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Innovative thinking: determining the type of innovative thinking of future pedagogues-psychologists

Abstract. *The article discusses the differences between types of innovative thinking and the fact that innovative thinking is one of the most important aspects for future pedagogues-psychologists. The development of high technologies and innovations, which are an integral part of the economy of any state, is one of the most pressing issues for future specialists, especially for pedagogues and psychologists in order to keep up with the current trends.*

The main goal of this research – to define the type of innovative thinking of future specialists in the context of the modern education. Also, we tried to analyze the concept «innovation» and some notions which connected with this concept and there are some information about innovative thinking and its types. Considering the four stages of innovative thinking and analyze the main characteristics of them.

The research was based on Kirton's questionnaire in order to determine the type of innovative thinking of future pedagogues-psychologists. As a result of the research, innovative forms of thinking of future pedagogues-psychologists were identified and differentiated.

Keywords: *innovative thinking, types of innovative thinking, innovative personal, adaptive-innovative cognitive style, adaptor, innovator, pedagogue-innovator.*

DOI: <https://doi.org/10.32523/2616-6895-2022-138-1-549-557>

Introduction

In the context of global changes, innovative changes have a special place. The development of modern innovative technologies, as well as their commercialization, is becoming an integral part of the economy. It is clear that the acceleration of the transition of the economy and industry to innovative development will be one of the most important factors in the success of the large number of specialists who are inclined to work with innovative ideas in many areas. Innovate thinking is one of the most important 21st-century competencies which allows to increase in all parts of the society. Therefore, the formation of

a positive attitude to innovation and orientation to innovative thinking for future pedagogues-psychologists is an urgent requirement of modern society.

The main part

Curiosity and necessity in the area of innovation had grown in last years, guiding to the introduction of a different explanations of this concept by various branches of science.

The terms «innovation», «innovative thinking», «innovative activity», «innovative personality» have become increasingly common in information sources in recent periods.

The word «Innovation» comes from the Latin. Innovation – a noun from the verb «innovari» with the meaning «to change or change to modernize». Thus, the central importance of innovation is as far as renewal is concerned. Such an update is possible only if people can change the way they make decisions using standard methods, learn to make choices outside the existing framework of norms and rules. [1, p.8].

Innovative activity is one of the aspects of the order of development of the modern school. Innovative activity involves measures to deviate from the limits of a certain standard and introduce an alternative system from other areas of education created by the socio-economic situation [2, p.78].

Therefore, innovative activity is characterized by such processes as the invention, analysis, development, and implementation of innovations in the workplace.

Innovative pedagogical activity contradicts the stereotype of certain teaching, education and development, which is aimed at the formation of a teacher who is able to go beyond certain limits and work independently, in their own direction [3, p.114].

Innovative thinking is defined as the ability of a person to carry out innovative activities. But this ability includes not only mental operations, but also personal qualities, such as initiative, critical thinking, propensity for reflection, innovation and motivation, etc.

Innovative thinking, a concept that determines the direction of new thinking. The problem is not only in the news, but also in its direction. Novelty is a concept that determines the direction of movement. Whatever has moved forward, that is, the movement that has moved forward – is novelty. It has three dimensions: a new thought (idea), a new action, and a new result [4].

According to the definition proposed by V.P. Delia, it is the thinking of an individual who is able to create and reproduce mental models with physiological systems, socio-cultural patterns, including innovations and innovation processes aimed at improving the modern picture of the world independently and impulsively with

objectivity, in terms of spirituality, goodness and reality [5, p.232].

A number of researchers have suggested that the concept of «innovative thinking» is the improvement of the image of the world, that is, «innovative thinking» which is a type of thinking aimed at solving practical problems that change the world around us [6, p.20].

The concept of «innovative personality» as a necessary prerequisite for increasing economic growth, the spread of entrepreneurship, and capital accumulation was first used in 1962 by the American researcher Everett Hagen [7, p.21].

The «innovative person» is adaptable to changes in everything: in his life, in economic development, in the development of science and technology. He is an active initiator and producer of these changes, considering sustainable development as an integral part of his life principles [8, p.127], that is, an innovative person, open, creative, tolerant, a generator of innovative thoughts and ideas, and shows the desire for positive changes.

The explanations to the concept of innovative thinking are rare, while this concept is widely consumed. In our work we pay more attention to the following definitions, some of them are used in the sphere of education.

The first one is introduced in the field of education, which describes that: “Innovative thinking is an opportunity of causing new, modern ideas about what should be done in order to wake children’s interests in their studies” [9, p.1]. This given definition shortages the realization step of the action but it is the heart of generation of new thoughts or ideas.

The next one is common: “The concept of innovative thinking is the thinking capacity upon the innovate process” [10, p.52], which means that this type of thinking is the informative process which consists of new or greatly elaborated ideas. The mentioned definition is considered as general and doesn’t describe the branches of innovation which the other parts of innovative thinking might be received.

The last explanation connected with the sphere of science: “This is a thinking method

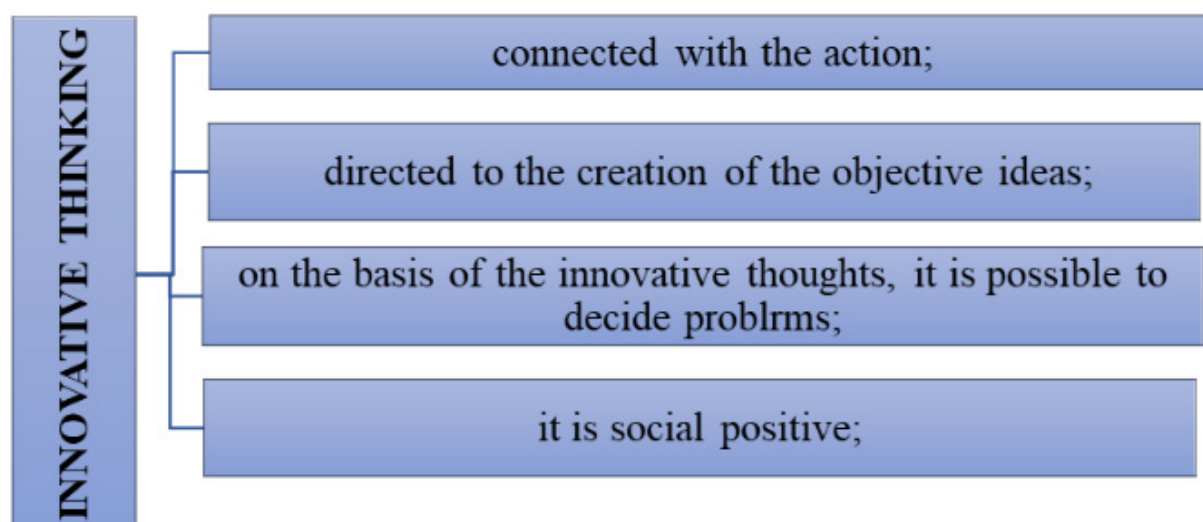


Figure 1 – Description of the innovative thinking

of finding fresh ideas, creating modern ways, and deciding new difficulties on the found of individual practices” [11, p.10]. The current definition characterizes innovative thinking as an operation, which is more particular than the previous ones, although it is not enough exact, while new items like “discovering”, “solving the difficulties” and “creating” are related to the notion of innovation.

Currently, the activity of forming a new generation of clusters – an innovative cluster-is actively developing in the developed countries of the front line. The most important aspects of development are not industrial enterprises, but centers of innovation and knowledge – universities, technological and engineering organizations. This creates a «three-character spiral» based on the interaction of business, universities and the state [4].

Therefore, if the formation of innovative thinking processes of future pedagogues-psychologists is carried out as early as possible and received trilateral support, then the contribution of modern innovative pedagogues-psychologists to the future, the development of the country, and the education of the younger generation will be enormous.

The need to create such clusters in our country was mentioned in the messages published in 2013.

After reviewing these definitions, came to the conclusion that innovative thinking is a type of thinking that is not formed immediately or independently, usually it is created in a favorable environment that stimulates the process of thinking for a long time.

There are several types of thinking: empirical, theoretical, visual-figurative, logical, spatial, and so on.

In addition, the whole process of thinking and the above types of thinking highlight individual features of thinking. For example, theoretical thinking reveals generalized relationships, studies the form of cognition in its own system of necessary connections, as a result - the laws of development of various phenomena that provide human creative activity are clearly defined, and empirical thinking allows the first generalization on the basis of daily activities. Such generalizations are performed at the lowest level of abstraction.

Based on the definition proposed by V.P. Delia, the following characteristics are proposed for innovative thinking.

According to A.P. Usoltsev and T.N. Shamalo, innovative thinking is a type of thinking aimed at providing innovative activity at the cognitive and instrumental level, aimed at creative, scientific-theoretical, socio-positive, constructive, transformative, pragmatic thinking [6].

It is obvious that innovation and innovative activity contribute to the formation of innovative thinking. Sh.T.Taubaeva noted that innovative thinking consists of interrelated stages [12, p.6].

Table 1. Stages of innovative thinking

Cognitive	the process of emergence of innovation in the subjective reality of the pedagogue, which takes place in the system of thinking through the recognition of the content of new knowledge and the generation of innovation;
Planning	interdisciplinary, the cognition of subject on the found of integrative approach, at the beginning, different philosophical constructions, cognitive theory, psychology, pedagogy;
Instrumental	the stage of creation of technological innovations in practice by the pedagogue-innovator;
Corrective	in order to improve the pedagogical practice of pedagogue-innovator;

The relations between the theories of learning and innovative thinking

According to Dyer the competencies of innovative thinking might be mentioned in three learning theories that considers: cognitive learning, experiential learning and socio-cultural theory [13, p.317].

The cognitive learning theories which investigated the cognitive processes like mastering new material into available knowledge and collecting the essential editings to the formed intellectual structure to adapt the fresh information.

The main items of discovering are observing and questioning. Meanwhile observing considers the act of exploring the discovery with interests, defining the difficulties and searching the reply for it. It facilitates to the learning process by giving a chance to construct and check the hypotheses and theories [14, p.815]. One of the most important higher-order cognitive competencies is a questioning, which describes

the act of clarifying what is needed in order to be educated [15, p.237].

The next learning theory is an experiential theory. It is the one branch of the cognitive learning theories. According to Kolb, its goal is to improve adult's holistic and multilinear model of development. The author mentioned that experimenting is the process of using constructive ideas to form a modern and remarkable issue.

As maintained by Vygotsky the last, socio-cultural theory concerns to the process of knowledge formation that happens during interacting with the surrounding world. Mainly, the theory analyzes how the mental functioning of the person is connected to cultural contexts and social interactions.

Also, as mentioned the group of authors like Vezzali, Gocłowska, Crisp cultural diversity enlarges creativity. In this way, sociocultural learning connects to social and cultural context, that has promotions for the competency of idea networking [16, p.152].

The mentioned four innovative thinking competencies are connected with each other. These processes due to Dyer and other researchers, gives us more confidence in using this as a tool to examine innovative thinking competencies in the sphere of education within future pedagogues-psychologists

Research materials and methods

Innovators are those who create changes or create an innovative climate in the economy and education as a whole, that is, they demonstrate the need to evaluate their ability and readiness to present and implement completely new ideas.

Due to differences in the cognitive sphere of people, such abilities are revealed in the most complete and detailed way in the works of the English psychologist M. Kirton.

The author explains the formation of attitudes towards new ideas, new technologies and suggestions through the concept of cognitive style.

According to M. Kirton's theory, every person has his own style of cognitive activity, which influences the attitude to the analysis

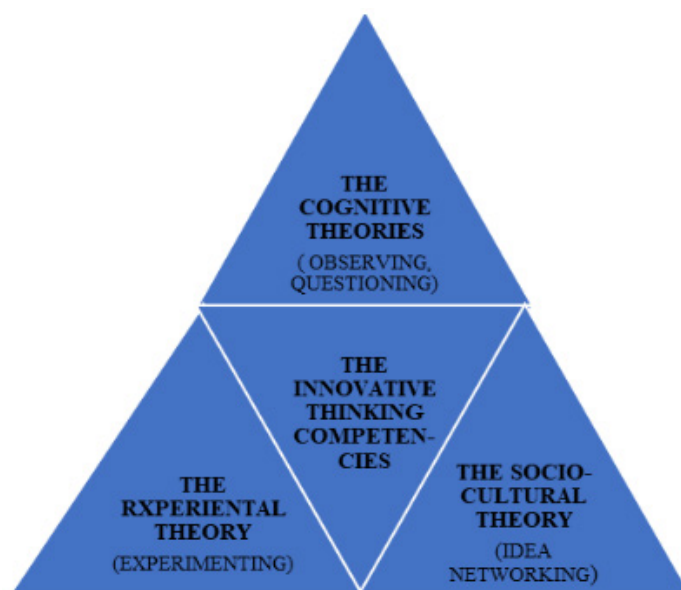


Figure 2 - Relations between the innovative thinking competencies and learning theories

of information, consideration of the problem, decision-making.

Adaptive-innovative cognitive style is a bipolar structure that helps each person find an effective way to solve problems. M. Kirton's theory allows us to determine how adaptors and innovators communicate with each other in the process of change at different levels of organizational development, as well as how they function correctly in different cultures.

For this purpose, a survey of first-year students of the L.N. Gumilyov Eurasian National University and Taraz Regional University named after M.Kh. Dulati, majoring in «Pedagogy and Psychology» was conducted on a five-point scale, consisting of 32 questions that identify innovative forms of thinking.

Research results

The results of the study with 30 students ranged from 68 to 132.

As a result, some first-year students majoring in «Pedagogy and Psychology» (34%) are innovators.

This means that they want to change their working conditions more often, and although their vision is to reevaluate and redefine problems and situations, innovators always tend to leave their business unfinished.

As for the next level, it turns out that the vast majority of students are adaptors (60%), that is, they prefer to work in a stable and comfortable atmosphere. At the same time, they want to improve the methods and practices they use, implement tasks in the course of their work without making too many changes to the previous rules.

Next, if we look at a special group called superinnovators and superadaptors, whose thinking style can undergo very frequent changes. The indicator in our study is the same 3% in both groups.

Table 2. Types of innovative thinking

Level	Number of respondents	% percentage
Innovator	10	34%
Superinnovator	1	3%
Adaptor	18	60%
Superadaptor	1	3%

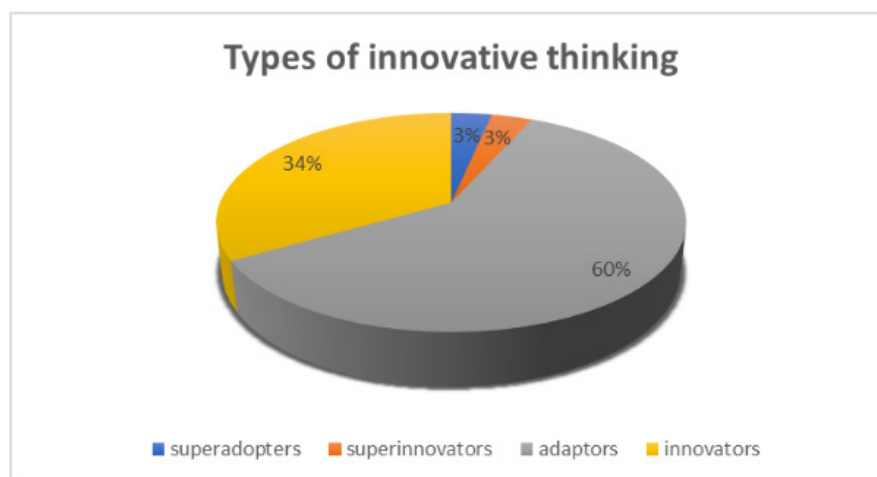


Figure 3 - Types of innovative thinking and its percentage

Conclusion

In conclusion, our aim was to define some explanations to the concept of “innovative thinking” which are based on information of a research papers and literatures.

Innovative thinking is one of the most important competencies set by today’s employers.

Innovative thinking is the key to the success of future pedagogues-psychologists. If the creative product of success is an idea, then the product of innovative thinking is the ability to effectively apply this idea in real conditions, that is, the importance of the formation of innovative thinking is increasing not only among employees

working in the field of innovation, but also among employees working in areas that are not directly related to the creation of innovations, including pedagogues-psychologists.

However, the process of formation of innovative specialists can create not only positive, but also negative socio-cultural problems for society.

An increase in the number of people with deviant behavior, an increase in the number of dangerous forms of behavior implemented not only in economic, but also in other areas of public life mean an increase in uncertainty, a decrease in the rational component of decision-making. All this, in turn, can negatively affect not

Table 3. Description of superinnovator and superadaptor

Superadaptor	Superinnovator
exact, reliable, reasonable;	Looks like as an undisciplined person, thinks extraordinary;
Solves problems only with checked and safe way;	Considers the basic rules, including the generally accepted rules with doubts;
Solves the problems by using the effective methods;	Solves the problems by determining again or by changing the conditions;
Can hold the stability in the group and rarely come to quarrels;	Often break the rules;
Offers safe ideas;	Often gives dangerous ideas;
Offers affordable decisions to all;	Offers solutions that most people don't like or don't accept [17,p.10];

only the state of society as a whole, but also the development of an innovative economy.

Although, in this article we try to present some tools which might be used in order to measure innovative abilities of future pedagogues-

psychologists according to the theories of learning.

The works of previous researches and their tools are like an enlightenment in what we must follow and improve.

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Инновациялық ойлау: болашақ педагог-психологтердің инновациялық ойлау түрін анықтау

Аңдатпа. Мақала инновациялық ойлаудың болашақ педагог-психологтер үшін маңызды аспектердің бірі болып табылатындығы және инновациялық ойлау түрлерінің арасындағы айырмашылықтар жөнінде. Жоғары технологиялардың дамуы мен кез-келген мемлекеттің экономикасының айнымас бір бөлігі болып табылатындықтан, болашақ мамандар үшін, әсіресе, педагог-психологтерді міндеті өте өзекті мәселе.

Жүргізген зерттеудің мақсаты – болашақ педагог-психологтердің қазіргі білім алу жағдайындағы инновациялық ойлаудың қай түріне жататынын анықтау болды. «Инновация» және осы ұғымға қатысты бірнеше түсініктер талданды, сондай-ақ инновациялық ойлау мен оның түрлері жөнінде кеңірек ақпа-

рат берілді. Инновациялық ойлаудың төрт кезеңдері қарастырылады және негізгі сипаттамаларына шолу жасалынды.

Зерттеу Киртонның инновациялық ойлау типін (Kirton Adaption-Innovation Inventory) анықтауға арналған сауалнамасы негізінде жүргізілді. Зерттеу нәтижесінде, болашақ педагог-психологтердің инновациялық ойлау түрлері анықталып, сараланды.

Түйін сөздер: инновациялық ойлау, инновациялық ойлау түрлері, инновациялық тұлға, адаптивті-инновациялық танымдық стиль, адаптор, инноватор, педагог-инноватор.

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Инновационное мышление: определение типов инновационного мышления будущих педагогов-психологов

Аннотация. В статье показано, что инновационное мышление является одним из важнейших аспектов для будущих педагогов-психологов, указаны различия между видами инновационного мышления. Развитие высоких технологий и инноваций, которые являются неотъемлемой частью экономики любого государства, является одним из самых актуальных вопросов для будущих специалистов, особенно для педагогов и психологов, чтобы идти в ногу с современными тенденциями.

Основная цель данного исследования – определить тип инновационного мышления будущих специалистов в контексте современного образования. Проанализированы несколько понятий, относящихся к термину «инновация», а также дана более широкая информация об инновационном мышлении и его видах. Рассмотрены четыре стадии инновационного мышления и проведен обзор основных характеристик.

Исследование проводилось на основе опроса Киртона, посвященного определению типа инновационного мышления (Kirton Adaption-Innovation Inventory). В результате исследования выявлены и проанализированы виды инновационного мышления будущих педагогов-психологов.

Ключевые слова: инновационное мышление, виды инновационных мышлений, инновационная личность, адаптивно-инновационный когнитивный стиль, адаптор, инноватор, педагог-инноватор.

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