumulate work experience and fall into a vicious circle – they are not being hired because they do not have work experience, but they cannot accumulate work experience because they are not being hired.

According to NSI data, for the first quarter of 2018, the employed aged 15 - 64 were 3.02 million. The employment coefficient for the population in this age group is 66.5 per cent. Employment among the population aged 15-29 is 40.3 per cent, that is, less than the half of young adults are engaged in work (http://www.nsi.bg/bg/content).

In order to support the integration of

young people into the labor market, a number of projects and programs have been developed. Unfortunately, in most cases, they are short-term and cover a limited number of candidates. The period for which the programs are applied is usually between six months and a year and most often there are no follow-up projects, so the young fall back into unemployment. The clarification of the key stakeholders (Freeman, 1984), who influence the successful professional realization of young people, their roles and their functions and opportunities for impact, would be helpful in developing more sustainable measures.

The transition from education to employment is usually a period marked by shock and uncertainty when the graduates leave the structured academic environment and enter a new organizational environment where they are expected to quickly master completely different roles. The transition period may be of varying duration and go through different stages. The International Labor Organization describes it as transition of young people (15-29 years) from completing education to the first sustainable or satisfactory job.

The transition from higher education to professional realization is accompanied by various obstacles of a different nature. According to the latest results (2019) of the "Ranking System of Higher Education Institutions in Bulgaria" (https://rsvu.mon.bg/rsvu4/#/), most of the graduates of higher education do not work in their specialty and are employed in positions requiring lower qualification. The lowest is the employment of graduates in the "Tourism" specialty, less than a quarter of the tourism graduates work in their specialty. At the same time, interest in this specialty is high. There are similar low realizations in many other fields such as "Biological Sciences", "Chemical Sciences", "Animal Husbandry", "Crop Production", "Plant Protection", "History and Archeology", "Religion and Theology", "Philosophy". In the fields that are generally preferred by young people, such as "Economics", "Administration and Management", "Tourism", "Law", "Psychology", nearly one-third of all students study. Students in "Medicine" and "Pedagogy" are increasing, which are among the sectors classified as deficient by staff. Unlike medical professionals who work mainly in their field of study, about 40% of graduates work something else.

Several conclusions can be drawn. On the one hand, there is a discrepancy between preferences for young people's majors, the accumulation of many students mainly in humanities and social sciences who, after graduation, cannot find a job because of the fact that the labor market is saturated with such specialists. The other problem is that the university graduates do not approve the settlement or the institutions in which there are vacancies or do not approve the payment offered to them. At the same time, according to employers, young people do not have the necessary qualifications and skills.

The information provided clearly shows that there is a mismatch of the skills supplied under the graduates and the demand for skills as preferred business specialists on the other side. The discrepancy between demand and supply of work for higher education staff leads to the conclusion that greater alignment of the higher education delivered with the needs of employers is necessary.

4.1. The Regional Context of Life-long Learning and the Skills Systems

Two functional regions (FRs) are presented in this article: Blagoevgrad and Plovdiv. The Blagoevgrad functional region corresponds to the Blagoevgrad district. The Plovdiv functional region corresponds to the municipality of Plovdiv and its links in the business zone Trakia. The two functional regions were chosen in this way because of the established labour market and other functional flows within the corresponding territories and in order to have a comparable population size which is 341 625 inhabitants for Plovdiv and 312 831 for Blagoevgrad. The two functional regions differ in several ways: Plovdiv FR is located in Central Bulgaria, while Blagoevgrad FR is located in Southwestern Bulgaria, bordering Macedonia and Greece. Plovdiv FR is an urbanized environment characterized by developed industry and services, while in Blagoevgrad FR urbanized and rural areas with developed agriculture occur. The population in both regions is an active participant in the local and regional environment and is involved in the implementation of lifelong learning programs aimed at increasing employment, improving quality of life and developing living conditions.

The structural relationships and the link between attainment of qualifications, and the labor market sectors are implemented by various institutions that develop skills and interact with social actors who have the potential and resources to influence the process

of training young adults.

Different organizations have varying degrees of participation in skills formation. The main institutions focused on educational and training activities as well as the creation of professional culture are: South-West University "N. Rilski", regional colleges and vocational schools and high schools in Blagoevgrad region. In addition, there is a significant involvement of private organizations from non-formal learning, mainly involved in foreign language and computer education.

The process of creating skills for the labor market also includes a wider pool of organizations. These are: the Blagoevgrad Employment Agency and the Labor Office, which are actively involved in the formation of qualifications and skills. These structures are regional divisions of the Ministry of Labor and Social Policy and their activities are concentrated in a local context. They establish contacts with municipal authorities, with private businesses in the region, as well as with educational institutions, and implement various policies and projects that have national and European funding and target the population of different ages, with different qualifications and education. The activities of these structures are focused on attracting young people, improving their skills and qualifications, as well as developing knowledge among unemployed and unskilled people. The projects implemented are related to the activation of all stakeholders. The aim is to stimulate socially disadvantaged groups who have serious difficulties with their adaptation and social inclusion.

Another participant in the skills system is regional business, which is an essential component of all local structures. Regional business is a recruitment environment, it creates the conditions for the development of local infrastructure itself and is an active participant in the programs of the Labor Office. In addition, the regional business is also linked to the development of charity actions.

In terms of regional skills development, there can be a gap between training and labor market expectations. This is due to the underdevelopment of the economy and not particularly the long-term vision of the business regarding its development. In recent years, the development of regional business has been accompanied by small investments, reduced labor needs, closure of industries and entire sectors. In addition, training institutions carry out the educational process without following changes in the economic environment and train non-converting staff.

Regional Education Management (REM) is a structure that is also relevant to the system of skills formation in the Blagoevgrad district. Its functions are aimed at maintaining link and coordination between the Ministry of Education and secondary schools, as well as the municipal authorities in the region.

The mentioned structures of the system for skills formation are actively involved in the implementation of projects for the integration of young people, for the formation of qualifications and professional habits. The idea behind the various projects and programs is to create staff for regional businesses and organizations, to stimulate the overall development of the local environment and economy. The programs presented in this article show their different specifics, as well as various difficulties in their implementation (Milenkova and Apostolov, 2018).

4.1.1. Career Start program

The Career Start program is targeted at young people under 29 who have completed their higher education but have not started a job and have no professional experience. Applicants can submit their documents to the Regional Labor Offices. The program aims at hiring young people for a period of 9 months in central and regional public administration units and structures. The project is a long-term measure aimed at the continued stabilization of the labor market and economy in the country and regions.

The project Career Start in Blagoevgrad region is focused on preventing labor market dequalification among young adults, the hiring (after completing the program) a part of youth on permanent job positions, attainment of a qualifications, training and experience that meet the expectations of the labor market and market economy. The program has been introduced since 2003 and applies to all Labor Offices in the country. It is aimed at young adults who have no vocational experience after completing their higher education. The main objectives of the program are: to create employment for young people, as well as to acquire working habits and training, expanding the knowledge and skills created so far in formal and non-formal education. This program is highly appreciated and takes into account its effectiveness and sustainability, both by local office in the functional region

Blagoevgrad and in other employment structures in national and regional context. One of the main reasons is that many young adults who have been involved in the project remain employed in public administration structures.

Following the information given by Employment office directorate in Blagoevgrad in 2009 only 35 graduates were involved in the program in the district. After 2014 this figure increased to 84 in 2015, 99 in 2017 and 104 in 2018.

"The Career Start project provides young adults with the opportunity to acquire practical skills, to form work experience and training that are important to the profession, in order to be successful in their field, and to be employed on a full-time basis." (Expert, female).

A major requirement of this program is that young people are under 29 years of age at the time of application. In addition, they must have a university degree in higher education, apply for a position that requires higher education and have no professional experience in the field. This means that they have not been hired to such a position so far.

"This project helped me a lot. As I graduated, I started looking for a job and for a long time I traveled through different companies and organisations to look for a job. It turned out to be a tough thing. . . When I started looking for work in the summer of 2016, I faced serious problems. I was not from Blagoevgrad and when I finished my education I had to vacate the dormitory and then it became very difficult – I have no job, I do not have a home, I have no income. Well, my family – parents and relatives supported me mostly financially so I can handle it. And then a friend told me about this programme. This programme saved me" (Young adult, female).

The interviewed experts said that the young people who participated in the program gave a positive assessment of the project and were satisfied with their participation, as it is a useful professional choice and skill development.

„In my view, young people's involvement in this program is linked to the fact that they actually define it useful; but here I want to emphasize also that these programs are generally important in regional and national level, because when young people have jobs and good pay, they do not seek work abroad." (Expert, male).

There are many examples that can be cited in relation to the successful participation of young people in the project.

Overall, it can be said that the interviews conducted with young people who participated in the Career Start project, as well as with experts who are employees of the Labor Office and worked on the implementation of the project, express a positive attitude and assessment of the program. The opinions are clear and definite. In addition, the project is also positively evaluated at national level in terms of its sustainability. What creates some problems is the fact that not all participants in the program are employed on a permanent basis and this inevitably creates frustration for young adults. This means that after the end of the program, some young people participating in it are out of work again. Solving the problem requires state support through a variety of incentives, tax breaks, or covering part of the insurance contributions at the expense of the employer for a certain period. This will provide a bridge between the temporary and permanent employment of young people, which in the long run will result in clear and lasting results from the efforts made and the return on the investments which have been made.

Another problem related to the skills system for young people in the functional region of Blagoevgrad relates to the education system and in particular the availability of much theoretical knowledge in training. Students and observers, as well as various experts, share that the Bulgarian education in the formal learning system is very theoretical, the practical classes are insufficient and the productive relationships between the universities and the business are insufficiently developed.

The functional region of Plovdiv was defined on the basis the established functional relations between the main economic, cultural and policy institutions in the region. It consists of the municipality of Plovdiv and the surrounding industrial enterprises, forming the Trakia Economic zone. Plovdiv is the second largest city in Bulgaria situated in the South-Central region of the country. After the economic crisis of 2008, the economy of the region slowly recovered and at present the private and public businesses in the functional region attract daily commuters from an even wider territory. It is a major railroad junction and has a regional airport which together give the region many logistic advantages. The economy of the functional region has a significant share of industry with an output

over 7 billion EUR in 2017 and over a third of the employment in the region. The share of services in the regional economy is also growing with the IT sector attracting highly skilled labour force. Tourism is also gaining economic importance and has received a boost from the choice of the city to be the European Capital of Culture in 2019.

The basic structures included in the system of skill formation in the Plovdiv functional region are the local authorities, the Labor Office and the Municipality of Plovdiv. The Labour Office organizes different qualification courses for unemployed people. There are also private labour offices, which function it is to provide information about vacancies in the private sector. They interview the applicants and referred to the meeting with the employer at the appropriate persons The skills system in the region on the supply side includes 9 regional universities and colleges, 14 vocational schools and various private institutions for qualification and training. Vocational schools are defined as the main structures that prepare workers with qualifications in secondary education. There are different private structures for acquiring knowledge and skills in different profiles within the region. On the other side, young people, most often, are those who seek to enhance their knowledge and skills. They are enrolled in institutions of formal and non-formal education that are accredited in terms of the quality of the training provided. Local employers and municipal authorities are also included in the system of skills formation as active users of trained staff.

There are also many NGOs involved in the Skill Formation System. They vary in size and activity. The main activities of these NGOs are related to the implementation of various programs of social importance and funded from different sources. They hire mainly young adults, and offer them an opportunity to be particularly trained in various practical courses, or if they are still studying - to use and enhance their training in a real practical environment. NGOs work with various public entities, training units and other NGOs in the region. Some of the NGOs are focused on organizing a variety of trainings for the acquisition and learning of knowledge, upgrading skills and developing qualifications of young people, such as: soft skills, entrepreneurship skills, leadership skills, etc.

The skills formation institutions, as they are embedded in a broader network of social connections, influence local structures and create connectivity between local institutions, but sometimes they cause some difficulties due to their poorly timed activities and insufficient capacity. Educational institutions have an interest in enhancing contacts and relationships with public and private employers, but such efforts are not always fruitful. At the same time, business organizations do not turn to training structures to provide them with highly educated and qualified staff. Usually, they prefer to offer qualification courses by themselves. NGOs, being smaller in size, can be more mobile, responsive to the demand for educational services and concentrate their efforts on activities that are more appropriate and equivalent to the preferences of young people. At the same time, it is noticed that the teaching and educational structures themselves do not develop enough contacts, do not seek sustainable mutual benefit of cooperation in teaching, and in cases where there is some interaction, it often refers to activities outside the learning. This leads to the distance of the subjects who train and form skills.

The coordination of the whole system remains underdeveloped. The national policy focuses on strategies and directives, without offering specific tools for elaborating the national skill system. This limits the opportunities of the regional system to be more flexible and to respond quickly to rising market needs. Another problem is the lack of information that can circulate freely between all participants. Each project represents a constant movement between the different levels: national-regional-local. According to the project participants, due to the fact that there are several levels of hierarchy, information is interrupted at some of the levels and this creates some difficulties.

4.1.2. Youth Guarantee Program

The primary objective of the Youth Guarantee which is a European-wide program is to achieve early intervention in the situation of young people up to 29 years of age by including them in quality training, internships, apprenticeships or work, up to 4 months after becoming inactive or unemployed. The ambition is to fill the gap between the educational system and the labor market. The programs and measures under the Youth Guarantee are financed by the national budgets of the Member States, with additional ESF funding and the Youth Employment Initiative.

The Regional Employment Agency in Plovdiv is responsible for the implementation of the regional active labor market policy, including the programs and measures directed to young people. There are two schemes developed in the region under the Youth Guarantee: 'Youth Employment' and 'Youth Training and Employment'. Both schemes are targeting registered unemployed but the latter also has a strand that tries to reach over the young people not in education, employment and training. The local authorities considered that the program provided a comprehensive set of services: career guidance for young people; acquiring professional skills and habits or key competences; financing and maintaining temporary employment; stimulating employers to create new jobs; support to start up an own business and develop business ideas; provision of information and advice by the EURES network.

The interviewed practitioners working in the Regional Labor Office expected a positive effect of the program by increasing youth employment and hence reducing the number of those threatened to fall into poverty. They also pointed that the schemes bring about a reduction of the number of early school leavers, particularly among the Roma youth. These effects are a precondition for creating sustainable development and minimizing cases where young people are excluded from the economic and social system.

The project is associated with high expectations to contribute to the solution of other regional problems as well, most importantly to reduce the high emigration wave of predominantly young people from the region. As one of the experts said:

"Somehow this project is related to the demographic problem here, the aging of the population, respectively the "brain drain". Out employers suffer from the lack of qualified and youthful labor force." (Expert, male).

What experts consider that the program has not yet achieved is reach over to the least qualified and particularly to the Roma youth.

The importance of the Youth Guarantee and measures and practices in this regard stimulate the ambition of the participants to achieve their aims. It should be noted that improving the qualifications of young people, developing their skills is of great importance. Internships and trainings are a good way to achieve this and to use the labor force in the overall production process. It is important for young people to gain experience in their years of study. Labor market efficiency can be achieved in cases where there is a cross-match between the skills sought and the training and qualification levels offered. This means that the main structures involved in skills training and skills seeking have come to an agreement.

However, from the analysis of the interviews with young beneficiaries in the program, we found several other problems in the implementation of the Youth Guarantee. Some young adults in Plovdiv claimed that their decision was made under a pressure coming from their actual or potential employers. When young people applied for jobs that matched their training and experience, employers persuaded young applicants to apply and apply for a Youth Guarantee Program, rather than being hired and contracted. Thus, interviewed minority men say they have been enrolled in a Youth Guarantee Program at the initiative of their employers, who will save money on working and insurance benefits for Roma workers.

A consequence of the program, according to the interviewed young people, is that it does not always help them achieve the goals they have set out and aim for. Some of the young people who expected to be hired after completing the training had not received an offer and had to re-register with the employment office as unemployed or to start other training. According to young people, this is not favorable to themselves, nor does it have an effect on the business or the running program.

When the young interviewees tried to evaluate the program as a whole, they were positive about the concrete occupation skills that they acquired during their participation in the Youth Guarantee in the region. In addition, young adults understand that their inclusion in the Youth Guarantee Program brings many positive things personally. On the one hand, these are professional skills and qualifications, and on the other hand, many skills are formed, related to their ability to communicate and create connections, to plan different things in life, self-confidence, prestige, learning new things. Some even mentioned that the result was no less than knowledge "how to become a better person" (Young adult, male).

5. DISCUSSIONS

From results of the analysis presented in this article, it is clear that the integration of young people in the labor market continues to be a huge challenge in Bulgaria. Even some

of the young adults with prestigious education often find themselves unprepared for the job market. The most common problem in undergoing the school-to-work transition is the discrepancy between expectations and reality. Low pay for labor leads to demotivation. Another problem is the impossibility to find a job in the acquired specialty. Difficulties in the youth transitions in Bulgaria often lead young adults to leave the country in search of better working and living conditions (Kovacheva and Hristozova, 2019). The dynamic nature of modern labor markets raises the need for better programs to ease the early integration of young people. Their job inclusion is seen as a key prerequisite for the successful reduction of the share of people living at risk of poverty, material deprivation or a strong dependence on social assistance systems.

This article contributes to the discussions about young adults' transition from education to employment, using theoretical analysis and empirical results based on an international European Horizon 2020 study, which finds that labour market demand impacts the effectiveness of LLL policies (Parreira do Amaral and Kovacheva, 2019).

6. CONCLUSION

The idea of this article was to show that the success of youth transitions is linked to various programs that support the integration of young people into the labor market. The overall vision of the article was to emphasize the critical approach in tracking the transition from education to employment in Bulgarian contexts complemented by the institutional perspective of the skills system.

The policies that have been studied in the Blagoevgrad and Plovdiv regions have European funding and regulations and are promoted both on the national and the regional level. In general, the presented programs can be considered as good examples related to providing opportunities for higher qualification, formation of professional experience, creation work habits and soft skills, through internship programs in various business structures and organizations, strengthening the links between the employers' needs and the competences of young people. The reviewed initiatives are aimed at young people who are not only unemployed but also targeting active and inactive youth and socially excluded and vulnerable people who are experiencing serious difficulties in its implementation and life paths.

Looking more closely and using qualitative data from experts and young participants the picture shows various discrepancies. The practitioners implementing the schemes do not have the necessary specialized skills to deal with vulnerable groups and instead work with all age groups in need of training. On their part the young adults are excluded from the LLL policy making process and their voices on the implementation and its social effect are not heard. A significant challenge lies in the fact that, after completing the internship, the organization or the company in which the traineeship is carried out recruits few young trainees. In addition, the selection process for applicants for internships is not transparent, and decisions are made by the organization where the internship will take place and the openings are very limited so that not everyone who wishes can go through the wishes internship.

Regarding the mismatch between education and labor market needs, it can be summarized that the legal and macro political framework (e.g. laws and strategies) is focused on educational results; there is no explicit dialogue between structures and levels of education in a vertical and horizontal aspect, which means that there is not enough cohesion between them. All of this is an indicator that there are challenges to the practical side of lifelong learning policies and programs that must meet the needs of young adults. In addition, Bulgarian formal education is a closed system that functions independently from the non–formal education. On the other hand, programs, in their entirety, have results, achievements and strengths, which, while complemented by some weaknesses and shortcomings, manage to stimulate young people.

As a result, the answer to our research question is that the lifelong programs and initiatives developed on the regional level could fill in the gaps left from the deficiencies of the national skills system and to serve well the objective to support youth transitions from education to employment. More systematic schedule is needed, longer-term vision, more focused strategies on how to develop the skills of individuals. Bulgarian education is not always able to meet the new requirements and to take effective account of changes. In this sense, complicating the responsibilities, the work and the nature of the obligations becomes a prerequisite for the effective skill system.

ACKNOWLEDGEMENTS

The analysis is based on the results of the project "YOUNG_ADULLLT – 'Policies Supporting Young Adullts in their Life Course', team coordinator Prof. Marcelo Parreira do Amaral, Ph.D., under the Horizon 2020 Program, 2016-2019.

The authors gratefully acknowledge the support of the project "YOUNG_ADULLLT – 'Policies Supporting Young Adullts in their Life Course', funded by the European Union's Horizon 2020 research and innovation programme under Grant agreement № 693167 (2016 – 2019).

Conflict of interests

The authors declare no conflict of interest.

REFERENCES

Benneworth, P., & Jongbloed, B. W. (2010). Who matters to universities? A stakeholder perspective on humanities, arts and social sciences valorisation. *Higher Education, 59(5)*, 567-588. https://doi.org/10.1007/s10734-009-9265-2

Boyadjieva, P., & Ilieva-Trichkova, P. (2015). Institutional diversity and graduate employability: the Bulgarian case. In *Diversity and Excellence in Higher Education* (pp. 153-171). Brill Sense. https://brill.com/view/book/edcoll/9789463001724/BP000010.xml

Boyadjieva, P., & Ilieva-Trichkova, P. (2019). (Un) realized agency in a situation of early job insecurity: patterns of young people's agency regarding employment. In *Youth Unemployment and Job Insecurity in Europe*. Edward Elgar Publishing. https://doi.org/10.4337/9781788118897.00012

Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative sociology, 13(1),* 3-21. https://doi.org/10.1007/BF00988593

Delors, J., Mufti, I. A., Amagi, I., Carneiro, R., Chung, F., Geremek, B., Gorham, W., Kornhauser, A., Manley, M., Quero, M. P., Plique, M.-A. S., Singh, K., Stavenhagen, R., Suhr, M. W., and Nanzhao, Z. (1996). *Education: The Treasure Within,* Paris: UNESCO, https://unesdoc.unesco.org/ark:/48223/pf0000102734

European Centre for the Development of Vocational Training (Cedefop). (2010). *The skill matching challenge: Analysing skill mismatch and policy implications.* Office for Official Publications of the European Communities, Luxembourg. https://www.cedefop.europa.eu/files/3056_en.pdf

European Commission (EC) (2000). *A Memorandum for Lifelong Learning. European Communities*, Brussels: Directorate General Education and Culture, https://arhiv.acs.si/dokumenti/Memorandum_on_Lifelong_Learning.pdf

European Commission (EC) (2001). *Making a European Area of Lifelong Learning a Reality*. Communication from the Commission, Brussels: COM (2001) 678 final, https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2001:0678:FIN:EN:PDF

Eurofound (2014). *Mapping Youth Transitions in Europe.* Luxembourg: Publications Office of the European Union, https://www.eurofound.europa.eu/publications/report/2014/labour-market/mapping-youth-transitions-in-europe

Federation, M. E., Radovic, M., & Djuraskovic, J. (2015). Report: Mismatch between Education System and Labour Market Needs–Enabling Environment for Sustainable. Education, 7. http://poslodavci.org/en/publications/mismatch-between-education-and

Freeman, R. E. (1984). *Strategic Management*: A stakeholder approach. Boston: Pitman.

Klapka, M. P., Halás, D. R. M., & Tonev, M. P. (2013). Functional regions: Concept and types funkční regiony: koncept a typy. *XVI. mezinárodní kolokvium o regionálních vědách,* 94. https://doi.org/10.5817/CZ.MUNI.P210-6257-2013-11

Kogan, I., Noelke, C., & Gebel, M. (Eds.). (2011). *Making the transition: Education and labor market entry in Central and Eastern Europe.* Stanford University Press. https://doi.org/10.11126/stanford/9780804775908.001.0001

Kovacheva, S. (2001). Flexibilisation of youth transitions in Central and Eastern Europe. *Young, 9(1),* 41-60. https://doi.org/10.1177/110330880100900104

Kovacheva, S., & Hristozova, D. (2019). Youth migration and life course transitions: Comparing the impact of women's mobility across generations in Bulgaria. *Sociologija, 61(2),* 210-226. https://doi.org/10.2298/SOC1902210K

McLoughlin, C., & Luca, J. (2002). A learner–centred approach to developing team skills through web–based learning and assessment. *British Journal of Educational Technology, 33(5)*, 571-582. https://doi.org/10.1111/1467-8535.00292

Milenkova, V., & Kovacheva, S. (2020). *Regional Insights to Lifelong Learning Policies in Support of Young Adults in Bulgaria*. Sofia: Avangard Prima.

Milenkova, V., & Apostolov, G. (2018). Implementing Youth Targeted Education and LLL Policies at Regional Level. *Strategies for policy in science and education-strategii na obrazovatelnata i nauchnata politika, 26(2)*, 146-165. https://strategies.azbuki.bg/en/staregies/sonparticles2016-3/xxvi-2-2018/#art02

Mitev, P.E., B. Popivanov, S. Kovacheva and P. Simeonov (2019). *Bulgarian Youth. A Sociological Portrait* 2018/2019. Sofia: Friedrich Ebert Foundation, http://library.fes.de/pdf-files/id-moe/15263.pdf

Morgado, A., Sequeira, T. N., Santos, M., Ferreira-Lopes, A., & Reis, A. B. (2015). Measuring labour mismatch in Europe. Social *Indicators Research, 129(1),* 161-179. https://doi.org/10.1007/s11205-015-1097-0

Outlook, O. O. R. (2016). *Productive regions for inclusive societies*. https://www.oecd.org/regional/oecd-regional-outlook-2016-9789264260245-en.htm

Parreira do Amaral, M., & Kovacheva, S. (Eds.). (2019). *Lifelong Learning Policies for Young Adults in Europe: Navigating between Knowledge and Economy*. Policy Press.

Roberts, K. (2018). Explaining Education-to-Work Transitions: Thinking Backwards, Situating Agency and Comparing Countries. *Review of European Studies, 10(1)*, https://doi.org/72.10.5539/res.v10n1p72

Schomburg, H., & Teichler, U. (2007). *Higher education and graduate employment in Europe: results from graduates surveys from twelve countries* (Vol. 15). Springer Science & Business Media. https://doi.org/10.1007/978-1-4020-5154-8

Stoilova, R., & Nyagolov, L. (2016). *Socio-professional Differences of School-to-Work Transitions*. Sociological Problems, 48.

Tholen, G. (2015). What can research into graduate employability tell us about agency and structure?. *British Journal of Sociology of Education, 36(5)*, 766-784. https://doi.org/10.1080/01425692.2013.847782

Tomlinson, M. (2017). Introduction: Graduate employability in context: Charting a complex, contested and multi-faceted policy and research field. In *Graduate employability in context* (pp. 1-40). Palgrave Macmillan, London. https://doi.org/10.1057/978-1-137-57168-7_1

Tomanović, S. (2019). Reconstructing changes in agency in the young people's social biographies through longitudinal qualitative research. *Young, 27(4),* 355-372. https://doi.org/10.1177/1103308818793304

Walther, A. (2006). Regimes of youth transitions: Choice, flexibility and security in young people's experiences across different European contexts. *Young, 14(2),* 119-139. https://doi.org/10.1177/1103308806062737

Rezanovich, I., Rezanovich, A., Piatkova, M. & Peredrienko, T. (2020). The method of destructive scenario forecasting for the development of divergent thinking of managers, *International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE), 8(1)*, 61-67

THE METHOD OF DESTRUCTIVE SCENARIO FORECASTING FOR THE DEVELOPMENT OF DIVERGENT THINKING OF MANAGERS

Dr. Rezanovich Irina, South Ural State University (national research university), Chelyabinsk, Russian Federation, E-mail: rezanovichiv@susu.ru
Dr. Rezanovich Anatoly, South Ural State University (national research university), Chelyabinsk, Russian Federation, E-mail: rezanovichae@susu.ru
Dr. Piatkova Marina, South Ural State University (national research university), Chelyabinsk, Russian Federation, E-mail: piatkovamr@susu.ru
Dr. Peredrienko Tatiana, South Ural State University (national research university), Chelyabinsk, Russian Federation, E-mail: peredrienkoti@susu.ru

ARTICLE INFO

Original Research
Received: November, 14.2019.
Revised: February, 20.2020.
Accepted: March, 03.2020.
doi: 10.5937/IJCRSEE2001061R

UDK
005.32:159.955.075(470)

Keywords:
education,
manager,
divergent thinking,
scenario forecasting,
method of destructive scenario,
forecasting.

ABSTRACT

The phenomenon of thinking is well studied in psychology, and many of its types are revealed. However, little attention is paid to the development of divergent thinking in general and the development of divergent thinking of managers in particular. At the same time, multidirectional management decisions, their prompt adoption and the originality of content are very necessary for enterprises. The aim of the article is to give the characteristic of divergent thinking, to note its features and to present own definition of the concept "divergent thinking of managers". In the article the analysis of one of the functions of managers, that is forecasting, is described. The scenario method and a new method of destructive scenario forecasting are proposed. The algorithm of the last method application in the form of a technological map is shown. The result of using the method for 2 years on specialized programs of professional development and retraining of managers is described. The results of mathematical processing of the obtained data on diagnostic procedures are presented. They testify that in the experimental groups the development of qualitative characteristics of divergent thinking of managers proceeded more intensively than in the control ones, in which the method of destructive scenario forecasting was not used. That proves the effectiveness of the proposed method for the development of divergent thinking of managers.

1. INTRODUCTION

Currently, large-scale political and social transformation, continuous economic reforms and competition of businesses caused the emergence of a large number of non-standard management situations. The existing challenges have raised the complexity and number of management tasks, which significantly increased the responsibility of managers for the accuracy, timeliness and efficiency of decisions.

The enlargement in non-standard situations and the growth of new management tasks required constant updating of knowledge and skills of managers. Probably that is why seminars, round tables, master classes and, of course, more large-scale specialized MBA (Master of Business Administration) and Executive MBA programs have become so popular today.

These two programs appeared in America at the beginning of the twentieth century and have become very popular both throughout the world and in Russia. The MBA program provides for the knowledge and develops the skills of those who do not have an economic or managerial education, or the education was received long ago and it needs to be updated.

The Executive MBA program is

Corresponding Author
Dr. Peredrienko Tatiana, South Ural State University (national research university), Chelyabinsk, Russian Federation, E-mail: peredrienkoti@susu.ru

designed for business owners, managers and top managers of enterprises. Trainees, as a rule, have significant leadership experience. While studying they work out various aspects of the business in the system, improve their skills in making non-standard, but well-grounded managerial decisions, and acquire new connections and contacts.

A modern manager is required to analyze the current situation, to consider various solutions, to predict the possible results of his actions and after that make informed management decisions. In this case, not only the knowledge and skills of a manager should be updated, but also his thinking should be improved. It should become more flexible, dynamic, creative, and at the same time systematic, critical and rational. These thinking qualities can be developed at any age, as evidenced by the studies of Riegel, 1976; Ananiev, 2001, Dweck, 2006 and other scientists.

The new management tasks, the need to develop mental abilities led to the search of the pedagogical community of relevant trends, technologies, methods and means of professional development for managers. One of these trends is the development of divergent thinking of a manager, which determines the ability to find solutions to management problems.

2. MATERIALS AND METHODS

The phenomenon of thinking is actively studied by psychologists and it is evidenced by a large number of scientific theories. In the following researches this phenomenon is considered from different perspectives: thinking as behavior (Wertsch, 1998 and other); thinking as an information processing system (Lindsay et al., 2001; Neisser, 2004 and other); thinking as a motivational process (Maslow, 1967 and other); thinking as an intellectual function (Brushlinsky and Tikhomirov, 2013 and others); thinking as a structural rearrangement of operations (Wertheimer, 1945); thinking as an association of representations (Mill, 2020 and others) etc.

The studies of most psychologists prove that thinking appears in a problem situation, the solution of which occurs due to the transformation of certain open relationships. In the course of this transformation such operations as: analysis, synthesis, abstraction, generalization are used. Some previously hidden relationships are revealed, which lead to the solution of problems.

There is no consensus on the types of thinking among scientists. Therefore, various classifications are offered: visual-effective, visual-figurative, abstract-logical and verballogical; theoretical and practical; discursive and intuitive; productive and reproductive, etc. In psychology, there are studies of some specific types of thinking: engineering thinking (Lucas and Hanson, 2016); visual thinking (Arnheim, 2001); dialectical thinking (Riegel, 1976; Veraksa, 2019); fixed thinking and growth thinking (Dweck, 2006); creative thinking (Lindsay et al., 2001; Katrenko et al., 2018); critical thinking (Bailey et al., 2019). The above list of types of thinking is not complete. There are convergent and divergent types which are less presented in the scientific literature.

Convergent thinking is a linear, invariant thinking, which is characterized by clear direct links between phenomena and algorithmized thought. Such thinking complicates the adequacy of the perception of events, reduces the efficiency of work with the team and prevents the understanding of situational problems.

Divergent thinking is a multidirectional search for multiple answers to one question. Such thinking is characterized by the absence of rigid links and dependencies between phenomena. The concept of "divergence" is borrowed from the natural sciences, its authors are considered to be Darwin, Ch. (1998) and Wallace, A. (2013). Both scientists explained by this concept the diversity of biological species of animals and plants.

The definition of divergent thinking was given by Guilford, J. (1967) to characterize multidirectional thinking, in other words, thinking that deviates from the stereotype. The scientist called the main qualities of divergent thinking: fluency, flexibility, originality and accuracy. In this context, the quality of thinking meant the following:

- fluency – the ability to express the maximum number of ideas in a certain time interval;
- flexibility – the ability to generate new non-standard ideas;
- originality – the ability to put forward non-obvious ideas, which can not coincide with the generally accepted ideas;
- accuracy – the ability to give a complete view of their thoughts and reasoning.

The study of divergent thinking was continued by Piaget, J. (1977). He considers it as a form of independent thinking and

independent actions determined by education and personal life experience.

Many scientists revealed the peculiarities of divergent thinking and factors of its development. So the following specific features of this type of thinking were formulated: inner freedom, a manifestation of the ability to the evaluation, comparison, analysis, hypothesis-building; perception of fluency and flexibility (Guildford, 1967, Piaget, 1977); the leading role in the creative process (Acar and Runco, 2015); versatility (Matyushkina, 2018); research activity (Schneder, 2007); the interaction of different forms of thinking in solving creative problems (Lee and Therriault, 2013); the presence of a creative mental field (Dorfman, 2015).

Based on the existing ideas of scientists about divergence and divergent thinking, we propose to consider divergent thinking of managers as a special kind of thinking that allows to generate quickly various management decisions in non-standard situations, taking into account a variety of external and internal factors affecting the event. At the same time, we believe that each management decision should be characterized by a certain independence which can be private and even isolated. In this case, divergent ideas can be presented in the form of a "cognitive market", with inherent diversity and choice. To say more, these multi-vector possibilities, creating uncertainty and variability, ensure that managers take extraordinary management decisions.

2.1. Method of destructive scenario forecasting

Many modern economists are convinced that in the conditions of the market managers have to regulate economic activity of an enterprise and, respectively, to be capable to foresee and predict consequences of the made decisions. Forecasting is a kind of prediction how a situation in the future time is constructed. Forecasting concerns probable or desired events, phenomena, aspects, states and problems of the future. The main purpose of forecasting is to determine the connection of events, phenomena or factors affecting the development and change of the system or processes.

There are various methods of forecasting, which are quite successfully used in management. One of them is a scenario, which is used to study the possible trends and the likely consequences of certain management decisions in order to choose the best option. The scenario is a hypothetical picture of the development of certain events in time and space. Therefore, the use of a forecast scenario in management allows a manager to anticipate the consequences of the choice of a management decision and to generate the content and objectives of decisions in order to reduce or eliminate critical situations.

When using the scenario forecasting method, three scenarios are often drawn up: optimistic, pessimistic and realistic. The effectiveness of this method of forecasting proved James, M. and Koller, T. (2000) using it to evaluate 11 Brazilian companies. They noted that the scenario forecasting gives the closest result to the real market situation. Usually three main types of the final scenario are distinguished: scenario-essay, analytical and formalized scenario and each of them is developed for positive tasks. For example, when new products enter the market a scenario is developed to answer the questions: What demand can be for new products? How does advertising affect consumers? How will competitors react? etc.

This approach is traditional and, therefore, the development of scenarios is also carried out traditionally according to the past experience. But it's not always correct. In addition, managers who participate in the development of scenarios often perceive them as routine work and do not seek to be creative. This fact we observed annually, conducting classes on various programs of professional development and retraining of managers. At the same time, students are actively using scenario forecasting, many even call it a "favorite method".

This situation caused the modernization of the project-based learning. And we decided to take into account the fact that creating something is always difficult but destroying is always easy and even funny. So we reformulated the tasks transforming creative to destructive ones. Some examples of such transformations are presented in the Table 1.

Table 1. Examples of task transformation from creative to destructive

Creative tasks	Destructive tasks
What should be done to increase sales by 5% in a company?	What should be done not to increase sales in a company?
What should be done to increase the competitiveness of a company?	What should be done to reduce the competitiveness of the company or to destroy it?
How can the product quality be improved?	How can the product quality be reduced?
What should be done to increase productivity?	What should be done to reduce productivity?
What can be done to improve the efficiency of management in the company?	What can be done to reduce the effectiveness of management in the company?
What should be done to increase the return on assets?	What should be done to reduce the return on assets?
How can we speed up the launch of a new product?	How can we slow down the launch of a new product?
What should be done to increase staff motivation?	What should be done to reduce staff motivation?

In this case, we partially use the method of preventive forecasting as an attempt to predict the possible actions of something or someone on the basis of the available incomplete data. But let us emphasize that we use destructive tasks or, as we sometimes call "crash tasks". Having received a destructive scenario, it is not difficult for managers to implement the reverse, in other words, all the ideas are put forward to replace the opposite. This task also is taken very enthusiastically, and managers are very surprised by the result, which makes them happy.

The method of destructive scenario forecasting can be presented as the algorithm.

1) Managers are offered a situation (or they offer it themselves). This can be a specially designed case or a real situation that occurs at one of the enterprises. The information is taken from the public records, or one of the listeners became a participant and is able to provide an objective description of the events;

2) Mini-groups are created, the formation principle of which is not important (co-workers, in sympathy with each other, in the location in the classroom, etc.). They are working on one task. For a change, you can offer groups be divided: by the level of management (initial, average, high); by institutions of influence (competitors, public organization, partners, government agencies, etc.); by possible structural units of an enterprise.

3) Groups are given a goal formulated in a destructive, negative context;

4) Firstly the ideas are generated without discussion. There should be 10 – 15 ideas. Then these ideas are discussed, classified on various grounds. For example they can be grouped according to effect achievement: economic, social, psychological. The most promising proposals are selected based on the goal;

5) Next, there is the second discussion, as a result of which some ideas are removed from the list. That is the ones "which can be abandoned". Thus, the most interesting and effective offers remain;

6) The received list of proposals destroying an enterprise is considered from the position of opposition. That is how to reduce or eliminate these threats.

7) The groups get a list of solutions that are fully consistent with the positive, creative ideas of improving the functioning or development of an enterprise.

It might seem that this method is more time-consuming than the simple scenario method. However, our application of it shows that the time difference is very small. But the quality of the ideas received with the help of the described method is much higher.

3. RESULTS

To confirm our assumption about the effectiveness of the method of destructive scenario forecasting, we conducted the research work. One hundred fifty-two managers studied at various programs at South-Ural State University in 2017-2019 took part in the experiment. Seventy-seven managers were in three experimental groups, and 75 managers in three control groups. The number of people in the groups is sufficient, as it can ensure the reliability of the results at the level of statistical significance $\alpha = 0{,}95$.

The method developed by us was used in the experimental groups, the traditional scenario forecasting method was used in the control groups. We carried out the comparison according to several parameters: the number of ideas and their originality, dynamics of work, activity of students and their satisfaction. The method of observation, timing, performance analysis and questionnaires were used for

assessment. According to the results the number of ideas and the dynamics of their generation increased, also the activity of participants improved. There were almost no cases of students' evasion from the work and their satisfaction with classes was noted.

Therefore, the proposed method of destructive scenario forecasting is quite effective. But our aim was to check how this method affects the development of divergent thinking of managers. The analysis of the criteria for assessing divergent thinking of Torrance, E. (1993) and Guildford, J. (1967) allowed us to make our own list of criteria: originality, flexibility, innovation (development of the idea), dynamism, performance (accuracy). According to these criteria, we assessed divergent thinking of managers in experimental and control groups.

The use of the test of Torrance, E. (1993) for the study of the thinking, we are interested in, was not very informative, since almost all managers had high values. So we used the method of Guildford, J. (1967) of assessing the divergent thinking as well as the method of observers' assessment. To determine the statistical distinctiveness of the results, we used the chi-square test. In Table 2 the criteria of divergent thinking values before the experiment and after it are given.

Table 2. Distinctiveness between groups before and after the experiment

The criteria of divergent thinking	**Chi-square test statistic values**	
	before	after
originality	0,27	**21,54**
flexibility	0,03	**10,27**
innovation	2,13	**24,24**
dynamism	0,28	**16,06**
performance	1,01	**19,56**

Note: Un-bolded style indicates the absence of statistically significant differences between groups (observed value is less than the critical significance level of 0.05), and bold style indicates the presence of statistically significant differences (observed value is greater than the critical value at a significance level of 0.05).

The changes in the development of divergent thinking characteristics as a result of experimental work are marked with the help of the G-criterion of signs, which is used when comparing the measurement data obtained under different conditions on one sample of respondents. G-criterion allows to determine the direction of changes and the degree of their increase. Let's agree that "zero shift" is the absence of changes, "atypical shift" is the increase of 1 point, "typical shift" is the increase of 2 or more points. Eliminating from consideration "zero" shifts, we construct the Table 3.

Table 3. Types of shifts

Types of shift	The characteristics of divergent thinking				
	Originality	Flexibility	Innovation	Dynamism	Performance
Control group					
Typical	2	1	0	4	1
Atypical	14	14	11	22	12
Zero shifts	59	60	64	49	62
Gcr, p = 0.05	4	3	2	8	3
Gamp	14	14	11	22	12
Shifts at the significant level of 0.05	unreliable				
The experimental group					
Typical	27	26	22	20	13
Atypical	12	11	9	12	15
Zero shifts	38	40	46	35	49
Gcr, p = 0.05	13	13	10	10	8
Gamp	12	11	9	12	15
Shifts at the significant level of 0.05	reliable			unreliable	

4. DISCUSSIONS

As can be seen from the above data, the natural development of divergent thinking components in the control groups was insignificant, and according to the criterion of G signs at the significance level of 0.05, the shifts are not reliable. In the experimental groups, the three characteristics of divergent thinking shifts are reliable, and in the two remaining groups their number is greater than in the control ones.

Since the educational programs in the experimental and control groups were identical, all the tasks on the content were the same, the classes were conducted by the same teachers, we are convinced that the results obtained are due to the systematic and purposeful application of the method of destructive scenario forecasting in the experimental groups. Consequently, the proposed method can be recognized as effective and recommended for wide practical application for the development of divergent thinking in the system of business education.

5. CONCLUSIONS

1. The performed analysis made it possible to fix that divergent thinking is one of the types of human thinking. It is based on the phenomenon of divergence, which is understood as a discrepancy between the sides of the whole. In accordance with this divergent thinking of a manager is defined as a special kind of thinking that allows to generate quickly various management decisions in non-standard situations, taking into account a variety of external and internal factors that affect the event.

2. In determining the characteristics of divergent thinking of a manager the works of E. Torrence and J. Guilford, were used which allowed to highlight its distinctive features: originality, flexibility, innovation (development of ideas), dynamism, performance (Torrance, 1993; Guildford, 1967).

3. The carried out theoretical analysis and practical work confirmed the effectiveness of the method of destructive scenario forecasting for the development of divergent thinking of managers in the system of business education.

4. The method of destructive forecasting developed by the authors is validated. The technological map of its application reflects the gradual development of divergent thinking of managers.

5. The selected diagnostic methods made it possible to record the past changes in the development of divergent thinking of managers in all experimental groups.

6. The conducted research does not exhaust all aspects of the identified problem. Further work can be continued in such areas as: the search for new methods of development of divergent thinking; the improvement of the technology of scenario forecasting in group and individual work of managers; the development of methodological support for the application of the method of destructive scenario forecasting for the development of divergent thinking among the specialists in various spheres.

ACKNOWLEDGEMENTS

The authors express their gratitude to South Ural State University (national research university), all participants of the research and the editorial team of the International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE) for making this research possible.

Conflict of interests

The authors declare no conflict of interest.

REFERENCES

Acar, S. & Runco, M. A. (2015). Thinking in multiple directions: Hyperspace categories in divergent thinking. *Psychology of Aesthetics, Creativity and the Arts, 9(1),* 41–53. https://doi.org/10.1037/a0038501

Ananiev, B. G. (2001). *On the problems of modern human science*. St. Petersburg: Peter.

Arnheim, R. (2001). What it means to be creative. *British Journal of Aesthetics, 41(1)*, 24–25. https://doi.org/10.1093/bjaesthetics/41.1.24

Bailey, K. G. D., Rembold, L. & Abreu, Ch. M. (2019). Critical thinking dispositions and skills in the undergraduate research methods classroom. *Scholarship of Teaching and Learning in Psychology*, https://doi.org/10.1037/stl0000158

Brushlinsky, A.V. & Tikhomirov, O.K. (2013). On the development trends of modern psychology of thinking. *National Psychological Journal, 2(10)*, 10–16. https://doi.org/10.11621npj.2013.0201

Darwin, Ch. (1998). *On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life?* Hertsfordshire: Wordsworth Editions Limited.

Dorfman, L. Ya. (2015). Creative mental field, divergence and variability. *Psychological Journal, 36(6)*, 5–11.

Dweck, C. (2006). *Mindset: the new psychology of success.* New York: Random House Publishing Group.

Guilford, J. (1967). *The nature of human intelligence.* New York: McGraw-Hill.

James, M. & Koller, T. (2000). *Emerging markets: features of company valuation*. TheMcKinseyQuarterly. № 4, 7–11.

Katrenko, M. V., Nebytova, L. A. & Sasin, A. A. (2018). Creative thinking of students. Divergence. *Bulletin of modern research. 11.7(26),* 117–119.

Lee, C. S. & Therriault, D. J. (2013). The cognitive underpinnings of creative thought: A latent variable analysis exploring the roles of intelligence and working memory in three creative thinking processes. *Intelligence, 41(5),* 306–320. https://doi.org/10.1016/j.intell.2013.04.008

Lindsay, G., Hull, K. S. & Thomson, R. F. (2001) *Creative and Critical Thinking.* St. Petersburg: Peter. http://www.psychology-online.net/articles/doc-73.html

Lucas, B. & Hanson, J. (2016) Thinking Like an Engineer: Using Engineering Habits of Mind and Signature Pedagogies to Redesign Engineering. *IJEP, 6(2),* 4–13. https://doi.org/10.3991/ijep.v6i2.5366

Maslow, A. H. (1967). A theory of metamotivation: the biological rooting of the value-life. *Journal of Humanistic Psychology, 7(2),* 93–127. https://doi.org/10.1177/002216786700700201

Matyushkina, A. A. (2018) Understanding the Problem Situation and its Successful Solution. Izvestia Saratov University. Educational Acmeology. *Developmental Psychology, 7(25),* 62–67. https://doi.org/10.18500/2304-9790-20187-1-62-67

Mill, J. St. (2020). *The syllogistic and inductive logic system: statement of principles of evidence in connection with research methods*. Moscow: Lenand.

Neisser, U. (2004). The development of memory: new questions and old. *Developmental Review, 24(1),* 154–158. https://doi.org/10.1016/j.dr.2003.09.002.

Piaget, J. (1977). *The development of thought: Equilibration of cognitive structures.* New York: Viking press. https://doi.org/10.2307/1175382

Riegel, K. F. (1976). The dialectics of human development. *American Psychologist, 31(10)*, 689–700. https://doi.org/10.1037/0003-066X.31.10.689

Schneider, A. B. (2007). *Experimental psychology.* Moscow: Akademicheskiy proekt.

Torrance, E. P. (1993). Understanding Creativity: Where to Start? *Psychological Inquiry, 4(3),* 232–234. https://doi.org/10.1207/s15327965pli0403_17

Veraksa, N. E. (2019). Dialectical thinking: logic and psychology. *Cultural-historical psychology, 15(3),* 4–12. https://doi.org/10.17759/chp.2019150301

Wallace, A. R. *Contributions to the Theory of Natural Selection* (2013). Oxford: Oxford University Press. https://doi.org/10.5962/bhl.title.1254

Wertheimer, M. (1945). *Productive Thinking.* New York: Harper and Brothers, https://doi.org/10.1177/000271624725000171

Wertsch, J. V. (1998). *Mind as Action*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195117530.001.0001

DIDACTIC SKILLS IN THE FIELD OF DEVELOPING CREATIVITY AND INNOVATIVENESS OF A STUDENT

Dr. Anna Kožuh, University of Primorska, Slovenia; AFM Krakow, Poland
E-mail: ania@kozuh.net

ARTICLE INFO

Review Article
Received: January, 28.2020.
Revised: February, 05.2020.
Accepted: February, 10.2020.
doi: 10.5937/IJCRSEE2001069K

UDK
37.091.3

Keywords:
creativity and innovativeness,
creative attitude,
teacher's didactic workshop,
didactic initiatives and challenges,
creative teachers.

ABSTRACT

The authoress of this article highlights the areas of mutual connections and dependencies between theory and practice of students' creative development, making at the same time an attempt to show creativity against the background of didactic competence of a teacher. She describes the discussed creativity in the teachers' attitude primarily as an incessant search for better didactic solutions, discovering new learning opportunities and challenging the hitherto accepted assumptions of working with students. She points out that the leading trait of the teacher's creativity is also the ability to look for different ways of solving the same problem. In this article creative educational initiatives are analysed as well, they are perceived as a chance of creating more effective methods for a teacher to work with his or her students and facilitate their development and growth on many creative levels.

1. INTRODUCTION

Attempts to put innovative and creative tasks before students appeared many times in the long history of didactics. However, recent decades have been exceptionally strong and dynamic in this type of activity. More and more often teachers create and implement their didactic projects not only on the basis of knowledge gained during their studies or teacher refresher courses, but under the influence of various creative inspirations from the world of movies, books or art. Teachers for whom the challenges posed by creative education are the key issues should make every effort to make sure that tasks requiring non-standard student activities become everyday life in their schools. All educational projects, in accordance with modern education standards, should, as a rule, pose problems to the student that require analytical research and unconventional solutions.

Corresponding Author
Dr. Anna Kožuh, University of Primorska, Slovenia; AFM Krakow, Poland
E-mail: ania@kozuh.net

The creative attitude of the teacher is characterised above all by the ability to compare issues that are different from one another, the aptitude to perceive what is imperceptible for others and to approach a problem from different points of view. It is also the ability to look for many different ways to solve the same problem. According to this definition, creativity depends, among other things, on challenging the assumptions, discovering new opportunities and searching for better solutions. Therefore, creative teachers frequently use their imagination and are future oriented. They take risks more often than their less creative colleagues and are able to adapt to changes taking place in their environment. Creative teachers also quickly perceive relations among elements, which at first glance seem to be unrelated. There are also important emotional components present in the attitude of a creative teacher, such as empathy, interpersonal communication, active listening skills, openness to the unknown, courage in taking decisions and a sense of humour. Teacher's ingenuity, his or her imagination and ability to go beyond the accepted schemes and the courage to disprove and break the stereotypes of thinking. The teacher's educational creativity also includes non-stereotypical actions and following a route which has not been discovered earlier. It is the teacher and the type of class activities

proposed by him that influence the student's comprehensive development and allow them to fully accomplish the objectives of modern education. After all, one must not forget that education, filled with unusual initiatives and organised as a creative didactic process guarantees students, as graduates of individual types of school, a successful life and a sense of accomplishment.

2. THEORETICAL CONCEPTS AND UNDERTAKEN CREATIVE ACTIVITIES

Examples of non-standard and creative activities involving participation of students are popularized not only in various media but, above all, in educational theory and practice. Many pedagogical research studies discuss the problem of innovative activities in which schemes and stereotypes are abandoned. This problem has been discussed many times in the literature on instruction and education over the last decades. It concerned both creative pupils and creative teachers, accepting different terms interchangeably (Kožuh 2017, Łukasiewicz 2007, Nęcka 1998, Olearczyk 2010, Popek 2001, Renzulli, Reis and Thompson 2009, Smak 2014). Almost all the mentioned authors agree that working with a student, improving his creative competency, is a responsible and very difficult action. One of the reasons for these difficulties is the fact that these competencies often go beyond the knowledge and skills acquired in the standard teacher training process. Perhaps this is why teachers, who are graduates of philosophy, sociology, medicine, art and other fields of study are doing well with untypical tasks addressed to students (e.g. the educational activity of people like Edward de Bono, Tony Buzan, Maria Montessori).

The idea of education, the aim of which is to develop students' ability to solve problems, make decisions, cooperate, as well as communicate and express themselves in many ways, assumes many other school concepts, including the Reggio pedagogy, based on the philosophy of Loris Malaguzzi. This is a school that offers inspiration for learning, not the classical teaching, based on memorizing messages without understanding them and the ability to put them into practice. This concept, which is an innovative approach to early education, proposes simple but interesting and provocative didactic materials, as a source of motivation and patience in searching for unusual answers by the student (Edwards and Gandini 2011). Apart from pedagogues, the teachers in such a school are artists representing various fields of art, including graduates of photography, computer graphics, interior architects and designers, painters, musicians and sculptors.

3. DIRECTIONS FOR MODIFICATION OF TEACHERS' DIDACTIC PREPARATION TO UNDERTAKE CREATIVE CHALLENGES

The increasing need for constant invention of creative tasks should, therefore, be an opportunity for reflection for theoreticians of pedagogy and for authors of academic syllabuses training future teachers. Perhaps it is worthwhile to further modify the system of education at university by setting students - future teachers - more and more tasks that require non-stereotypical solutions. Perhaps it is also necessary to intensify classes at the academic level in such a way that projects addressed to students of teacher training courses encourage unconventional approach in searching for creative solutions and answers.

The literature of the subject strongly emphasizes that the most developing are workshops that enable discovering the secrets of the world in completely new ways (Adamek and Bałachowicz 2014). From this perspective, it is worth looking at the need for a complete professional preparation of the teacher and the process of his or her continuous development. This is how the popular slogan "creative development of the teacher" was conceived, of which Żechowska writes: "it can be understood as a theoretical vision, opportunity, chance and as a real process among real teachers" (Żechowska 1996, p. 54).

4. EXPECTED DIDACTIC SKILLS IN TERMS OF CREATIVITY AND NEW CHALLENGES FOR THE TEACHER

These considerations concern the position of creativity in the perspective of didactic competency of the contemporary

teacher, since the assumption of a modern educational process is the frequent use of seeking didactic methods and implementation of heuristic strategies. These methods are very popular in didactics as they initiate students' divergent thinking, enable them to discern and solve problems and analyse them from different points of view. Teacher's creative attitude is necessary and indispensable for proper planning and implementation of classes based on such methods. In the didactic space, the teacher plays the role of "the locomotive of pedagogical progress", without which setting off railway carriages on the long, independent journey to earlier unknown stations is impossible. This teacher is undoubtedly a moderator of the creative method of students' work and their guide to effective, creative problem-solving strategies. Constant reflection on one's own actions and evaluation of students' activeness as well as the ability to predict the consequences of certain definite behaviours that are undoubtedly the skills which foster the development of teachers' creativity.

Currently, the problem of the place of creativity among the didactic competency of the teacher has acquired new significance, and the creative attitude of the teacher has become an essential element of each educational initiative, since cultural and social transformations force a more innovative course of the process of teaching, as well as a faster and more complete development of creative abilities of both, the teacher and the student. This is a new challenge for school and teachers working there. The need to equip teachers with the ability to take up creative actions in the process of education and to expect creative attitudes from their students results from the conviction that learning to be creative cannot be accomplished otherwise than by participating in creative activities. In order for a student to be able to solve problems creatively, the theory and the knowledge of the principles of creative activity are not enough. From this perspective, one should also consider the necessity to modify the content of the concepts of teacher training and the process of its continuous development.

5. CONCEPTUAL ASSUMPTIONS FOR THE DEVELOPMENT OF TEACHERS' AND STUDENTS' CREATIVITY IN POLAND

The system of education in Poland and in other European countries has undergone numerous transformations in recent years. All this happened, inter alia, due to adoption of common directives for the "Old Continent" concerning the modification of education at all levels of education. Many of those documents caused reconstruction of educational syllabuses or their modernisation. These changes also apply to reorganisation and improvement of syllabuses and training of the teaching staff. Among the postulated competencies and characteristics of the teachers, their teaching skills, particularly their competency in the field of recognising the surrounding reality, planning their own activities and designing activities of the students, are clearly emphasized (Klus-Stańska 2010). All the skills mentioned above fit into the definition of creativity as an element of the teacher's didactic workshop. In the literature concerning teaching and education over the last few decades, the problem of creativity in didactic initiatives has been discussed repeatedly. Almost every time it adopted different concepts, various definitional attempts and different perspectives. Among them, one can find such concepts as: lessons of creative thinking, didactics of creativity, education with imagination, school of creativity, education for creativity, future oriented education, upbringing, education for freedom, as well as education for and through art. Among the authors, who addressed this issue, one should mention such names as: Dobrołowicz, Giza, Limont, Moroz, Nęcka, Renzulli, Szmidt and Żechowska (Dobrołowicz 1995, Giza 2006, Limont 2005, Moroz 1996, Nęcka 2001, Renzulli 1976, Szmidt 2013 and Żechowska 1996).

However, there is a concern that the process of education which offers the students mostly expository methods may turn out to be too complicated and insufficient for them. In the case of excess of expository methods, the contents of learning may be difficult to understand for the students, and hence difficult to memorize and to make use of in solving typical problem situations. Popek associates the creative attitude with such traits as: independent observation, creative

imagination, divergent thinking, intellectual flexibility, cognitive activity, high intellectual efficiency and construction skills (Popek 2001). Whereas in the characterological sphere, Popek describes the creative attitude as non-conformism, which he defines as independence, activeness, expression, tolerance and high self-esteem. It should also be emphasized that according to the author of this concept, a true creator appreciates not only his own ideas, but ideas of other people as well. According to the author of the concept, a desirable skill of a creative person is also encouraging others to generate creative, full of original solutions, ideas. All the ideas proposed by Popek are at the same time very recognisable features of a creative teacher.

Among the key factors conditioning the creative process and formation of the creative personality of the student, there are often the sense of freedom, diligence as well as tasks and issues posing challenges mentioned. This list was supplemented by Dobrołowicz with the element of cooperation and mutual understanding of intentions. The author writes, among other things, that "the times of individual explorers and inventors are over (…) success is the result of cooperation, which can also be triggered by the so called synergetic effect" (Dobrołowicz 1995, p. 155).

It should be clearly emphasized, however, that the theories of a teacher's creativity point out the fact that the level of creative performance of the profession can and must be continually improved. There is also a very important recommendation included in those assumptions, which emphasizes that not everything in this respect is the responsibility of the teacher, and the teacher is not the only person to be blamed for the style of his work. In her successive studies quoted hereunder, Żechowska arrives at the same conclusions, when she writes: "the teacher's creativity originates not only from the "internal" conditions (of the teacher's personality), but also from "external" conditions, i.e. from "external" situational pressures which are generated in the course of implementation of new and more complicated tasks set before the teacher (Żechowska 1996, p.59). In the opinion of Żechowska, a significant part in creative development of teachers is played by two variants of their potential abilities. The first one is the interpretative competency, articulating their ability to see the world and perceive other people and themselves in unceasing transformations. It is also the awareness of the dynamics of the world, which provokes asking questions and looking for new non-schematic and creative answers. The other variation of creative abilities necessary in the didactic work of a teacher are the self-creation competencies, defined as the abilities of a teacher to deliberate and originating from his or her own need for self-development, in compliance with their individual system of values. These competencies, in the context of the discussed concept stimulate innovative activities, which are a manifestation of the creative attitude of the teacher (Żechowska 1996).The concept of Żechowska is quite close to the model of Kwaśnica, who divides professional development of a teacher in the area of creativity into a number of phases (Kwaśnica 2007). In his reflections, the author particularly emphasizes the phase of creative transgression of the professional role, which is manifested in the teacher's critical attitude to the professional convention and in the teacher's quest to liberate himself or herself from this convention. This process is closely connected with the teacher's awareness of his or her professional commitment to a student, and to themselves as well. It is, therefore, the maturation of the teacher in the context of the sense of their own autonomy in their profession. Teachers who continually develop their professional workshop, finally reach such a level of criticism that it allows them to understand themselves and find their own methods to solve didactic problems.

Among the theories of creativity in Poland, attention should certainly be drawn to the concept of the creative process by Nęcka (Nęcka 2001). The author perceives the creative process as an interaction between the target and the test structures. The author understands the target as something that an individual desires in order to achieve something new and valuable, and defines the test structures as something of transitory nature that an individual creates in response to requirements of the target. Nęcka considers the creative process as a phenomenon subject to the principle of self-organization at the levels of strategic control selection and stage control, as well as at the level of performance. This distinction serves to "isolate the essential heuristic strategies involved in the creative process and intellectual operations that execute commands coming from a higher level of self-organisation" (Nęcka 2001). Among the heuristic strategies, which are to serve as decision-making and control functions in the creative process, Nęcka distinguishes, among other things, the strategy of vigilance, i.e.

sensitization to the reception of only certain classes of stimuli. In addition to the heuristic strategies mentioned above, intellectual operations, which directly affect creative interaction, are very important elements of the Nęcka's model. As for creative cognitive operations, the author includes the following elements: deductive reasoning, inductive reasoning, metaphorical thinking, making associations, abstracting and transforming. These operations occur also in other forms of cognitive activity, however, in creativity we have to deal with their special course, so that the resulting work exhibits unusual and unparalleled properties. At the same time, these operations are typical lesson strategies, regardless of the fact whether the seeking or expository methods become dominant. Regardless of the choice of the basic didactic methods in classes with students, deductive reasoning, inductive reasoning, metaphorical thinking as well as making associations are the leading components of the educational workshop of each teacher. Another important element of the Nęcka's model is the supply of creative processes, that is the inflow of information and power supply, i.e. the appropriate motivation (Nęcka, Orzechowski, Słabosz and Szymura 2005). An equally important element of the discussed model is critical thinking, which makes it possible to make decisions and seek answers to the question whether a given idea meets the requirements of the objective, whether it is advisable to continue the interaction and refrain from breaking off the creative process. The last element of the discussed concept is a typical component of almost any problem method applied in the process of teaching at all its levels.

Deliberations on the problem of creativity in education were taken up also by Moroz (Moroz 1996). Analysing adaptive situation of a young teacher, the author believes that each new lesson, every new topic and objective of a lesson compels the teacher to modify his or her behaviours and to change the previously chosen lines of action. According to Moroz, in this way the teacher becomes the subject of the didactic process. In the author's opinion, when teachers are functioning at the creative level, they cannot be expected to conduct their lessons according to the pattern that they have learnt. Moroz believes that this stage applies to the teachers with pedagogical experience and effective creative work in the form of numerous modifications of educational procedures.

The problem of the area of teaching activities, aimed at developing creative attitudes of students was also taken up by Teśluk (Teśluk 1999). The authoress draws attention to these aspirations, writing "opinions on the role of the teacher have changed considerably throughout history. Teachers' tasks were differently viewed by the Herbartians than the advocates of the new mainstream education. Despite such rich experience from the past, contemporary school is still going through a crisis (...). Such a vision is opposed by new trends aimed at building a "different school", open to the surrounding world, creative and progressive, which stimulates students to independent initiative, accustoms students to self-education, shapes their interests. The proposal to create such a school sets a completely new role for the teacher in the process of education. Currently, teachers do not fulfil their social role, but they are actively involved in co-creating it" (Teśluk 1999, p. 96). Teśluk also attempted to present a synthetic image of a creative teacher, in which she sums up all his or her significant competencies, skills and predispositions, when she writes: "(...) a creative teacher is an ingenious teacher, open to other people's ideas, constantly increasing his or her substantive knowledge and upgrading his or her qualifications. They are constantly faced by new didactic and educational situations. Their activities cannot be schematic, formalized, but it also requires constant searching, verification and elaboration of new solutions. A creative teacher fully embraces himself or herself as a person. He accepts himself and recognizes himself in the categories of change and constant movement. A creative teacher ceaselessly searches, studies, experiments and tests different methods of solving problems. He is a person dedicated to what he or she does, responsible, original, persistent in pursuing his or her objectives, characterised by flexible thinking" (Teśluk 1999, p. 97). Teśluk's concept is a perfect résumé of the part of the article, which deals with the problem of the place of creativity among the didactic competencies of the teacher. The author aptly points out the fundamental didactic posed before the teacher, who is open to other people's ideas, constantly seeks, studies, experiments and tests different ways of solving problems. These creative skills of the teacher are the starting point of effective teaching initiatives.

An important area in the discussion on creativity is the problem of impediments in the creative process. An attempt to analyse

this issue can be found among other things in the Nęcka's model discussed above. Among barriers to the development of creativity, the author mentions processes which he considers to be antagonistic to creativity. They include, among others, mechanisms preventing the initiation of the creative process, among which he emphasizes anti-creative beliefs and competition of motives. Further impediments indicated by Nęcka are the mechanisms causing premature termination of interactions, among which the authors mentions impatience for results. Nęcka emphasizes also mechanisms disrupting the free course of the creative interaction, such as competition, pressure and conformism as well as mechanisms depriving the creative interaction of useful directions of development, such as excessive knowledge and mental inertia. In order to counteract the abovementioned impediments, Nęcka and other authors of studies on didactic activities with students (Klus – Stańska 2010, Kožuh 2016, Tokarz 2005 and Urbańska 2014) suggest teachers to dispense with competition and rivalry and replace them with cooperation and interaction of students during their lessons. The leading element of a teacher's meeting with students should be the strategy of creative education, based on sessions training creativity and application of different activating methods (Nęcka 2001, Śliwerski 2007 and Szmidt 2013).

A review of literature reveals that their working environment sometimes proves to be the barrier to the development of the creativity of the teacher and his students. In the teaching and class community, there are situations in which, due to his or her "different" approach to learning or work, a creative teacher or a creative student is not always well-liked and appreciated by other members of the teaching staff or classmates in a school environment (Kožuh 2016). Another impediment in the development and support of students is the ability to prepare the teaching staff at universities.

The teachers' inability to reflect on their own work is sometimes indicated as one of the barriers restricting the creative teaching process. After all a teacher should spare no efforts to make the classes he or she prepares not only a transmission of thorough knowledge, but they should also enable students to understand and implement the acquired knowledge in practical activities. It is also the call for organizing classes for students in such a way as to make them a source of inspiration for independent and creative reflections. Every day, a teacher should allow his or her student "to see what human nature is hiding, what is its spiritual wealth, the potential which makes man an individual consciously realizing themselves" (Śliwerski, 2007, p. 24). In order to make this postulate come true, teachers should realise the need for creativity in their teaching strategies, because patterns of behaviours or learned methods of reacting have become useless in new conditions and different educational situations. Efforts are being made in education " in which there is a place for both freedom and certain discipline, which invariably accompanies every human action" (Pachociński 1998, p. 44). Placing students in a situation of creation may be an event changing their previous beliefs, attitudes and values. A task formulated in this way causes also the necessity to accompany the students on their way through their development during each lesson.

In treatises on creative initiatives of a teacher in the process of education, the necessity of knowledge of the levels of creativity is strongly emphasized. It allows better identification and understanding of creative activity of the teacher, as well as of his or her students. Among the concepts concerning this area, Nęcka's reflections on creativity in the aspect of the stages of life deserve attention (Nęcka 2001). The author suggests distinguishing four levels of creativity indicating the level of liquid creativity, the level of crystallized creativity, the level of mature creativity and the level of outstanding creativity. For the author, the fluid creativity is a kind of potential as well as the necessity to create other types of creativity. From the point of view of this concept, the cognitive components of the liquid creativity are creative ways of functioning of the cognitive processes, and among them mainly cognitive curiosity and the need for something new. So even this level opens up great opportunities for teachers, because a well organized didactic process is full of initiatives, which students should find interesting, surprising and motivating to undertake research activity in this area. In turn, crystallized creativity involves capitalizing on their potential ability in the pursuit of a selected creative objective, e.g. creative solution of a problem. The cognitive elements at this level of creativity are above all the ability to see problems and the ability to think critically. An opportunity for the development of this level of the student's creativity can be a variety of didactic situations, which make the students face the necessity to solve the

problem by seeking creative solutions hitherto unknown. Such opportunities for the teacher are offered by the seeking methods and the strategy of creative solving them. At this level, making use of such methods as brainstorming, T. Buzan's mind map or the Six Thinking Hats method by De Bono (De Bono 2015, Buzan 2014) may prove very helpful in the teacher's didactic workshop. The third level identified by Nęcka is the mature creativity, which consists in taking up important objectives or problems, which from the social point of view are creative and innovative (Nęcka 2001). Working with students within the area of this level may require taking up complex individual or group projects. It should be emphasized that a project as a didactic method is one of the most difficult and demanding initiatives. A project is not only a long-term method of training spread-out over time but, first of all, it is an activity which demands from students very independent design and evaluation of their own work (Kožuh 2017). The final level listed by the author of the concept of creativity levels is the level of outstanding creativity. It should be understood as mature creativity, leading to the creation of works and inventions, which fundamentally change domains of knowledge. From the didactic point of view, this level is a teachers chance to work primarily with particularly gifted students. This also means sustained vertical and horizontal expansion of student's knowledge and giving him or her assignments which require operating skills of the highest creative potential. Such approach to the development of possibilities to seek creative solutions is a very important recommendation for every teacher. The presented typology results, inter alia, in the fact that each level of creativity has its time and place in the process of acquiring skills and knowledge. Therefore, the knowledge of this concept is essential for every teacher planning creative didactic activities. With this knowledge, a teacher has a chance to better understand and diagnose his or her students and then, on the basis of the analysis of their skills, to organize the didactic process more effectively. The foundation of this strategy and its major objective is to stimulate creative thinking of students.

Profound analysis of the issue of creativity as one of the most important didactic challenges for a modern teacher has become a necessity. According to Melosik and Szkudlarek, we live in a "permanent future shock" (Melosik and Szkudlarek 2009, p. 55). Following the pace and understanding of the changes taking place in the world is by no means easy to adults, the more difficult it may prove for a primary school pupil or a high school student. This is why pupils and students often feel lost during school classes and helpless in the face of everyday problems. This uncertainty and confusion of a student sometimes trigger off emotions which head towards aggression in all its possible forms. Such a situation becomes extremely difficult for the teacher then. His or her work, creativity and innovation often become a way out and a step in the right direction

6. EXAMPLES OF EDUCATIONAL INITIATIVES DEVELOPING STUDENTS' CREATIVITY

The modern school is still too often closed in patterns. Too much space in it is devoted to teaching and learning substantive contents at the expense of learning to think. Such a school gives its students too few opportunities to develop their creativity, despite the fact that such a potential is certainly dormant in them. In order to wake them, a creative teacher is needed, who will first of all see and appreciate their creative abilities. A teacher is sought, who is able to find a way to develop the potential found and opportunities dormant in the students. Schools should more often and more than evaluate students, arouse their passion for learning and stimulate avocation for acquiring new knowledge. Creating an atmosphere for the development of creativity in school means leaving the student freedom and autonomy in action, as well as consent to his or her mistakes, experiments and risk taking. The creative teacher also inspires students in such a way that they can create situations not fully predetermined or defined in the educational process. In the above-mentioned activities, it is extremely important for the teacher to apply a formative assessment, when referring to the student's work and his or her success, also develops their motivation. The involved student is more willing to take independent action and memorizes the acquired skills and messages with understanding. The most important factors conditioning the creative process and shaping the creative personality of a student often involve a sense of freedom, diligence and problems that are non-standard tasks. An example of this type of challenge for students can be the homework that the students

of one Italian high school in Fermo received for their holidays in 2015. In Italy, due to the climate of this part of Europe, students enjoy a three-month holiday break. During the holidays (so that they do not forget about the school) they are given homework from many subjects in the form of various essays, a rich reading list, the task to prepare various projects and solve an extensive list of math problems. Some school publications even prepare special editions of summer exercises. Among the holiday recommendations in the teacher's list, there were 15 points for the students. Each of the points, though they sounded simple, was not easy at all. The most difficult, as Bloom argued in the taxonomy of cognitive aims developed in the previous century similarly to other didactic process theorists (Półturzycki 2013) are the tasks belonging to the category requiring the ability to solve unusual tasks, their creative analysis, evaluation, suggesting, predicting and assessment. These were the holiday tasks Cesare Cata set up for his students. This graduate of philosophy at an Italian university and of doctoral studies in the US is convinced that nowadays educational environments need a more innovative school model. In his opinion, school should encourage students more to love learning than to assess them. Moreover, school should stimulate the passion for acquiring knowledge.

Students in a high school specializing in humanities learning Italian, taught by Cata, carry out various and unique initiatives. One of them was their homework for holidays, formulated in a list containing 15 points.

The first task required the student to take a walk along the seashore in complete loneliness a few times in the morning; to look how the sun reflects in the water and thinking about the most beloved things in the world, to feel happy. The second one was to try to use the new expressions the student had learnt that year; the more he or she could say meant the more he or she could think, and the more free he or she was. The third assignment was to read, as it was the best form of rebellion the student could have – by reading he or she would feel like swallows in flight. The fourth one asked to avoid all things, situations and people that cause negative feelings or emptiness. The fifth one advised the student not to worry if he or she felt sad or scared, as summer, like all beautiful things, might cause confusion in people's souls. At the same time it assigned a task to try to keep a diary to describe the student's state of mind, and in September – if you he or she felt like doing it – it could be read as the next point. The sixth exercise was to watch at least one sunrise in solitude. The seventh one asked not to be ashamed to dance. The eighth task was not swear. The ninth point of homework was to be kind. The tenth one asked the student to watch good movies with moving dialogues. The eleventh task was to review the notes from the student's Italian lessons. The twelfth assignment was to practice a lot of sports. The thirteenth one advised the student if he or she met a person who hurt them to talk about it frankly. The fourteenth point asked the student to be as cheerful as the sun and as unrestrained as the sea. And the last, fifteenth one, told the students to behave themselves. The homework constructed in such a way certainly contains not only the theoretical assumptions of creative work with the students in the educational process that I have described above, but also refers to specific practical activities in its form. They are tasks of innovative, unconventional, non-schematic nature and they require students to create an independent project during their implementation.

Examples of didactic tasks developing creativity of the students can be found in almost every school on every continent. They differ only in the quality and substantive content, the frequency of application and the method of didactic implementation together with the process of evaluation and reflection of the teachers. Theoretical assumptions and the practice of creative development of students find application in problem-related tasks, which are no longer a rarity in school. A task from the area of literature, for example, can be as follows: imagine that you are Umberto Eco (Plato, Pablo Picasso or William Shakespeare) and you intend to become the Minister of Culture and Art (or the Director of the Institute of Literature and Art) - write a cover letter in which you will present your past achievements and attempt to define an action plan for this position. Another example of a creative task in the field of language and art: arrange an interview with Paul Gauguin, containing questions and answers, e.g. What or whom do you most often paint? What do you discuss with Vincent van Gogh about? Are you closer to Fauvism or to Symbolism? What role does your fascination with Impressionism play in your work?

7. CREATIVITY AS THE FOUNDATION OF ALL DIDACTIC ACTIVITIES OF THE TEACHER

In didactic situations, theoretical assumptions are usually well planned and skilfully implemented. Teachers are familiar with the theory of teaching and the wealth of methods developing creative thinking. Such methods certainly include unfinished sentences and unfinished stories, brainstorming, mind map and others. A teacher of Polish elementary school knew this well, when she asked her students to complete a story beginning with a fragment of a sentence that read: "When Magda opened her eyes ...". A ten-year-old student of Polish primary school managed this task perfectly, preparing the following story: When Magda opened her eyes, she saw a magpie that tapped its beak on the parapet of an open window. It was spring, so birds came. Madzia was surprised because a number ten had also arrived. Magda called her mother, but instead of her mother, a cat came. Magda said: Mom? The cat: Yes, my daughter. Then Magda called her Dad. Instead of her dad, a panda came. Madzia said; Dad, is that you? The panda said: I am. Then Magda went downstairs to the hamster. Instead of the hamster, she saw Garfield in front of the TV. Suddenly the doorbell rang. She opened the door and saw the Illuminati who gave her a parcel. Madzia said good-bye to Illuminati. Illuminati walked away and was run over by the cat-roller. In the meantime, Magda opened the package and saw a portal, so she entered it and found herself in the inverse world. After an hour she reached her home. She went to the kitchen to have something to eat and drink, and saw a beaver who fried pancakes on a frying pan. She took the bread from the drawer. She was surprised because the bread had legs and hands and it walked into Magda's mouth. Magda enjoyed eating it. She poured herself some water that splashed all over her. Madzia woke up and it turned out that it was just a dream."

The teacher did much worse with the task than her student. In her assessment, she not only failed to recognize the creative potential of her student, but also committed a number of other didactic mistakes in evaluation of his work. Her assessment was expressed by a red line crossing out the entire text written by the student and a commentary written underneath: "Please, correct the story and write something sensible. You are supposed to write maximum 8 sentences".

Such an assessment done by a teacher is difficult to comment on. Not only was she unable to see the unlimited layers of imagination and fantasy, which are a measure of creativity, but she also tried to limit and enclose the student's creative story in the diagram of eight sentences. Wrong assessment of a student violates a number of didactic and ethical principles in the process of education. The above task also shows, on the one hand, good theoretical assumptions both in the field of education and in the area of initiating creative development of the students, and on the other hand, it points out the poor practice in recognizing their creative development. It is just one of many examples of the gap between theory and practice in teachers' work in all areas of education and at all levels of education.

8. CONCLUSIONS

Education described as creative and innovative has been one of the most desirable features of the school in recent years. In the dynamically changing world, the challenges addressed to students, which consist in creating reality in a non-stereotypical way, are more clearly discerned. Educational activities conducted in this field in various parts of the world are more and more frequently analyzed. Many creative tasks and innovative concepts are also offered by the Polish and European school.

Students need teachers who will provoke them to think creatively and to search for themselves. Modern school needs teachers, who not only transmit knowledge, but let their students experience it as well. The wanted teachers are those, who can be guides in studying, discovering and analysing reality by their students.

Teachers wanting to perform their functions conscientiously are obliged to constantly seek new ways of conduct and modifying their behaviours. Each new lesson and each new topic discussed with their students and pupils of any age compels them to change the previously assumed lines of acting. Creativity thus becomes a constant element of didactic work of any teacher, because the unknown and risk are ceaselessly connected with the educational reality in which it operates. For modern teachers it means a change in their role. Nowadays,

teachers passing judgements and all-knowing experts are not necessary any more, but there is a great demand for teachers who facilitate learning and help in constructing knowledge. This gives rise to the need for creators of safe scientific environment that promotes creative activity of students.

The presented didactic portrait of a creative teacher is evidence of extremely high demands posed to those who would like to meet the desired style of work with a student. So the question arises about who could be able to meet such exorbitant expectations. This raises the question of who would be able to meet such high expectations. Should we revert to the belief that the teaching profession can only be performed by people with the so-called "vocation"? Or maybe there is a chance to develop and improve competencies in the process of training students and adepts of the teaching profession, which would allow teachers to pursue their profession in a creative way? Creative attitudes among students usually develop due to a positive didactic environment and a positive image of themselves. New, creative ideas come up when students seek and see the necessity of constant changes. This is possible only when such activities are accompanied by a full commitment from the creative teacher, as well as the inquisitiveness and inner motivation of the active students.

Conflict of interests

Author declares no conflict of interest

REFERENCES

Adamek, I., Bałachowicz, J., & Impuls, O. W. (Eds.). (2014). *Kompetencje kreatywne nauczyciela wczesnej edukacji dziecka.* [Creative competence of an early childhood education teacher] Oficyna Wydawnicza" Impuls". Retrieved from: http://cejsh.icm.edu.pl/cejsh/element/bwmeta1.element.desklight-4c717862-1dbc-4eaa-9bc0-e32a4dbe811d

Anderson, L. W., Krathwohl, D. R., & Airasian, P. W. (2000). *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives.* Retrieved from: https://www.semanticscholar.org/paper/A-Taxonomy-for-Learning%2C-Teaching%2C-and-Assessing%3A-A-Anderson-Krathwohl/23eb5e20e7985fca5625548d2ee6d781a2861d41

Buzan, T. (2014). *Mapy twoich myśli.* [Maps of your thoughts], Wydawnictwo: Aha. Łódź. Retrieved from: https://www.gwp.pl/mapy-twoich-mysli.pdf

De Bono, E. (2015). Myślenie lateralne. [Lateral thinking]. Wydawnictwo: StudioEMKA Warszawa. Retrieved from: https://www.empik.com/myslenie-lateralne-de-bono-edward,p1109017106,ksiazka-p

Dobrołowicz, W. (1995). *Psychodydaktyka kreatywności.* [Psycho-didactics of creativity]. Wyższa Szkoła Pedagogiki Specjalnej im. Marii Grzegorzewskiej.

Edwards, C., Gandini, L., & Forman, G. (Eds.). (2011). *The Hundred Languages of Children: The Reggio Emilia Experience in Transformation: The Reggio Emilia Experience in Transformation*. ABC-CLIO. Retrieved from: https://books.google.rs/books?hl=en&lr=&id=LEgm-z5fos4C&oi=fnd&pg=PP1&dq=Edwards,+C,+Gandini,+L.+(2011).+The+hundred+languages+of+children:+The+Reggio+Emilia+experience+in+transformation.+Santa+Barbara,+California&ots=mp_AjI9tcX&sig=hbA_S0g0wrpWPnyMRbMA_r_UTOY&redir_esc=y#v=onepage&q=Edwards%2C%20C%2C%20Gandini%2C%20L.%20(2011).%20The%20hundred%20languages%20of%20children%3A%20The%20Reggio%20Emilia%20experience%20in%20transformation.%20Santa%20Barbara%2C%20California&f=false

Giza, T. (2006). *Socjopedagogiczne uwarunkowania procesÁłw identyfikowania oraz rozwoju zdolności uczniów w szkole.* [Socio-pedagogical conditioning of identification processes and development of students' abilities at school], Wydawnictwo Akademii Świętokrzyskiej. Kielce. Retrieved from: https://tezeusz.pl/socjopedagogiczne-uwarunkowania-procesow-identyfikowania-oraz-rozwoju-zdolnosci-uczniow-w-szkole-1545600

Klus-Stańska, D. (2010). *Dydaktyka wobec chaosu pojęć i zdarzeń.* [Teaching in the face of chaos of concepts and events], Wydawnictwo Akademickie" Żak". Retrieved from: http://terazniejszosc.dsw.edu.pl/fileadmin/user_upload/wydawnictwo/TCE/2011_53_7.pdf

Kožuh, A. (2016). Kreatywność jako niezbędny element kompetencji nauczyciela w edukacji alternatywnej. [Creativity as an essential element of teacher's competence in alternative education], *Państwo i Społeczeństwo, 16(2),* 39-54. Wydawnictwo: Oficyna Wydawnicza KA AFM. Retrieved from: https://www.ceeol.com/search/article-detail?id=586144

Kožuh, A. (2017). *Active pupils at school*. Založništvo in izdelava -Koper: University of Primorska Press, Retrieved from: https://plus.si.cobiss.net/opac7/bib/search?q=slovenija&db=cobib&mat=allmaterials&auf=coti%C4%8D%2C+mara&tgf=odrasli&tyf=0_knj&ucf=37.091.3&laf=eng

Kwaśnica, R. (2007). *Dwie racjonalności: od filozofii sensu ku pedagogice ogólnej.* [Two rationalities. From the philosophy of sense to general pedagogy], Wydawnictwo Naukowe Dolnośląskiej Szkoły Wyższej Edukacji TWP we Wrocławiu. Retrieved from: https://opub.dsw.edu.pl/bitstream/11479/138/1/Dwie_racjonalnosci.pdf

Limont, W. (2005). *Wykorzystanie myślenia metaforycznego w edukacji ku twórczości.* [Making use of metaphorical thinking in education encouraging creativity]: in A. Tokarz (Ed.). W poszukiwaniu zastosowań psychologii twórczości (ss.93 – 123). [In quest of applications of the psychology of creativity],

Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków. Retrieved from: http://www.zea.umk.pl/wieslawa-limont/

Łukasiewicz, M. (2007). *Mistrzostwo. Jak pobijać własne rekordy w szybkim i skutecznym uczeniu się.* [Expert skill. How to break your own records in fast and effective learning], Wydawnictwo: Rebis. Poznań.

Melosik, Z., & Szkudlarek, T. (2009). *Kultura, tożsamość i edukacja: migotanie znaczeń.* [Culture, identity, and education. Fluttering meanings]. Oficyna Wydawnicza Impuls. Retrieved from: http://swarzedz.pbp.poznan.pl/files/kultura.pdf

Moroz, H. (1996). *Rozwijanie twórczości w procesie kształcenia nauczycieli*. [Developing creativity in the teacher education process] In: S. Juszczyk (Ed.). Twórczy rozwój nauczyciela. [Creative development of teachers]. Wydawnictwo: Impuls. Kraków.

Nęcka, E. (1998). *Trening twórczości, Podręcznik dla psychologów, pedagogów i nauczycieli.* [Training creativity. A hand book for psychologists, educators and teachers], Oficyna Wydawnicza: Impuls, Kraków. Retrieved from: https://integro.ciniba.edu.pl/integro/191800870905/necka-edward/trening-tworczosci, https://fbc.pionier.net.pl/details/nnzggf6

Nęcka, E. (2001). *Psychologia twórczości.* [Psychology of creativity], Gdańskie Wydawnictwo Psychologiczne. Gdańsk. Retrieved from: https://www.scribd.com/document/371869239/E-Necka-Psychologia-Tworczosci

Nęcka, E., Orzechowski J., Słabosz A., Szymura B. (2005). [Training creativity], Gdanskie Wydawnictwo Psychologiczne, Gdańsk. Retrieved from: https://usosweb.aps.edu.pl/kontroler.php?_action=katalog2%2Fprzedmioty%2FpokazPrzedmiot&kod=10-1S-TKR&lang=en

Olearczyk, T. (2010). *Pedagogia ciszy.* [Pedagogy of silence]. Wydawnicwto: WAM, Kraków.

Pachociński, R. (1998). *Podstawy kształcenia wyższych umiejętności poznawczych w nowoczesnej szkole.* [Basics of teaching high er cognitive skills in a modern school], Wydawnictwo Instytutu Badań Edukacyjnych, Warszawa.

Popek, S. (2001). *Człowiek jako jednostka twórcza.* [Man as a creative individual], Wydaw. Uniwersytetu Marii Curie-Skłodowskiej, Lublin.

Półturzycki, J. (2013). *Dydaktyka dla nauczycieli.* [Didactics for teachers], Wydawnictwo: Adam Marszałek, Toruń. Retrieved from: https://tezeusz.pl/dydaktyka-dla-nauczycieli-jozef-polturzycki

Renzulli, J. S. (1976). The enrichment triad model: a guide for developing defensible programs for the gifted and talented. *Gifted Child Quarterly, 20(3),* 303–306. https://doi.org/10.1177/001698627602000327

Renzulli, J. S., & Reis, S. M. (2009). *Light up your child's mind: Finding a unique pathway to happiness and success. Little, Brown.* Retrieved from: https://s3.amazonaws.com/academia.edu.documents/34624962/GTI_2010.pdf?response-content-disposition=inline%3B%20filename%3DA_new_look_at_creative_giftedness.pdf&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAIWOWYYGZ2Y53UL3A%2F20200302%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20200302T082940Z&X-Amz-Expires=3600&X-Amz-SignedHeaders=host&X-Amz-Signature=5debef00084704031503d042e0fc3dceca209aeeda07ee505c84720615b9c89a#page=128

Smak, E. (2014). *Innowatyka w edukacji.* [Innovativeness in education], Wydawnictwo: Nowik, Opole. Retrieved from: https://www.nowik.com.pl/product/innowatyka-w-edukacji

Szmidt, K. (2013). *Trening kreatywności.* [Training creativity], Wydawnictwo: Helion, Gliwice. Retrieved from: https://pdf.helion.pl/trekr2/trekr2.pdf

Śliwerski, B. (2007). *Wychowanie. Pojęcia – znaczenia – dylematy.* [Education. Concepts – meanings – dilemmas], In: M. Dudzikowa, M. Czerepaniak – Walczak (Eds.). Wychowanie. Pojęcia. Konteksty. (Education. Concepts. Contexts.] Wydawnictwo: GWP, Gdańsk. Retrieved from: https://www.gwp.pl/wychowanie-tom-1-pojecia-procesy-konteksty-istota-i-sens-wychowania-wokol-kontekstow-i-znaczen.pdf

Teśluk, M. (1999). *Nauczyciel - kreator w reformowanej szkole.* [Teacher – a wizard in the reformed school], In: J. Łaszczyk (Ed). Pedagogika czasu przemian. [Pedagogy of the time of change] Wydawnicwto: ZM WSPS,Warszawa. Retrieved from: https://integro.ciniba.edu.pl/integro/191800824077/ksiazka/pedagogika-czasu-przemian

Tokarz, A. (2005). *Dynamika procesu twórczego*. [The dynamics of the creative process], Kraków: Wydawnictwo Uniwersytetu Jagiellońskiego. Retrieved from: https://www.medicon.pl/dynamika-procesu-tworczego/2980

Urbańska, E. (2014). Rola twórczości zawodowej nauczycieli w procesie rozwoju współczesnej szkoły. [The role of teachers' professional creativity in the development process of the contemporary school. Educational Quarterly], *Kwartalnik Edukacyjny* 2014 nr 1 pp 55-61. Warszawa. Retrieved from: http://www.bpsiedlce.pl/1/strona/81_zestawienia-bibliograficzne/287_psychologia/182_kreatywnosc/

Żechowska, B. (1996). *O twórczym rozwoju nauczyciela refleksji kilka.* [A few reflections on the creative development of teachers] In: S. Juszczyk (Ed). Twórczy rozwój nauczyciela. [Creative development of teachers], Wydawnictwo: Impuls, Kraków. Retrieved from: https://allegro.pl/oferta/tworczy-rozwoj-nauczyciela-stanislaw-juszczyk-7931724185

Włochy: wyjątkowa praca domowa na lato dla uczniów liceum – strona internetowa [Italy: exceptional summer homework for high school students], Retrieved June, 11.2015. http://wiadomosci.onet.pl/swiat/wlochy-wyjatkowa-praca-domowa-na-lato-dla-uczniow-liceum/5ddhtk

Wrocław. Wyborcza: 10 – letni Natan napisał opowiadanie – strona internetowa [Ten-year-old Natan wrote a short-story], Retrieved July, 24.2018. http://wroclaw.wyborcza.pl/wroclaw/7,35771,23416369,10-letni-natan-napisal-opowiadanie-nauczycielka-kazala-poprawic.html

THEORETICAL BASIS AND MODELS FOR DEVELOPING STUDENTS' VALUES IN PRIMARY EDUCATION

MSc Violeta Panev - OOU Vlado Tasevski, Skopje, Macedonia
E-mail: violetapanev@yahoo.com

ARTICLE INFO

Review Article
Received: January, 09.2020.
Revised: February, 10.2020.
Accepted: February, 24.2020.
doi: 10.5937/IJCRSEE2001081P

UDK
37.015.31-057.87

Keywords:
value based education,
values,
values orientations,
primary school,
theoretical models.

ABSTRACT

Values are the core in the educational process both from a theoretical point of view and from the aspect of the teaching practice. The school assumes the main function in values' acquisition in pupils and as a public institution it produces the values of the wider social community and society. In acquiring the values in the school, not only parents and teachers' influence takes place, but the background is a colourful diversity of political, social, economic, religious and cultural values of various groups and interests. The priority of selected values in a school curriculum represents a palette of life activities in the school and also the life events beyond the social community. They should be carefully chosen, realized and valued. Their realization does not ooften take place in an easy way because the values are not explicitly represented in the curriculum and are not equally understood by all subjects in the teaching practice. The acquisition of primary values in young people increases the possibility for favourable development of other values and forming a complete personality. Therefore, this paper will try to present several theoretical models of educational practice that support opportunities for teaching character and students' values acquisition in a modern school environment. The models themselves contribute to the development and acquisition of given values in the pupils. Some of them are complement and create possibility to solve some current issues from everyday school life and enable an easier transition from traditional to modern teaching practice.

1. INTRODUCTION

Values are defined as a concept that hold within something good (beauty, love, honesty, etc.) and as a personal and social choice rather than a preference. They are related to the beliefs, attitudes, and feelings that an individual desires. Values are also defined as objects, activities; experiences that promote wellbeing, a term elaborated further in this paper that is a result of an existence and practice of values. In the philosophical debates in the lists of Schwartz (10 value types) and Rockych list of 36 fundamental values (Rokeach, 1973), values are described and named as principles and fundamental beliefs and standards which serve as guidelines for our behaviour or preferences, decisions and beliefs.

Closely related to the theme of values are the relatively enduring goals of value based education that an individual or a group of people want to develop and acquire in the pupils. "These goals constitute the value system that corresponds to the hierarchy of universal values from which general values are derived, but an individual also learns according to the values he chooses himself, according to his abilities and life opportunities." (Mijatovic et all, 1999, p.655).

Educational goals, whether value-based or cognitive are inseparable, and their study and understanding helps pupils develop and nurture values in order to be their true determinant of a life filled with honesty, integrity, justice, care, and respect for others and help to make them responsible citizens who appreciate beauty and nature.

Corresponding Author
MSc Violeta Panev - OOU Vlado Tasevski, Skopje, Macedonia
E-mail: violetapanev@yahoo.com

2. THEORETICAL MODELS AS A TOOL FOR VALUE-BASED EDUCATION, FORMING AND DEVELOPING VALUES

Values are central to the educational process, both theoretically and in terms of teaching practice. The school, with its teaching staff and family members, assumes the main function of their adoption, but as a public institution it also undertakes and produces the values of the wider community and the whole society.

The school today is often a place of struggle for different values priorities and opportunities for dominant influence of different subjects and groups. However, what priorities will be of utmost importance to the school community is identified in the process of the school itself: organization, actions, curriculum, planning, work environment, discipline and communication between teachers, and school staff. Their implementation is not often easy to do because values are not explicitly represented in the curriculum and are not equally understood by all subjects in the teaching practice.

In this paper we will present theoretical models of educational practice that offer opportunities for successful realization and adoption of values in pupils in a modern school environment. Some of them are intertwined and represent an opportunity to overcome some current problems in everyday school life and help to establish an easier transition from traditional to modern teaching practice. We made a theoretical research on the theory of the positive psychology of Dr. Martin Seligman and the VIA list of 24 character values so-called personality strengths; then Carol Dweck's theory of fixed mindset and growth mindset especially useful in the enhancing the value orientations in young people; and the learning theory of "flow" developed by Mihály Csíkszentmihályi with the teacher-set activities that arouse excitement, interest and achievement in learning and others.

Acquiring individual values in young people in these models increased the potential for favourable development and learning of other values in pupils and took the opportunity of forming complete and quality young persons. One of the reasons for pupils' misbehaviour and communication difficulties both in and outside the school learning environment still is the lack of sufficiently acquired and thoroughly adopted values. According to this we can state that pupils' acquisition of values and development of value orientations closely corresponds to the favourable school climate, discipline and the degree of values development of the school curriculum. For example, if pupils develop the value of diligence and work habits, they would be able to develop the value of perseverance and grit and achieve better learning outcomes, or if the value of peace climate develops, the pupils would be able to develop empathy and to cooperate more successfully with each other and minimize the disciplinary problems of violence and conflicts that take away time during the lesson. In line with this starting point, we have explored three theoretical models that help foster and shape young people's values. They cover all phases of this process, from their cognitive and emotional level of acquisition to their realization or action. Acting in harmony with these beliefs certainly requires a reinforcement of one's positive qualities, will, and a personality.

2.1. Dr. Martin Selingman`s positive psychology and the science of character (24 character strengths)

The Positive Psychology is a branch of psychology that studies human strengths, virtues and the factors that contribute to a fulfilling and meaningful life. It has three central pillars: positive experiences, positive individual traits and positive institutions. The founder and leader of Positive Psychology is Dr. Martin Seligman, who is known for research such as perseverance, learned helplessness, depression, optimism and pessimism and is a recognized authority in the field of well-being. The theme of the positive psychology, according to him, is well-being, the golden standard for measuring and evaluating it is the blooming personality, while the goal of positive psychology is flourishing.

In his latest book, "Flourish," which deals precisely with the blossoming of the human personality, Seligman explains "The Theory of Well-being" and the way it can be measured. He thinks that five elements of "well-being" which are contained in the acronym PERMA are necessary. They are: P- Positive emotion, E-Engagement, R- Relationships, M- Meaning and A- Achievement. According to him, "Positive emotion" means a positive feeling that can only be assessed subjectively; "Engagement" means involvement in a state of flow which is a pleasant activity for the

person performing it; "Relationships" are relations with friends, family, intimate and/or social relationships; "Meaning" is a sense of fulfilment and significance to serve and belong to something greater than oneself and "I"; and "Accomplishment" is an achievement, success that is attained even when it does not bring positive emotions, or is not associated with positive relationships. Seligman (2011) believes that these five elements can help people achieve a life of fulfilment, happiness and meaning. This model can also be applied to institutions to develop programs to help people acquire new cognitive and emotional tools. (see Figure 1)

Figure 1. The five pillars of the PERMA Model (Martin Seligman, 2018)

As part of well-being, happiness itself does not make sense for life, that is, it is not enough. Seligman points to what enables nurturing talents and building deep, lasting relationships with others; the way to enjoy pleasure, and how to make a significant contribution to the world, in a word, he shows what enables an individual to flourish. Wellbeing occupies the central and primary front part in the model, and Happiness (or positive emotion) becomes one of the five pillars of positive psychology, i.e. the theory of well-being called PERMA as the constant building blocks for a life of deep fulfilment. Neither of them defines well-being, but each of them leads to it. Thus he distinguishes the theory of happiness (Seligman, 2011) which is reflected only in life satisfaction and the theory of well-being, which besides happiness rests on the five aforementioned pillars.

Seligman guides us how to apply the PERMA model to people's lives through the five pillars: a positive perspective, engagement in the activities that make people happy, focusing on quality relationships with other people and family, leading meaningful lives and striving for new achievements. His two-decade work on building optimism, motivation and character shows how to get the most out of a life, discovering a new wellbeing theory of what makes life good for individuals and for communities and nations as well as; the way innovative schools can educate about fulfilling life, and not just how to succeed at work; and how corporations can simultaneously improve performance and increase employees' well-being.

In addition to Schwartz and Rockych lists (Schwartz, 1994, 2012) which are used for a long time in value research in different social groups and national areas, Seligman gives us a list of 24 character strengths he uses in his research theory of well-being as the basis of the five pillars. The deployment of the highest character forces leads to more positive emotions, meaningful life, more accomplishment and better relationships. They are the following, listed in the order of the VIA List: Creativity, Curiosity, Judgment, Love of learning, Perspective, Bravery, Perseverance, Honesty, Zest, Love, Kindness, Social intelligence, Teamwork, Fairness, Leadership, Forgiveness, Humility and modesty, Prudence, Self-regulation, Appreciation of beauty and excellence, Gratitude, Hope, Humour and Spirituality.

Figure 2. VIA list of 24 Character Forces and 6 virtuous categories
Values in action character strengths (Peterson and Seligman, 2004)

These values are classified or re-grouped into six character bases, i.e. Virtues categories of life flourishing, each category as a subgroup area encompassing more character strengths. (see Figure 2) They are: wisdom, courage, humanity, justice, restraint and transcendence. This classification is the skeleton of the science of positive psychology so called Character Strengths and Virtues (Peterson and Seligman, 2004). The subgroups are:

• Wisdom and knowledge: Creativity, Curiosity, Open-mindedness, Love of Learning, Perspective;

• Courage: Bravery, Perseverance, Integrity, Vitality;

• Humanity: Love, Kindness and Social Intelligence;

• Justice: Citizenship, Fairness and Leadership;

• Temperance: Forgiveness and Mercy, Humility/Modesty, Prudence and Self-Regulation;

• Transcendence: Appreciation of Beauty and Excellence, Gratitude, Hope, Humor and Spirituality.

Dr Martin Seligman says: "Character Strengths are the spine of PERMA. When you recognize and act on your character strengths, it gives you more positive emotions, more engagement, better relationships and more meaning, and thus greater accomplishment. Character strengths (listed above) are physical health, the more you have, the more you are PERMA" (Seligman, 2019). Regarding how schools should use this model and use it in the educational process, he argues that the goals of the school are two, one is to produce learning that is a traditional goal, and the other is to build well-being, which means to increase PERMA realization to a higher level. Learning is, in a way, covered by A in PERMA, where A stands for accomplishment, realization. But more important is the P-positive emotion and E-engagement. The better the pupil's relationship with the teacher, the more M-meaning reinforces A-learning achievement. If PERMA is increased, the realization of children's learning in the school will increase too. If their learning increases, so does PERMA.

With regard to the empirical validation of his theory, he recommends that if PERMA is the goal set in the classroom, it should be measured. Ways of measuring are an option and different creative opportunities for teachers, which are a process that needs to be repeated and determined if a way is found how to increase PERMA at the appropriate location, or school.

Dave Levin, (2019) winner of many

awards in value education and leader of the most successful and renown public school in the United States (KIPP & Relay GSE) shows us how useful it is when teachers apply these guidelines and maximize their pupils' participation and learning achievement. Through classes, discussions, interviews, and collaborations with pupils, teachers, and great educators of this century, he provides us with the opportunity and image of integrating character-based objectives throughout the lessons in learning different subject areas. Practical lessons show the primary values of his school institution and their daily realization in all subjects. Their elaboration here would be quite time consuming and we will not describe them in detail, but we will focus on the part of the evaluation of values development and the CGC (Character Growth Card) instrument used in his institution. Through it we will build on the second theoretical model of Dr. Carol Dweck's Fixed and Growth Mindset.

2.1.1. CGC instrument, evaluation and process description

Riverdale RCS High School (5-8 grade) uses CGC to provide feedback on their pupils' character strengths through in-depth comments in the CGC report which reinforces the message that success is a combination of habits and character strengths. Their practice has led to the following conclusions:

1. Teachers need to understand character strengths thoroughly and pay attention to the discussion of how important they are to the learning. They should also make a self-assessment using the same indicators on the card, enabling them to more fully and personally grasp these concepts, as well as develop empathy and a greater understanding of the challenges their pupils may face in increasing their own personal strengths.

2. Value-based & Character education requires a differentiated approach depending on the age of the students. Homeroom teachers meet twice a month (6 – 8 grades) to discuss the CGC and similar issues. Homeroom teachers of the same grade level come to these meetings once a month to share ideas on the best way to continue working with their grade level students. As sixth graders may have a little understanding of what these character strengths mean or what they look like, more effort and time is devoted to explicitly defining character strengths so that they thoroughly understand this area confidently. On the other hand, since the 8th grade have already got some experience with SGS for at least two years, discussions at the school are guided on a higher level by a quick overview of character strengths at the beginning of the school year and based on this a more subtle and implicit discussion of the strengths.

3. Parental involvement is crucial. Involving parents in every step of the process is important to their success. Ideally, communication about CGC related work should start from the school or management coordinator. The register of value vocabulary and language related to CGC in commentary writing makes parents excited and grateful to hear about the school activities done with their sons and daughters with the staff.

Teachers at Riverdale RCS High School use CGC (Character Growth Card) to provide feedback to students on their character strengths and character development through expanded detailed comments and reports written in each grade at the end of the first and third trimester. Once students receive report cards, they are included in a series of reflections. They need to emphasize their strengths and the areas that need improvement noted by a teacher, and select an area to set a goal to be achieved by the following trimester. As examples, Dave Levin sets out several pupils'statements out of which we selected this one:

"I aim to ask more questions this quarter. While I recognize this is hard for me, I know asking questions, both in class, and after, will help me to understand things that have been confusing me all quarter."

Once the student's goals are set, the students send the plan of goals to the teacher who made the suggested area to be improved and to their homeroom teacher. In this way, students' goals can be further enhanced by sharing them and responsibility to others.

This CGC embodies all of the character development models in this paper as a tool or an instrument for enhancing students' values that each school should select and determine as important in a given period.

2.2. Fixed and Growth Mindset - Dr. Carol Dweck

In order to explain Dr. Carol Dweck's theory, we first need to explain the meaning of the word "mindset". If we look for its meaning in the top foreign dictionaries, we will see that it involves a kind of way of thinking, that is, a determined mental beliefs about the

states, things and situations. The Merriam-Webster dictionary (2018) describes it as a "mental attitude or inclination", while a "fixed mindset" as a mental setting that does not allow for new situations. The Oxford Dictionary (2019) defines it as "a set of attitudes held by someone", that is, an established set of attitudes by someone.

Carol Dweck from Standford University, talks about mental attitudes and skills that enhance and optimize long-term learning. In doing so, she addresses the non-cognitive factors that drive successful learning enabled as "academic tenacity" which at the basic level means grit or diligence or disciplined commitment over a long period of time. It is a mental attitude and skill that enables the student to commit to long-term goals and endurance in challenges and learning. She believes that short-term goals cause children feel insufficiently capable and smart and even make them wish to leave school, reducing their desire and interest in learning. Some students bring these thoughts and mental attitude and skills together with them to school, but they can also be learned and developed too. Her research shows that non-cognitive factors are critical to current academic success. The research is done with African-American and Latino groups of urban children from low-income families (7th grade). Non cognitive factors include students' beliefs about themselves, their goals in school, their feelings of social belonging, and their self-regulatory skills. Measuring students' skills and mindset can predict their future performance, thus advocating for interventions that improve students' performance by changing specific ways of thinking and skills, i.e. shifting the "Fixed Mindset" to so called "Growth Mindset". On the question of how it is reflected and recognized in children Carol gives us a description in her book (Dweck 2014 et all, 4). The academically tenacious children exhibit the following characteristics and behaviors:

• They believe that they belong to school both academically and socially, the school is part of them and they see it as a pathway for future goals contributing for the family and the community;

• They are involved in learning, agreeing to get out of their "comfort zone" and learn more viewing the effort positively and postpone their current desires on behalf of school work;

• They see failure as a learning opportunity or problem to be solved, not as a humiliation, lack of their ability or not belonging to the group;

• They remain engaged in long-term learning and deploy new strategies for effective advancement.

Longitudinal intelligence research she has done shows that students' mindset predicts their academic performance in real terms. Namely, students with growth mindset show continuous improvement, and those with fixed mindset show no improvement even though their entrance tests at the institution show the same number of achievement points.

In 2007, Carol Dweck published a study article with 373 middle school students. She asked every child a simple question: "Is intelligence something very basic that really can't really change?" She sorted their respective answers into two fascinating groups. The kids from the "fixed mindset" group who answered yes were really good at learning and solid in knowledge. The other malleable group responded with a no, advocating that the intelligence can actually change. After a period of monitoring the respondents, Dr. Dweck discovered that the children in the first group were more concerned about looking smart than about the learning itself. When faced with setbacks, they perceive it as a crucial and a intrinsic failure, so they stop trying to learn. They had a negative attitude toward investing effort as a sign of low achieving, holding an attitude that a talented and intelligent person does not need to work hard in order to succeed. On the other hand, those with the attitude that intelligence can improve over time, were more interested in the learning for learning's sake. They were more willing to take risks even though they made mistakes. They worked hard because they thought they could become better. When faced with failure, they strategically regrouped and then tried again. They saw mistakes as opportunities to improve, learn and grow. Dr. Dweck calls this attitude "growth mindset". There are three attributes to being in a growth mindset: investing effort into learning, using good strategies and proactive help-seeking. That is why teachers are required to focus on the learning process, not just the product or outcome or grades. She points the power of the "yet" on the way to learning against the tyranny of the "now" in achieving results. Along the way it is very important for teachers to pay attention to the psychological moment when children face difficulties and struggle to do something. The teachers should identify those key moments and verbalize it with an appropriate vocabulary during the

pedagogical guidance help. The same "value vocabulary" should be used to designate an error as an interesting, starting point for learning, grit and effort as entertainment, and awareness of not knowing the facts as an opportunity to know more. Reasonable praise during a child's specific process of achieving something encourages motivation and confidence, focusing more on activities that lead to success, and less on the product. Such a concept implies values exemplified by the teacher and values acquired by the student such as diligence, persistence, perseverance and optimism (Dweck, 2015). The following statements are an example of such communication:

• You are good at drawing, I like the detail you put on the girl's face.

• You have really learned about the test, you've read it many times, highlighted it and tested yourself, really worth it!

• I like the way you try different math strategies until you have come to the right solution.

• I like that you took part in the science project. It will take a long time to research, draw and do, and you will learn a lot along the way.

• Wow, this is hard, this is fun.

• Here's a wonderful mistake, let's see what we can learn from it, mistakes are wonderful.

"The Growth mindset" allow children to gain more confidence and endurance as well. Changing their mindset or attitude when they are out of the comfort zone and face difficulty or effort to master something, leads to greater connections of neurons in the brain which makes them smarter and achieves higher results and grades.

Carol Dweck works to develop the mindset of young people always emphasizing the power of the word yet in helping children on the road to success. Not yet does not mean failure on the path of learning and escaping difficulty, but it means that the skills are developed with grit and effort. The education is not about now, but about yet, the education is focused on tomorrow, not on good grades. Otherwise future students and workers are created who are accustomed to and depend on constant reward. How to cross the bridge to yet? She says praise should be reasonable, because praising talent and intelligence makes students vulnerable. Dweck says: "Don't tell your kids they are smart. Three decades researches show that focusing on 'process' - not intelligence or ability - is the key to school and life success" (Dweck, 2015). The school should provide a "growth mindset" learning environment that will enable equal access to education for all. This theory has changed the meaning of the word difficulty and effort in learning, from the meaning of the learner's inability to learn to possibility to become smarter and more intelligent, where "difficulty" means "not yet". However, the teacher may be stuck in his or her own fixed mindset, i.e., see some students as a problem children, not as a puzzle, and deprive those children who achieve results of being able to move forward and to work even harder. We believe that additional forms of training the teachers as a result of insufficient pedagogical competences acquired in initial education and teaching practice will take place to realize the value-based educational goals successfully.

2.2.1. Strategies for Development of Growth Mindset

Dweck's discovery of "fixed & growth mindsets" changes our understanding of learning and the relationship between mindsets and achievements. Research on the plasticity of the brain suggests that the connection between neurons can change with experience. With action and practice, neuroscience creates new connections, reinforces existing ones and builds insulation that accelerates impulse transmission. These neuro-scientific discoveries have shown us that we can increase our neurons and cell growth through the actions we take, such as using good strategies, asking questions, practicing and following good eating and sleeping habits.

Therefore, the mental image of students is in the hands of teachers, mentors, parents, and educators who need to take care of its cultivation and growth. The strategies, or the frequently quoted principles for its implementation, are broadly explained, only briefly listed and outlined here:

• Lectures on mindset show the pupils that focused work can bring success;

• Safe place is needed for the pupils to take risks to learn;

• Teachers set micro goals as possibilities of levels of success of the kids;

• Reasonable praise is with focus on process not product work;

• The word "YET" is present during the learning process of effort;

• Mistakes are interesting to approach the solution to the problem;

• Setting high expectations and support;
• Talk about your mindset (students learn from our examples and experiences);
• Students have the opportunity to ask for help;
• Success takes time and effort which does not incapability;
• Development of values of grit and endurance;
• New challenges to learn are not in the comfort zone;
• Use of records for assigned goals which are specific, achievable, measurable;
• Keeping the files of development;
• Allowing children to make mistakes and restart the work to find a solution.

2.3. The Flow - Mihaly Csikszentmihalyi

Mihai Csikszentmihalyi is a Hungarian psychologist known for the psychological concept of "Flow", which signifies a state in which people are so involved in an activity that nothing else seems to matter; the experience is so enjoyable that people will continue to do it even at great cost, for the sheer sake of doing it (Csikszentmihalyi, 1990). He builds this theory on the basis of positive psychology as well, which is of interest to us in terms of the favorable status of students in acquiring and learning values and skills for building personality. He was inspired by the happiness of some people that survived the war and has been exploring the puzzle of "what makes life worth living".

Although according to many studies the scarcity of material resources contributes to a state of misfortune, he notes that the increase in material goods does not lead to happiness in humans. He has been exploring the term happiness for 40 years with a focus on creative people as artists, scientists to find out what has led them to devote their entire lives to activities that made their lives significant and virtuous and worth living. One of the statements of his interviewees is a feeling of ecstasy, an intense feeling in which one does not feel the existence and consciousness. It is not a state of everyday life but a kind of alternative reality, the one possessed by successful ancient civilizations at the peak of their development in the construction and creation of various temples and buildings where they experienced the state of "flow". During the creativity action, a spontaneous process takes the stage that refers to someone who is trained and had developed knowledge and techniques in the appropriate field and feels this sense of creativity without an effort. "For the top poet it is an open door to heaven, for the famous composer it is a self-propelled movement of the hand writing music notes, for the famous fashion designer it is a passion fulfilled when it works best in a 'flow' state, for the athlete's automatic movement, for the poor founder for Sonny it was the idea of a technological innovation's fortune, a process Einstein describes when he creates the theory of relativity." (ibid)

All of these professions can be chosen by our students who can be successful and happy in life, but the "flow" can also be realized at work, that is, the love for the teaching profession or any other to make teachers and people happy regardless of material status.

Central to his theory is creativity as the source of meaning in our lives. "When we are involved, deeply engaged in creativity, we feel we live more fully and fulfillingly than the rest of our life." (ibid, 4) He calls the creative moment "flow", a moment when a person is fully surrendered and engaged in the activity for the sake of it. The ego is gone, time flies, every moment, movement and thought follow one another, the whole being is left to activity, and the skills that the individual possesses are used to the fullest.

2.3.1. Diagram of "FLOW"

The FLOW diagram (Figure 3) represents this state of creative moment with other states close to it and the distant and opposing ones that reflect a given moment of an activity. Mihaly Csikszentmihalyi says that "The best moments usually occur if a person's body or mind is stretched to its limits in a voluntary effort to accomplish something difficult and worthwhile" (Csíkszentmihályi, 2012).

Measuring is precise, the amount of challenge being experienced at a given point is measured several times a day and the degree of skill adopted. For each person, a personal average is calculated as the centre of the diagram. Knowing this given point, one can predict exactly the state of the "flow" when the challenge is greater than average and skills higher than average.

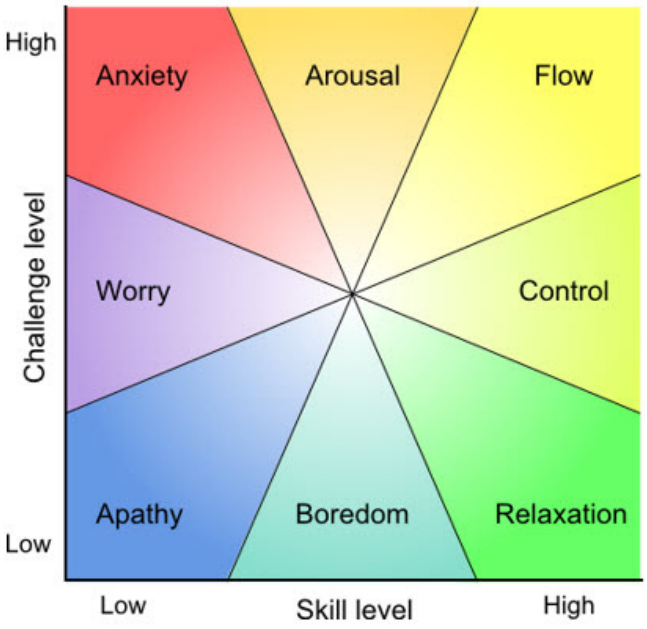

Figure 3. Csikszentmihalyi 's FLOW diagram

The Arousal is a state where there is too much challenge and the skills are not as great as needed but one can easily get to the state of flow with the development of the skill, this is the moment one learns the most because here the person comes out of the comfort zone.

The Control state is also a good place to be at, but there is not much excitement, a condition that is no longer challenging. If the person wants to get into a flow state, the challenge needs to be increased. These two states are complementary and can be easily switched to a flow state.

Other combinations of challenge and skills are less desirable. Relaxation is fine, Boredom starts to become repulsive and Apathy is very negative as there is no feeling that something is being done, the person is not using the skills, as no challenge exists. As the model participant in this experience, he points out to one watching television or using a mobile phone. What we need to do is try to put most of the time in a flow state. And it's a kind of challenge that many people are trying to understand but can't reach without additional help. When it comes to students, that responsibility lies within the teacher.

In the paper these three models in value-based education teaching are exemplified, there exist other models and theories in pedagogical theory but for some of them there is a dilemma regarding the practical implications and teachers' competences to teach in this field.

3. CONCLUSION

These value-based models provide the school with opportunities to face the school challenges of the 21st century and fulfil its function more autonomously in the education process. Values are complemented in the formation of the young man's character and thus all tasks of the education (material, functional and educational) are not treated in isolation but performed simultaneously. The results of these models' research show that the quality school is also possible for students with low family income or students of different cultural and national backgrounds with different GDPs that in the past have often been referred to as reasons for low academic achievement, which is similar to Glasser's description (1994) of what a "quality school" is.

The PERMA model teaches us how to make a fulfilling and happy life with a positive vision of each activity in learning and working. Children being happy in the activities while performing the tasks learn better and become more engaged in the learning activities. In doing so, the teacher needs to know the students well enough to offer them activities that will animate their curiosity and interest in a given activity. This way the goals are higher and the challenge greater in activities that are enjoyable.

The Model of Fixed and Growth Mindset of Carol Dweck focuses on improving the students' mindset and developing their positive

thoughts and abilities through dedication and hard work. The power of positive thinking gives children, teachers, mentors and parents power to change their mindset, become self-confident and improve learning outcomes and academic performance. This theory is especially applicable to students. There are many benefits to cultivating a "growth mindset" in children of all ages and it is never too late to start applying it. Teachers have a wonderful opportunity to influence the children they interact with on a daily basis, and by applying some techniques and strategies and special value vocabulary they can encourage them to develop their way of thinking and learning capacity.

The last model presented here is Mihaly Csikszentmihalyi's model of FLOW or creative experience and refers to high intrinsic motivation where self-consciousness fades, the personality completely surrenders to the present moment activity, and time means nothing, Csíkszentmihályi, 2012 just as skilled musicians plays without thinking and the surfer catches the wave. Mihaly identifies individuals who may experience a "flow" as being autotelic that is, individuals who are self-driving and intrinsically motivated to find the value in themselves, and what they do as an activity is the goal for itself. Almost any of us can improve our ability to experience this creative moment, but there are obstacles to do so. Most often they are in the person within who, if they are students, need the help of a teacher or a parent. He notes that individuals with a low concentration such as children with concentration disorders have difficulty in deepening into the activity and do not feel comfortable performing it (Csikszentmihalyi, 1990). Hence, we suggest that the teacher first has the task to develop the concentration of such children by helping techniques before introducing them to the activities during the lesson time due to the fact that they will not be successfully realized and achieved. This group includes also self-controlled and egocentric individuals and students who are preoccupied with themselves. The same would apply to children who are preoccupied with problems, worries and fears that impede their learning so that they lose opportunities for character development and value acquisition. They are excluded from activities that relate to pleasure and enjoyment and they cannot feel the "flow" moment. However, he points out that "the main inhibitors are social conditions and they are more difficult to overcome such as slavery, exploitation, the destruction of the cultural values that make people's life full of pain and thus lose the pleasure and the need to survive and reproduce." (ibid, 84-85)

The lack of social and ethical standards and social alienation make the experience of "flow" impossible to achieve, hence there is a greater reason to teach values in the school curriculum such as peace, non-discrimination, freedom, love, social intelligence and spirituality. Finally, Mihaly suggests that we can experience this sense of "flow" not only on our own, but also in relationship and communication with others around us, and we would add during the lessons, during an excursion, in a gym, doing experiments or reading literature works in a class. In fact, this is done by sharing the existence of many valuable artefacts and cultural heritage of various origins from the past as well as by transferring scientific knowledge for centuries up to the present moment.

ACKNOWLEDGEMENTS

I would like to express my gratitude to the university professor Phd Aneta Barakoska who supported my work and encouraged me to get results of better quality in the theoretical and field research of my doctoral thesis.

Conflict of interests

Author declares no conflict of interest

REFERENCES

Csikszentmihalyi, M. (1990). Flow. The Psychology of Optimal Experience. New York (HarperPerennial) 1990.

Csíkszentmihályi, Mihály: 19 Wikipedia Articles. (2012). Retrieved April 10, from http://www.markfoster.net/struc/Mihaly_Csikszentmihalyi-wiki.pdf

Dweck, C. (2015). Carol Dweck revisits the growth mindset. Education Week, 35(5), 20-24. https://portal.cornerstonesd.ca/group/yyd5jtk/Documents/Carol%20Dweck%20Growth%20Mindsets.pdf

Dweck, C. S., Walton, G. M., & Cohen, G. L. (2014). Academic Tenacity: Mindsets and Skills that Promote Long-Term Learning. Bill & Melinda Gates Foundation. https://files.eric.ed.gov/fulltext/ED576649.pdf

Dweck, C. S. (2007). The secret to raising smart kids. Scientific American Mind, 18(6), 36-43. https://mindfulbydesign.com/wp-content/uploads/2015/05/4.-The-Secret-To-Raising-Smart-Kids.pdf

Glasser, W. (1994). Kvalitetna skola. [Quality School]. Educa Zagreb.

Levin, D. (2019, April). Character Growth Card. [Video file]. Retreived from https://www.coursera.org/

lecture/teaching-character/character-growth-card-Au73j

MerriamWebster dictionary. Retrieved December 10, 2019 from https://www.merriam-webster.com/dictionary/mindset

Mijatović, A., Vrgoč, H., Peko, A., Mrkonjić, A., & Ledić, J. (Eds.). (1999). Osnove suvremene pedagogije. Hrvatski pedagoško-književni zbor.

Oxford Dictionary (2019). https://www.oxfordlearnersdictionaries.com/definition/english/mindset

Park, N., Peterson, C., & Seligman, M. E. (2004). Strengths of character and well-being. Journal of social and Clinical Psychology, 23(5), 603-619. https://doi.org/10.1521/jscp.23.5.603.50748

Peterson, C., & Seligman, M. E. (2004). Character strengths and virtues: A handbook and classification (Vol. 1). Oxford University Press. https://s3.amazonaws.com/academia.edu.documents/60644288/character-strengths-and-virtues20190919-80486-1xydkjl.pdf?response-content-disposition=inline%3B%20filename%3DCharacter_Strengths_and_Virtues_A_Handbo.pdf&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAIWOWYYGZ2Y53UL3A%2F20200127%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20200127T131302Z&X-Amz-Expires=3600&X-Amz-SignedHeaders=host&X-Amz-Signature=f904766d7aaf3dfe0b7c9d5585d5462f80ff45ec9f78e5a8f070d2becc3bbe6a

Rokeach, M. (1973). The nature of human values. Free press. https://psycnet.apa.org/record/2011-15663-000

Seligman, M. (2011, April) Authentic Hapiness. Retrieved from https://www.authentichappiness.sas.upenn.edu/newsletters/flourishnewsletters/newtheory

Seligman, M. (2018). PERMA and the building blocks of well-being. *The Journal of Positive Psychology, 13(4),* 333-335. https://doi.org/10.1080/17439760.2018.1437466

Seligman, M. (2019). Teaching Character and Creating Positive Classrooms: PERMA - Interview with Dr. Martin Seligman. Retrieved February 10, 2019 from https://www.coursera.org/learn/teaching-character/lecture/j0HF4/perma-interview-with-dr-martin-seligman

Schwartz, S. H. (1994). Are there universal aspects in the structure and contents of human values?. *Journal of social issues, 50(4),* 19-45. https://doi.org/10.1111/j.1540-4560.1994.tb01196.x

Schwartz, S. H. (2012). An overview of the Schwartz theory of basic values. *Online readings in Psychology and Culture, 2(1),* 2307-0919. https://doi.org/10.9707/2307-0919.1116

LIST OF REVIEWERS FOR YEAR 2019

International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE) would like to acknowledge the following reviewers for their assistance with peer review of manuscripts for issues in 2019. Their comments and suggestions were of great help to the authors in improving the quality of their papers. Each of the reviewers listed below returned at least one review for these issues.

Thank you Reviewers!

List of International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE) reviewers in 2019:

- Aleksandar Stojanović, University of Belgrade, Teacher Education Faculty, Serbia
- Aleksandra Karovska Ristovska, Institute of Special Education and Rehabilitation, Faculty of Philosophy, University Ss. Cyril and Methodius, Macedonia
- Ali Bawaneh, Imam Abdulrahman Bin Faisal University, Saudi Arabia
- Alla Belousova, Don State Technical University, Russia
- Amirreza Farahbood, Islamic Azad University Central Tehran Branch, Iran
- Aneta Barakoska, Ss. Cyril and Methodius University in Skopje, Faculty of Philosophy-Department of Pedagogy, Macedonia
- Anna Zhdanko, Don State Technical University, Russia
- Antoaneta Radočaj-Jerković, University of Josip Juraj Strossmayer in Osijek, Academy of Arts and Culture in Osijek, Croatia
- Bakaeva Aleksandrovna, Southern Federal University, Russia
- Belykh Tatiana Viktorovna, Saratov State University, Russia
- Biljana Novković Cvetković, Pedagogical faculty in Vranje, University of Niš, Serbia
- Borce Kostov, Faculty of Philosophy, University St. Cyril and Methodius, Skopje, Republic of Macedonia
- Claudio Gaete-Peralta, Universidad Bernardo O´Higgins, Chile
- Darko B Vukovic, National Research University - Higher School of Economics, ST Petersburg School of Economics and Management, Russia
- Derling Jose Mendoza, Universidad Tecnológica de Israel, Ecuador
- Elena Makarova, Don State Technical University, Rostov-on-Don, Russia
- Elizaveta Sagaidachnaya, Rostov State Economic University, Russia
- Ellenita Garcia Manalaysay, Bulacan State University, Philippines
- Evgeniya Topolska, St Cyril and St Methodius University of Veliko Turnovo-Vratsa Branch, Bulgaria
- Fashuyi Olugbenga, Federal University of Technology Akure Ondo State Nigeria, Nigeria
- Gautam Kumar Baboo, Birla Institute of Technology and Science, Pilani K.K. Birla Goa Campus, India
- Gergana Dyankova, South-West University, Bulgaria
- Grozdanka Gojkov, Serbian Academy of Education Belgrade, Serbia
- Gunawan Gunawan, Universitas Mataram, Indonesia
- Hlystova Elena Viktorovna, Ural State Pedagogical University, Yekaterinburg, Rusia
- Huseyin Uzunboylu, Near East university, Turkey
- Inna Anatoljevna Achjamova, Ekaterinburg Academy of Contemporary Art, Municipal budgetary educational institution of higher education, Russia
- Irina Kibalchenko (Kibal'chenko), Federal State-Owned Educational Autonomy Establishment of Higher Education «Southern Federal University», Russia
- Jihad Jaafar Waham, Universiti Pendidikan Sultan Idris (UPSI), Kuala Lumpur, Malaysia

- Kashif Ishaq, University of the Punjab, Pakistan
- Katarina Zadnik, Academy of music, University of Ljubljana, Slovenia
- Lucky Nindi Marfu'I, University of Indraprasta PGRI, Indonesia
- Łukasz Tomczyk, Pedagogical University of Cracow, Poland
- Lyudmila Kruteleva, Academy of Psychology and Educational Sciences of Southern Federal University, Russia
- Maria Vyshkvyrkina, Southern Federal University, Russia
- Mariana Mateeva Petrova, St.Cyril and St.Methodius University of Veliko Tarnovo, Veliko Tarnovo, Bulgaria
- Marina Bogdanova, Institute of Philosophy Southern Federal University, Rusia
- Miomira M. Đurđanović, University of Niš, Faculty of Arts, Niš, Serbia
- Muhamad Imaduddin, Institut Agama Islam Negeri Kudus, Indonesia
- Muhammad Khalique, Mirpur University of Science and Technology (MUST), Mirpur, Pakistan
- Murat Tezer, Near East University, Turkey
- Nikolay Tsankov, South-West University, Bulgaria
- Nur Hidayah, Malang State University. Indonesia
- Oksana Barsukova, Southern Federal University, Russia
- Olga Fedotova, Don State Technical University, Russia
- Rail Shamionov, Saratov State University, Russia
- Sabina Vidulin, Academy of Music in Pula, University of Juraj Dobrila in Pula, Croatia
- Sana Lashari, Universiti Utara Malaysia | UUM, Malaysia
- Siniša Opić, Faculty of Teacher Education, University of Zagreb, Croatia
- Sofiq Dermendjieva, South-West University, Bulgaria
- Sonja Veličković, College for Preschool Teachers, Aleksinac, Serbia
- Surya Faradiba, Universitas Islam Malang, Indonesia
- Svetlana Masalova, Institute of Improving Teachers' Qualification and Professional Retraining, Russia
- Tatiana Peredrienko, Federal State Autonomous Educational Institution of Higher Education "South Ural State University (national research university)", Russia
- Toni Maglica, Faculty of Humanities and Social Sciences, University of Split, Croatia
- Valentina Gulevska, Univerzitet „Sv. Kliment Ohridski" – Bitola, Pedagoški fakultet, Macedonia
- Valery Solovyev, Kazan Federal University, Russia
- Vlada Igorevna Pishchik, Don State Technical University (DSTU), Russia
- Vladimir Kosonogov, Southern Federal University, Russia
- Vladimir Radivojević, Regional Center of the Ministry of Defense Niš, Serbia
- Yulia Mochalova, Don State Technical University, Russia
- Yuliya Tushnova, Don State Technical University, Russia
- Zalik Nuryana, Universitas Ahmad Dahlan Yogyakarta Indonesia
- Zehra Ozcinar, Ataturk Teacher Training Academy, Turkey
- Zifa Temirgazina, Pavlodar State Pedagogical University, Kazakhstan
- Zoran Mastilo, University of East Sarajevo, Faculty of Business Economics Bijeljina, Republic of Srpska

AUTHORS` GUIDELINES

The journal publishes papers written by the members of the Association.

Annual membership fees:

- For residents (members of the Republic of Serbia) in the amount of 6.000,00 RSD
- For non-residents (members outside the Republic of Serbia) in the amount of 50 euros.

The journal do not charge authors an article processing charge (APC).

Types of contributions

Original Research, Review Articles, Studies and articles, Book Reviews, Case Studies and Monographic studies.

BEFORE YOU BEGIN

Authorship of the Paper

Authorship should be limited to those who have made a significant contribution to the conception, design, execution, or interpretation of the reported study. All those who have made significant contributions should be listed as co-authors. Where there are others who have participated in certain substantive aspects of the research project, they should be acknowledged or listed as contributors. The corresponding author should ensure that all appropriate co-authors and no inappropriate co-authors are included on the paper and that all co-authors have seen and approved the final version of the paper and have agreed to its submission for publication.

Authors of work

The author of the paper should be the person who made the greatest contribution to the creation of the work. All those who contributed to the making of the work should be listed in the paper and as co-authors. If there are other contributors who took part in the preparation of making the same work should be listed or admitted as associates.

Before accepting a final version of the paper for publication is necessary that the author and all co-authors approved the final version.

Changes in authorship

Privacy change in authorship relates to the addition, deletion, or rearrangement of author names in accepted version of the paper. An amendment to the data on the authors or co-authors is not possible after acceptance and publication in the online version.

If there is a need to amend the information on the authors, it is necessary to state the following:

1. The reason for the addition or deletion of author,
2. A written confirmation (send it scanned by e-mail) where all the authors agree that the notified operation is a named person is added or removed from the list of authors.
3. The editor will notify the author that needs to be added or removed from the list and will ask for his consent.

Requirements that are not sent by the respective author (corresponding author) will not be considered.

Originality and plagiarism

Authors are required to submit original written article. If other work necessary to work properly quote according to the instructions on the citation of work. If you use ideas of other authors require their written consent and using the same.

Plagiarism in all its forms constitutes unethical behavior and will be severely punished, and as such is unacceptable. The author or authors are required before reporting to work in the journal checking their work through some of the programs for testing against plagiarism. The Editorial Board reserves the right to verify each work through the test of plagiarism and if the same occurs to notify the author.

Disclosure and conflicts of interest

Disclosure and conflicts of interest can be multiple. If the author or institution where the author has a financial assistance in project design or research is needed to adequately cover letter to inform the editorial and the public. Publication in journal person or institution that is financially supported by the making of the work or project is the best way to protect against conflicts of interest.

At the end of the text, under a subheading '' Conflicts of interest '', all authors must disclose any actual or potential conflict of interest including any financial (direct of indirect), personal or other relationships with other people or organizations within three years from the commencement of any work.

Fundamental errors in published work

If the author detects an error in the published paper is obliged to instantly inform journal editors or publishers and that as soon as possible the same document. The author shall, in the event of an error, to cooperate with the editorial board to remove the same.

Copyright Notice

The Author(s) warrant that their manuscript is their original work that has not been published before; that it is not under consideration for publication elsewhere; and that its publication has been approved by all co-authors, if any, as well as tacitly or explicitly by the responsible authorities at the institution where the work was carried out. The Author(s) affirm that the article contains no unfounded or unlawful statements and does not violate the rights of others. If copyrighted works are included, the Author(s) bear responsibility to obtain written permission from the copyright owners. The Corresponding author, as the signing author, warrants that he/she has full power to make this grant on behalf of the Author(s).

By signing this agreement, the Corresponding author grants to the Publisher the following rights to the Manuscript, including any supplemental material, and any parts, extracts or elements thereof:

- the right to reproduce and distribute the Manuscript in printed form, including print-on-demand;
- the right to produce prepublications, reprints, and special editions of the Manuscript;
- the right to translate the Manuscript into other languages;
- the right to reproduce the Manuscript using photomechanical or similar means including, but not limited to photocopy, and the right to distribute these reproductions;
- the right to reproduce and distribute the Manuscript electronically or optically on any and all data carriers or storage media – especially in machine readable/digitalized form on data carriers such as hard drive, CD-Rom, DVD, Blu-ray Disc (BD), Mini-Disk, data tape – and the right to reproduce and distribute the Article via these data carriers;
- the right to store the Manuscript in databases, including online databases, and the right of transmission of the Manuscript in all technical systems and modes;
- the right to make the Manuscript available to the public or to closed user groups on individual demand, for use on monitors or other readers (including e-books), and in printable form for the user, either via the internet, other online services, or via internal or external networks.

Articles published in the Journal are Open-Access articles distributed under a Creative Commons Attribution-ShareAlike 4.0 International License.

The Journal allows Author(s) to deposit Author's Post-print (accepted version) and Publisher's version/PDF in an institutional repository and non-commercial subject-based repositories, such as PubMed Central, Europe PMC, arXiv and other repositories, or to publish it on Author's personal website and departmental website (including social networking sites, such as ResearchGate, Academia.edu, etc.), at any time after publication. Publisher copyright and source must be acknowledged and a link must be made to the article's DOI.

Upon receiving the proofs, the Author(s) agree to promptly check the proofs carefully, correct any typographical errors, and authorize the publication of the corrected proofs.

The Corresponding author agrees to inform his/her co-authors, of any of the above terms.

The journal allows readers to read, download, copy, distribute, print, search, or link to the full texts of its articles and allow readers to use them for any other lawful purpose.

Copyright Agreement

For open access articles, permitted third party (re)use is defined by the following Creative Commons user licenses:

Creative Commons Attribution (CC-BY)

Lets others distribute and copy the article, create extracts, abstracts, and other revised versions, adaptations or derivative works of or from an article (such as a translation), include in a collective work (such as an anthology), text or data mine the article, even for commercial purposes, as long as they credit the author(s), do not represent the author as endorsing their adaptation of the article, and do not modify the article in such a way as to damage the author's honor or reputation.

Creative Commons Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)

For non-commercial purposes, lets others distribute and copy the article, and to include in a collective work (such as an anthology), as long as they credit the author(s) and provided they do not alter or modify the article.

Language (usage and editing services)

Please write in good English (American or British usage is accepted, but not a mixture of these). For non-native English speakers, and perhaps even for some native English speakers, the grammar, spelling, usage, and punctuation of the text are very important for an effective presentation. Hence, manuscripts are expected to be written in a clear, cogent, and readily understandable by an international readership. To avoid unnecessary errors, you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the English Language Editing service available from EDANZ -

http://www.edanzediting.com/services/english_editing

Submission declaration and verification

Submit your article

Please submit your article via

http://ijcrsee.com/index.php/ijcrsee/about/submissions#onlineSubmissions

NEW SUBMISSIONS

Manuscripts must submit only online, proceeds are totally online and you will be guided stepwise through the creation and uploading of your files. Electronic submission reduces the editorial processing and reviewing times and reduces the time of submission to publication.

You have to use IJCRSEE template to prepare your article and this version upload via

http://ijcrsee.com/index.php/ijcrsee/about/submissions#onlineSubmissions

Formatting requirements

The prepared article should be formatted with IJCRSEE template. There are some parameters for authors.

If your article includes any Videos and/or other Supplementary material, this should be included in your initial submission for peer review purposes.

Divide the article into clearly defined sections.

Structure of Manuscripts

Title Page

The title page should include:

The name(s) of the author(s)

A concise and informative title

The affiliation(s) and address(es) of the author(s)
The e-mail address of the corresponding author.

Abstract

The abstract should contain a maximum of 250 words. The abstracts should avoid any abbreviations and mathematical formulas.

Keywords should include 4-6 keywords.

Text Formatting

Manuscripts should be submitted in Word, A4, Times New Roman, 10-point for abstract and keywords and 12-points for text.

A complete manuscript falls need to be maximum 8,000 words excluding references, tables, and figures. Depending on the research and work purposes, the editor decides the acceptance of a larger number of pages.

For numerations of pages use the automatic page numbering function.

In the text for emphasis use italics.

The use of abbreviations should be avoided. If using the first Abbreviations should be used throughout the text the same.

For headings use maximum three levels.

Footnotes should be avoided. If used, footnotes should only contain additional text (comment), and not information about sources used.

Acknowledgments should be placed in a separate section before the reference list.

Introduction – State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

Materials and Methods – Provide sufficient detail to allow the work to be reproduced. Methods already published should be indicated by a reference: only relevant modifications should be described.

Results – Results should be clear and concise.

Discussions – This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

Conclusions - The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

Appendices - If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

Acknowledgments - Collate acknowledgments in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proofreading the article, etc.).

Reference Style– All manuscripts should be formatted using the American Psychological Association (APA) citation style, which is used primarily in the social sciences. For additional examples, consult the most recent edition of the Publication Manual of the American Psychological Association. You are referred to the Publication Manual of the American Psychological Association, Sixth Edition, ISBN 978-1-4338-0561-5, copies of which may be ordered from http://books.apa.org/books.cfm?id=4200067 or APA Order Dept., P.O.B. 2710, Hyattsville, MD 20784, USA or APA, 3 Henrietta Street, London, WC3E 8LU, UK.

Use of DOI is highly encouraged.

CITING REFERENCES IN TEXT

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Citation of a reference as 'in press' implies that the item has been accepted for publication.

• If an one author is sufficient to cite only the year, but not the page if you do not quote the text directly, or do not mention the fact that needs to be linked to the page.

Busk (2014) compared reaction times ...

In a recent study of reaction times (Busk, 2014) ... (ibid, str.105).

When citing in plain text, the author's name and year of release of work separated by commas.

If we are in the plain text provide the name and year of the author, there is no need to give the same information again in parentheses.

In 2012 Stosic compared reaction times ... (ibid, page 102).

• When a work has two authors, always indicate both names and year and between surnames of the authors specify the conjunction &.

Nightlinger and Littlewood (2003) demonstrated ...

As has been shown (Busk & Serlin, 1993) ...

• When in plain text quoting the names of three, four or five authors, first make sure to include all the names, and text enough to write only the first and add '' and associates''.

First time: Yan, G., Tian, H., Bai, X. & Rayner, K. (2006). found ...

Second time: Yan, G.et al. (2006) found ... (ibid, p. 12)

• When a work has no author's name, whether it's because it is issued by the agency, organization, or governmental institutions, rather than the names of authors mention the name of the institution or organization that has signed the paper, and if a name is long, just so many words or abbreviation as needed to locate the source in the list of references.

First time: (National Institute of Mental Health [NIMH], 1999) ...

Second time: (NIMH, 1999) ...

• When you do not have the names of institutions or authors, when the work is anonymous, then mention only the first few words of the title, and we quote them in parentheses under the quotation marks in plain text in italics.

These result present (‘’ Study Finds, ‘’ 2002) ...

The book College Bound Seniors (2003) ...

When work in the header nominated as anonymous, then it in the text under the anonymous quote and cite year, in English (Anonymous, 2011).

• If there are two references to the same author's last name, then be sure to mention when citing the initials to avoid unnecessary search in a list of references.

JM Goldberg and Neff (1961) and ME Goldberg and Wurtz (1972) studied ...

• If the same author or the same authors cite two or more references, then in brackets do not repeat names but just add a year for the next release.

Past research (Edeline & Weinberger, 1991, 1993) ...

Past research (Gogel, 1984, 1990) ...

• When the same author we have more work during one year, then these sources labeled the letters of the alphabet a, b, c and so on.

Several studies (Gogel, 1984, 1990a, 1990b) ...

• When several authors cite in the same bracket, or when we point to the consent of the author, references detach semicolon and listed them in alphabetical order.

Several studies (Balda 1980, Kamil 1988, Pepperberg & Funk, 1990) ...

• If with some of the references cite a source that confirms what is specific to this reference, then the source listed below see also, but that goes with the source of reference, but not alphabetically.

Several studies (Minor 2001; see also Adams, 1999; Storandt, 1997) ...

• When quoting hearsay, cite the author's name and year of the original work, followed by a semicolon and then cited code, then last name, year and foreign labor from which he quoted original work.

The first definition of intrinsic motivation gave Decy (1975; see Suzić 2005, p. 108) ...

• If we know the year of the first publication of the work, then it is to be connected age translation by first listed year of first publication, a slash and then year translation.

(James, 1890/1983)

• For an Internet source that does not have a bookmarked Web page, use a pair of ¶ and paragraph number on the page where it was published.

(Myers, 2000, ¶ 5)

• Personal communication or publicly spoken words in a lecture to quote only in plain text, but not in the list of references, but does mention the date of actual communication.

Decy (personal communication, April 18, 2001) ...

REFERENCES

• Form Guidance papers in the journal is as follows:

The author's name [comma], initial / names [point], [open small brackets] year of publication [close little brackets] [point] title of the paper [point], the name of the magazine - in italics [comma] the number or volume - in italics [comma] page starting work [line] Page completing work [point].

Dennis, TA, Cole, PM, Wiggins, CN, Cohen, LH & Zalewsky, M. (2009). The functional organization of preschool-age children's emotion expressions and actions in challenging situations. *Emotion, 9,* 520-530.

• Form quoting the works of authors of books is as follows:

The author's name [comma], initial / names [point], [open small brackets] year of publication [close little brackets] [point] title deeds - in italics [point], the city (and state) [two counts], the publisher [Point].

Hirsch, Jr., E. D. (1996). *The schools we need and why we do not have them.* New York: Doubleday.

• When you mention a paper published in a journal or as part of a book as a chapter, then applies the following form:

The author's name [comma], initial / names [point], [open small brackets] year of publication [close little brackets] [point] title of the paper [point], In Proceedings ... (note that the work was published in a journal or book ...) The name of the publisher [open small brackets] Issue. (Note that this is a publisher) [Close little brackets] [comma] title of the collection - in italics [open small brackets] page starting work [line] Page completing work [point], the city (and state) [two counts], publisher [point].

Barrett, KC, & Campos, JJ (1987). Perspectives on emotional development: II. A functionalist approaches to emotions. In Osofsky JD (Ed.), *Handbook of Infant Development* (2nd ed., Pp. 555-578). Oxford, England: Wiley.

• If seven or more authors, then we will list the names of the six authors, and the seventh and the rest fall into the category of '' and associates ''.

Adam, JJ, Paas, F. Teeken, JC van Loon, EM, Van Boxtel, MPJ, Houx, PJ, et al. (1998). Effects of age on performance and a finger-precuing task. J*ournal of Experimental Psychology: Human Perception and Performance, 24,* pp. 870-883.

Second and last author in a list of references are always stating afterward conjunctions & English.

• In magazines published articles cite the following form:

the author's name [comma], initial / names [point], [open small brackets] day, month and year of publication [close little brackets] and the title [point], the name of the magazine or newspaper - italics [comma], number of journals or Newspapers - italics [comma], page beginning of the text [line] Page completing the text [point].

Henry, W. A., III. (1990, April 9). Beyond the Melting Pot. Time, 135, 28-31.

• When we need to with the title of the article mention what kind of material it is then enclosed in square brackets after the title of the paper is printed by it is a brochure, video recording and the like.

Research and Training Center on Independent Living. (1993). Guidelines for reporting and writing about people with disabilities (4th ed.) [Brochure]. Lawrence, KS: Author.

• The work of famous authors downloaded electronically applies the following form:

The author's name [comma], initial / names [point], [open small brackets] year of publication [close little brackets] [point] title of the paper [point], an indication of what kind of material is in square brackets, taken (note that work will take) the day, month and year, with (internet address).

Schwarzer, R. (1989). Statistics software for meta-analysis [Computer software and manual]. Retrieved March 23, 2001, http://www.yorku.ca/faculty/academic/schwarze/meta_e.htm

• When the list reference is made to the work that is being prepared for the press, after the authors' names, in parentheses, listed in the press in English.

Zuckerman, M. Kieffer, SC (in press). Race differences in faceism: Does facial prominence imply dominance? Journal of Personality and Social Psychology.

• When the list of references cites a newspaper article without the author prints the name of the article, then the time of publication, then the title and number - in italics, and at the end of the page on which the article was published. If the title is long, we can shorten the optimum number of words by taking the first few words.

The new health-care lexicon. (1983, August / September). Copy Editor, 4, 1-2.

• If within the journal as publisher publishes a special issue as a monograph, it is necessary after heading indicate that it is a monograph.

Ganster, DC, Schaubroeck, J. Sime, WE, & Myers, BT (1991). The nomological validity of the Type A personality among employed adults [Monograph]. *Journal of Applied Psychology, 76,* 143-168.

• When an abstract or summary of the quote as the original source, after the title should be in parentheses to indicate that it is abstract.

Woolf, NJ, Young, SL, Famselow, MS, & Butcher, LL (1991). Map-2 expression in cholinoceptive pyramidal cells of rodent cortex and hippocampus is altered by Pavlovian conditioning [Abstract]. *Society for Neuroscience Abstracts, 17*, 480 harvesters.

• Titles that are not in English, and we want them to be published in the journal in English, listed in their native language, and then in the square brackets give the title translation into English. In addition to the title, everything else remains the mother tongue.

Ising, M. (2000). Intensitätsabhängigkeit evozierter Potenzial their EEG: Sindh impulsive persons Augmenter stage Reducer? [Intensuty dependence and event related EEG potentials: Are impulsive individuals augmenters or reducers?]. *Zeitschrift für Différentiel und diagnostisch Psychology, 21,* 208-217.

• In the list of literature translated work following a text that we have a year of the original edition listed in parentheses at the end behind the publisher. When we quote in plain text, year of first publication and translation writing along with a slash between (eg. Laplace, 1814/1951).

Laplace, P. S. (1951). A philosophical essay on probabilities (FW Troscott & FL Emory, Trans.). New York: Dover. (Original work published 1814)

• When the list of references cites a paper published in the Proceedings of the translated, italics will print the name of the collection at the end to add when it published the original.

Freud, S. (1961). The ego and the id. In J. Strachey (Ed. & Trans.), The standard edition of the complete psychological works of Sigmund Freud (Vol. 19, pp. 3-66). London: Hogarth Press. (Original work published 1923).

• When you cite articles published on the university or one of the official institutions, universities, publishers listed as the first name of the university and then university.

Broadhurst, RG, & Maller, RA (1991). Sex offending and recidivism (Tech. Rep. No. 3). Nedlands: University of Western Australia, Crime Research Center.

• When the list of sources cites a report of an organization or institution that has no author, it is best to nominate as the author of this organization, which is also the publisher.

Employee Benefit Research Institute. (1992, February). Sources of health insurance and characteristics of the uninsured (Issue Brief No. 123). Washington, DC: Author.

• When the work was published on the Internet as a photocopy, it should cite the original source noting that this is the electronic version.

Vandenbos, G. Knapp, S., & Doe, J. (2001). The role of reference elements in the selection of resources by psychology undergraduates [Electronic version]. *Journal of Bibliographic Research, 5*, 117-123.

• If you download from the Internet work that you believe is different from the original, do not copy or no numbered pages, then at the end indicate the date of downloads and web address.

Vandenbos, G. Knapp, S., & Doe, J. (2001). The role of reference elements in the selection of resources by psychology undergraduates [Electronic version]. *Journal of Bibliographic Research, 5,* 117-123. Retrieved October 13, 2001, from http://jbr.org/articles.html

• When you download from the Internet a document which has no date or author, then the document name takes the place of the author or the first place.

8th GVU's WWW User Survey. (Od). Retrieved August 8, 2000, from http://www.cc.gatech.edu/gvu/user_surveys/survey-1997-10/

• Material from the symposium or a scientific paper which was only exposed, but not published, listed with the note on which the scientific or professional meeting is material exposed. If the author has presented on the site, it is desirable to name and web page.

Cuter, LD, Frölich, B., & Hanrahan, P. (1997, January 16). Twohanded direct manipulation on the responsive workbench. Paper presented at the 1997 Symposium on Interactive 3D Graphics. Abstract retrieved June 12, 2000, from http://www.graphics.standard.edu/papers/twohanded/

• Computer software listed noting computer software. Name of the software we write italics.

Miller, M. E. (1993). The Interactive Tester (Version 4.0) [Computer software]. Weastminster, CA: Psytek Sesvice.

• Data downloaded from the website of the government or other official organization listed noting data file. The filename of the data listed in italics.

Department of Health and Human Services, National Center for Health Statistics. (1991). National Health Provider Inventory: Home health agencies and hospices, 1991. [Data file]. Available from the National Technical Information Service Web site, http://www.ntis.gov

Standards take according to Suzic, N. (2010). *Pravila pisanja naučnog rada APA i drugi standardi* [Rules scientific APA work and other standards]. XBS Banja Luka.

Reference management software

The journal has a standard template – IJCRSEE template. To cite reference, it is the easiest way to use some management software like:

Mendeley (http://www.mendeley.com/features/reference-manager)
EndNote (http://www.endnote.com/support/enstyles.asp) and
Reference Manager (http://refman.com/support/rmstyles.asp).

Above management software have plug-ins to word processing where authors only need to select the appropriate journal template when preparing their article and the list of references and citations to these will be formatted according to the journal style as described in this Guide. If you cannot find an available template, see the list of sample references and citations provided in this Guide to help you format these according to the journal style.

After acceptance

Online proof correction

Corresponding authors will receive an e-mail with a link to our online proofing system, where have to make prof own article. The final version is created in PDF and authors have to accept final version or to immediately report the error. We will do everything possible to get your article published quickly and accurately. Please check carefully before replying, as the inclusion of any subsequent corrections cannot be guaranteed. Proofreading is solely your responsibility.

https://pubpeer.com/Check the comments on published and withdrawn works.

All the articles in this journal have been peer reviewed. Nonetheless, editors and organizers are not responsible for the content shown in this publication.

Submission Preparation Checklist

As part of the submission process, authors are required to check off their submission's compliance with all of the following items, and submissions may be returned to authors that do not adhere to these guidelines.

The submission has not been previously published, nor is it before another journal for consideration (or an explanation has been provided in Comments to the Editor).

The submission file is in OpenOffice, Microsoft Word, RTF, or WordPerfect document file format.

Where available, URLs for the references have been provided.

The text is single-spaced; uses a 12-point font; employs italics, rather than underlining (except with URL addresses); and all illustrations, figures, and tables are placed within the text at the appropriate points, rather than at the end.

The text adheres to the stylistic and bibliographic requirements outlined in the Author Guidelines, which is found in About the Journal.

If submitting to a peer-reviewed section of the journal, the instructions in Ensuring a Blind Review have been followed.

Have checked paper for possible accidental plagiarism. Some plagiarism checker websites includes: www.grammarly.com,www.plagtracker.com, http://www.ithenticate.com/ or www.duplichecker.com

To verify originality, your article may be checked by the originality detection service CrossCheck.

PARTNERS AND SPONSORS

Don State Technical University - DSTU, Rostov on Don, Russia
https://donstu.ru/

Southern Federal University (Russia, Rostov-on-Don)
Academy of Psychology and Pedagogy
Rostov Institute of Further Training and Retraining of Educators (Russia, Rostov-on-Don)
http://sfedu.ru/

Moscow State University of Psychology and education
faculty of legal and forensic psychology
http://jp.mgppu.ru/en

The Faculty of Philosophy of Skopje, University St. Cyril and Methodius, Macedonia
http://fzf.ukim.edu.mk/index.php/en/

University “St. Kliment Ohridski”, Faculty of Education in Bitola, Macedonia
http://www.pfbt.uklo.edu.mk/

Polskie Towarzystwo Psychologii Klinicznej

Polish Society of Clinical Psychology

http://ptpk.org.pl/

PsyJournals.ru
russian psychological issues

Psychology and Law
http://psyjournals.ru/en/psyandlaw/

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

37

INTERNATIONAL Journal of Cognitive Research in Science, Engineering and Education / editor in chief Lazar Stošić. - Vol. 1, iss. 1 (June 2013)- . - Vranje : The Association for the Development of Science, Engineering and Education, 2013- (Vranje : Aurora). - 30 cm

Tri puta godišnje. - Drugo izdanje na drugom medijumu: International Journal of Cognitive Research in Science, Engineering and Education (Online) = ISSN 2334-8496
ISSN 2334-847X = International Journal of Cognitive Research in Science, Engineering and Education
COBISS.SR-ID 199383052