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The Use of Memberwise Disjunction Mechanism to Select Teaching Methods Depending on Student Personality Type

Abstract. The problem of teaching methods classification doesn't lose its importance nowadays, because it gives the opportunity to analyze each method potential and to identify ways for its improvement, further development and implementation. A large number of approaches to teaching methods classification exists due to the complexity of the study object and seriousness of the tasks set by society before the modern professional school. The use of the memberwise disjunction mechanism in training methods classification which allows to take to the account wider range of different teaching methods symptoms is proposed. Visualization of the proposed classification with the help of graphs preserves the informational content of the multivariate data in a convenient, human-readable form, simplifies the perception of such classification and focuses attention on its features. Depending on the objectives of effective learning provision, it is possible to change the dominant criteria, and accordingly choose an effective, in this case, teaching methods. In the given example, a logical connection between teaching methods and students' types of consciousness and thinking is shown.

Keywords: teaching methods classification, memberwise disjunctions mechanism, graphs, visualization, thinking structure, consciousness types

1. Introduction

The problem of teaching methods was studied by number of eminent scientists both in Ukraine and abroad. In particular, states that "there is still no more impor-

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tant category for the development of educational theory and educational practice than the category of “teaching method” in pedagogy”. The method describes the activity from the standpoint of the process, the method – procedural activity characteristics. But not every process is method. Method acting normative activity process model, determines the most efficient and optimal way in solving relevant problems” [Slsatenin et al. 2002: 270].

The teaching method – extremely complex and polysemantic concept. “One cannot achieve the goal, realize the planned content, fill the teaching with cognitive activity without methods. Method – is a core of educational process, connecting link between the designed purpose and end result. Its role in “goal – content – methods – forms – learning tool” is crucial [Podlasyj 2003: 470].

The choice of teaching method to the appropriate method of students’ thinking will increase the educational process efficiency.

2. Research and publications analysis on teaching methods classification

Scientists have not yet come to a common understanding of the term “method”, naturally, there is no single classification. Due to the complexity and seriousness of the research object tasks assigned by society to modern vocational school a large number of approaches to teaching methods classification exists. Therefore, assessing all approaches to the teaching methods classification in general, it should be noted, that quest offers many didactists and trainers to use in training information methods and along with them use other as well, enabling “loosen the soil” of the human mind, today can be considered correct and necessary. These searches are aimed to stimulate the functionality of passive knowledge, turning them into active and to facilitate the assimilation of new knowledge and their application in practice.¹

Works of native didactists Alexander Alexuk [1981] and Vladimir Onishchuk [1987] are still popular now. They consider different approaches to teaching methods classifications, chronologically analyze their development.

Yurij Babanskiy [1985] proposed a universal classification, designed for all learning situations. Its methodological basis – is a holistic action approach. It incorporates the classifications, taking into account the motivation, sources of knowledge, learning form, learning logic, control and self-control. Altogether, this is the most constructive classification, but it needs to be improved because it does not include system-structural methods, that ignores the logical structure of educational material and doesn’t show main groups of methods subordination. In

¹ *Metody obuchenia*, <http://vaniorolap.narod.ru/theme11.html> [access: 15.12.2016].

advanced classification four groups of methods are included, composed according to their generalization, depending on the target functionality of each group. The largest group is the methods of teaching and learning activities organization.

Vladimir Sydorenko [2006: 21] offers his approach to building training methods (and tools) classification. It is based on content and form categories ratio. Sydorenko proposed classification scheme, which can be considered as a basis for teaching methods normative system, specific nomenclature which is used for building and implementing organizational learning forms according to his purpose. This author gives a summary of qualitative characteristics (nature, system, ways to improve) teaching methods, which complements and refines existing notions of this fundamental didactic concepts.

There are other classifications of teaching methods – Ivana Pidlasoho [2003], Mihaila Makhmutova [1986] (teaching methods and learning methods), Viktoria Kunicina [2001] (which combine two forms of logical methods – analysis and synthesis, analysis and induction, synthesis and induction, synthesis and deduction), Olga Zheleznyakova [2006: 46-54] (an innovative approach to the classification and the choice of teaching methods) and others.

Currently there is no single methods essence interpretation as educational category. Translated from the Greek “*methodos*” means “the way of research, theory,” a way to achieve a goal or perform a specific task. Etymologically, it is associated with a value that the methodology or the method of investigation has, the search for truth. But often it is associated with the method of presentation that basically changes and simplifies the content of any training that leads to a misunderstanding of the things essence. In pedagogy the disclosure of teaching methods and their classification is still controversial.

The article offers a new way of teaching methods classifying with the use of term by term disjunction. This new approach will allow the classification to consider a wider range of different teaching methods features, for example, choose an effective method depending on the consciousness type and student thinking structure. It is possible to select individually for each student the most effective teaching method not only in Higher Education but in farther sustainable education during his life as well.

3. The use of memberwise disjunctions mechanism for teaching methods classification

Systematization of major known teaching methods is given in Table. 1. Methods systematization contains different set of characteristics that describe their respective categories and are called subjects. Subjects define characteristics weight and

Table 1. Main Teaching Methods Characteristics

No.	Method	Content	Student activity	Student mental activity level	Knowledge level	For the level of inclusion into creative activity	For the domain mode of content transmission	Student activity level
1.	<i>l1</i> Lecture, briefing	Forming a learning circle	Passively acquire knowledge	r1 Recognition	Acquaintance	u1 Information receptive	Auditory	Passive
2.	<i>l2</i> Work with a book						Visual	Passive
3.	<i>l3</i> Conversation, dialogue, discussion	Knowledge synchronization between the parties	Actively acquire knowledge	r2 Reproduction	Copying	u3 Problem exposition	Auditory	Semi-active
4.	<i>l4</i> Training	Given knowledge snap to proper use	Develop practical skills	r3 Usage	Skills		u2 Reproductive	Kinesthetic
5.	<i>l5</i> Educational, business, didactical games					Kinesthetic		Active
6.	<i>l6</i> Algorithmic presentation of task					Kinesthetic	Semi-active	
7.	<i>l7</i> Practical laboratory work							
8.	<i>l8</i> Method of control questions							Auditory
9.	<i>l9</i> Situation modelling	Specification of acquired knowledge in relevant situations	Ability to use skills in specific situations	r4 Creativity	Expanding ability Supplement	u4 Heuristic	Auditory	Active
10.	<i>l10</i> Heuristic search, brainstorming, round table	Given knowledge snap to untypical situations, their interpretation	Actively summarize and transform acquired knowledge		Transformation		u5 Researching	Auditory
11.	<i>l11</i> Design and survey work					Kinesthetic		Active

Source: own elaboration.

can be placed in a linear row by ascending or descending characteristics weight values. Teaching methods classification is usually made intuitively, the sequence of it is a number of systematization mistakes and descending characteristic weight values selection. That is why it is reasonable to fulfill strict and clear classification algorithm based on mathematical conception.

Memberwise disjunctions method will be used for this purpose. The essence of this method lies in the systematized element selection, which have common features and qualities, is regrouped according to the selected criteria on certain algorithm. As the result certain elements structure is created. Assigning new criterion, we will get another structure, which shows element interdependence regarding this criterion.

We write the "Signs set" as $R = \{ri\}$, which has 4 items – signs set value, i.e. $i = 1, \dots, 3, 4$, where $r1 =$ recognition; $r2 =$ reproduction; $r3 =$ usage; $r4 =$ creativity. The set "Signs" $U = \{ui\}$ has 5 items – signs value, i.e. $i = 1, \dots, 5$, where $u1 =$ information receptive level; $u2 =$ reproductive level; $u3 =$ problem exposition level; $u4 =$ heuristic level; $u5 =$ research level. Set "Signs characteristics" $L = \{l\}$ has 11 pieces – signs values, that is $i = 1, \dots, 11$, where $l1 =$ lecture, briefing; $l2 =$ work with a book; $l3 =$ conversation, dialogue, discussion; $l4 =$ training; $l5 =$ educational, business, didactical games, $l6 =$ algorithmic presentation of task accomplishment; $l7 =$ practical laboratory work; $l8 =$ method of control questions; $l9 =$ situation modelling; $l10 =$ heuristic search, brainstorming, round table; $l11 =$ design and survey work. Introduce outlined set $Q = \{qi\}$ signs areas $qi, i = 1, \dots, 11$, that is:

$$Q = \{qi\}, i = 1, \dots, 11.$$

We can build a paradigmatic table that reflects the relationship between the signs localization area qi and subject variables l, u, r (Table. 2).

Table 2. Relationship between Signs Localization Area qi and Subject Variables l, u, r

Signs set	Signs	Signs characteristics	Signs localization area
$r1$	$u1$	$l1$	$q1 = r1u1l1$
$r1$	$u1$	$l2$	$q2 = r1u1l2$
$r2$	$u3$	$l3$	$q3 = r2u3l3$
$r3$	$u2$	$l6$	$q4 = r3u2l6$
$r3$	$u2$	$l7$	$q5 = r3u2l7$
$r3$	$u2$	$l8$	$q6 = r3u2l8$
$r3$	$u3$	$l4$	$q7 = r3u3l4$
$r3$	$u3$	$l5$	$q8 = r3u3l5$
$r3$	$u4$	$l9$	$q9 = r3u4l9$
$r4$	$u4$	$l10$	$q10 = r4u4l10$
$r4$	$u5$	$l11$	$q11 = r4u5l11$

The description of the meaning is needed. For example, signs localization area $q1 = r1u1l1$ = recognition information receptive level lecture, briefing: level of student's mental activity as recognition refers to information receptive level of creative activities can be implemented by instruction or lectures methods. $q11 = r2u3l3$ = reproduction level of problem presentation conversation, dialogue, discussion: the level of student's mental activity as reproduction refers to the problem presentation of creative activity and can be implemented in conversation, dialogue, discussion.

Signs localization area q is expressed through the value of subject variables r, l, u as follows:

$$r1u1l1 = q1; r1u1l2 = q2; r2u3l3 = q3; r3u2l6 = q4; r3u2l7 = q5; r3u2l8 = q6; r3u3l4 = q7; r1u3l5 = q8; r3u4l9 = q9; r4u4l10 = q10; r4u5l11 = q11.$$

Performs term by term disjunction the greatest possible number of related equations [Zinko 2015]. Introduction of term by term disjunction using a related equity due to the need to obtain local areas characteristics. Such areas may include more than one calculated limited number of signs and domains of research.

$$r1u1(l1 \vee l1) = q1 \vee q2; r2u3l3 = q3; r3u2(l6 \vee l7 \vee l8) = q4 \vee q5 \vee q6; r3u3(l4 \vee l5) = q7 \vee q8; r3u4l9 = q9; r4u4l10 = q10; r4u5l11 = q11.$$

We form the function of transmission from sign subject's area q to the classification sign local area m . That is from the sign common amount into domain amount determine the signs, which can be characterized according to the criterion, for example, student's activity level.

$$q1 \vee q2 = m1; q3 \vee q6 \vee q7 \vee q8 \vee q6 = m2; q6 \vee q5 \vee q9 \vee q10 \vee q11 = m3 \quad (1)$$

Taking to the account the dependence of domains signs q on the subject variables r, l, u , and the relationship between signs subject areas q and signs local area classifications m (1), dependence of local areas m on subject variables r, l, u are as follows:

$$m1 = r1u1(l1 \vee l2); m2 = r2u3l3 \vee r3u2l8 \vee r3u3(l4 \vee l5) \\ m3 = r3u2(l6 \vee l7) \vee r3u4l9 \vee r4u4l10 \vee r4u5l11.$$

Predicate $P(r, l, u, m)$ depict the classification relationships between the training methods is as follows:

$$P(r, l, u, m) = m1r1u1(l1 \vee l2) \vee m2r2u3l3 \vee m2r3u2l8 \vee m2r3u3(l3 \vee l5) \vee \\ \vee m3r3u2(l6 \vee l7) \vee m3r3u4l9 \vee m3r4u4l10 \vee m3r4u5l11$$

The rapid growth of heterogeneous information requires a search for new ways of their compact presentation. One of the important approaches is visualization that is the mode of data presentation in a two-dimensional or three-dimensional moving and fixed images. Most part of the information that is available

for humans cannot be represented in two- or three-dimensional form without losses. Therefore, it is important to solve the problem of reducing these losses, i.e. the preservation of informativity in the construction of multi-dimensional data to a convenient for human perception form.

The predicate P can be visually represented as a graph (Figure 1). Graphic representation shows that teaching methods by the student's activity level criterion can be represented in a form of three-pole graph. Poles correspond to the student's activity level: passive $m1$, semi-active $m2$, active $m3$. By the student mental activity level dominate methods of usage $r3$, creativity $r4$ in the pole $m3$. According to the dominated in the pole $m2$ by the student mental activity level is the usage level $r3$, and by the inclusion into the creative activity level – reproductive $u2$.

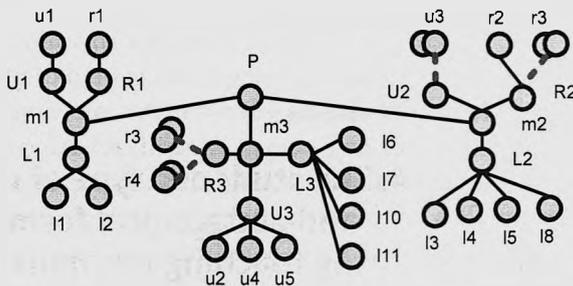


Figure 1. Classification of teaching methods by the student's activity level criterion.

Source: own elaboration.

If to form the function of the transition from domain knowledge area q to sign classification local area m on the other criterion, for example, on the domain mode of content transition, then the local area m will be as follows:

$$q1 \vee q3 \vee q8 \vee q9 \vee q10 = m1; q2 = m2; q4 \vee q5 \vee q6 \vee q7 \vee q11 = m3 \quad (2)$$

Predicate $P(r, l, u, m)$ taking to the account the signs (2) as follows (Figure 2):

$$P(r, l, u, m) = m1r1u1l1 \vee m1r2u3l3 \vee m1r1u3l5 \vee m1r3u4l9 \vee m1r4l1u4l10 \vee m2r1u1l2 \vee m3r3u2(l1 \vee l7 \vee l8) \vee m3r3u3l4 \vee m3r4u5l11$$

So teaching methods based on the mode of transmission of content divided into three options: auditory $m1$, visual $m2$, kinesthetic $m3$ (Figure 2). Accordingly, the structure of the graph with three poles is formed. As an additional example of this is the classification by the student mental activity level and classification by the inclusion into creative activities level.

It is seen from the graph, that in variant $m1$ methods of recognition are used more frequently $r1$, in variant $m3$ methods of usage $r3$ and reproduction $u2$.

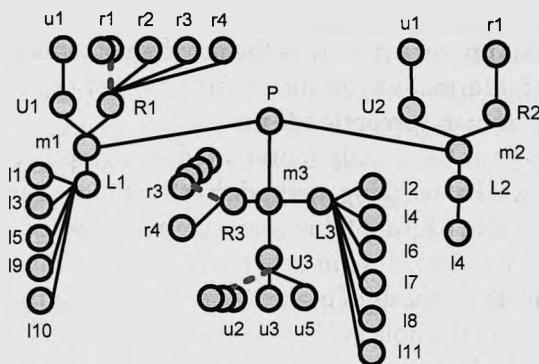


Figure 2. Classification of teaching methods by the dominant mode of content transition criterion

Source: own elaboration.

4. The students' type of consciousness and pedagogical forms of influence are on it using teaching methods classification

We show the relationship between selected dominant criteria for methods classification and components of the educational process is shown. That is to select the most effective teaching method according to such criterions as students' type of consciousness, temper, dominating information processing etc.

Some didactists and authors of textbooks [Babanskij 1985; Mahmutov 1986; Rzeleznjakova 2006: 46-54] propose criteria that should guide the choice of teaching methods. So the choice of teaching methods will be determined:

1. Laws and principles of teaching.
2. The objectives and tasks.
3. The content and methods of science in general and specific subject, topic.
4. Students learning opportunities:
 - a) age (physical, mental);
 - b) the level of preparedness (education and upbringing);
 - c) the student community peculiarities;

The external environment features (geographical, industrial environment, etc.).

Opportunities teachers themselves: their previous experience, knowledge of typical learning process situations, which are the most effective some methods combination, the level of theoretical and practical grounding, the ability to use

certain methods, tools, the ability to choose the best option, personal qualities and others.

Students educational opportunities significantly affect the quality of the learning process. Student learning capabilities and student's type of consciousness are important as well.

The learning capability of the audience should be taken into consideration as well. In general, the features of learning capability are considered as the following:

- activity – the ability of orientation in the new environment;
- creative activity – transferring of the known solving problems methods into new conditions;
- mental activity – the velocity of new concepts and modes of life creation;
- pace, thrift (the amount of material on which the problem is solved, the number of steps), performance, endurance;
- susceptibility to help another person, which can be measured by the number of dosed assistance, necessary for the student to complete the task.

The learning process for different types of consciousness should contain elements of belief that requires the ability to handle arguments and counterarguments, considering the position that is taught, from different angles, including the possible disagreement and resistance of those who are influenced by new arguments [Kunicina et al. 2001]. Unreliable but subjectively convincing information can sometimes be used as arguments.

When we speak about reasoning, the question inevitably arises: in what cases should we represent only our view and our arguments in one-sided manner and when it might turn out to be more successful to provide simultaneous usage and arguments of the opposite side.

In other words, if you have decided to hold a class discussion about the dangers of industry air emissions, then is it enough to point out the negative consequences such as a variety of serious diseases or it would be more appropriate to discuss the arguments of proponents as well (the damage of the emissions is less than derived products, it helps to create new materials – then the process will be improved and emissions will be reduced, etc.) and decide together what is more important? The first option of offering the information has been titled “One-sided argumentation,” the second one – “two-sided argumentation.”

During the classical experiments of Charles Howland and his colleagues, it was found that two-sided argumentation is more suitable for educated audience, and also for those who do not agree with the opinion of the communicator. If the objectives of the audience match with those of the communicator and also listeners have incomplete secondary education or one or two courses of higher education, then one-sided argumentation will work better. We can make a conclusion, that in the case, when auditory is of low competence the best is prevailing

opinion thrust method. In the case of high competence level, it is better to give auditory the possibility to fulfill problem analysis and to synthesize the end result on the obtained data.

Konstantin Fedotov identifies the following types of consciousness²: philosophical, scientific, religious, artistic, household. Eliena Marantsman [2005] distinguishes people with the following mental composition, common with Fedotov's division: mathematical, humanitarian, artistic and practical.

Scientific type (changes over time at new knowledge receiving). Formed by basic public knowledge and special education. Phenomena understanding and ability to explain them, the cause and effect relationships forming. Manifested in intellectual activity as follows: an attempt to find new approaches or explanation, build/formulate some theory or hypothesis. Manifested in behavior, thoughtfulness, search for new information, teaching. Neural networks location that support this type of mind – left brain hemisphere: the relationship with consciousness; methodical thinking; thinking aimed at analysis and control; temporal processes; conceptual similarity.

People with a mathematical mind structure have symbolic thinking, when the information transformation using input rules takes place (such as algebraic rules). The result – an opinion, expressed in the structures form and formulas that capture the essential relationship between the characters.

Religious type (weakly disposed to changes, quickly formed). The basis of formation – religion and doctrine. The awareness of spiritual needs (creativity, knowledge of the world, religious states). Moral behavior and observance of morality. Ritual life mode, closeness to society. Manifested in intellectual activity as follows: focus on the only one (God, creativity, love). Manifested in behavior: focus on states and their ministry, detachment from the turmoil. Neural networks location that support this type of mind, – right brain hemisphere: auditory area; visual sphere; perception; complete function; creative function; image memory.

Philosophic type (weakly disposed to changes, slowly formed). The basis of learning – existing philosophic schools, studies. Integrated life view. Combines different knowledge and allows to look widely at phenomena. Manifested in intellectual activity as follows: how to connect one with the other? How one can influence the other? Manifested in behavior: thoughtfulness, observation. Neural networks location that support this type of mind, – right and left brain hemispheres.

The individuals with the humanitarian thinking structure prefer sign thinking mode. It is characterized by the information transformation with the help of conclusions. The signs are combined in the larger units. The result is an opinion

² www.ipnrou.ru/article.php?idarticle=011169 [access: 15.12.2016].

in the concept or quotation form, which fixes the essential relations between the mentioned subjects.

Art type (changes over time due to changes in tastes and attitudes in the environment/society, emergence of new experience). The basis of formation – creative activities. Self-actualization of talents, intuitive attitude towards life, work. Manifested in intellectual activity as follows: new ideas appear, spontaneous binding one with another. Manifested in behavior, obsession with certain activities. Neural networks location that support this type of mind, – right brain hemisphere: auditory area; visual sphere; perception; complete function; creative function; image memory.

Subjects with artistic mind structure have image thinking. This is a separation from the object in space and time, the transformation of information through actions with images. Operations can be carried out sequentially and simultaneously as well. The result is the idea embodied in the new image.

Household type (changes quickly with changes in society and environmental conditions, taking into account the emergence of new technologies, development of new ways of doing things). Formed as a result of personal experience and learning derived from other people (parents, teachers, caregivers, friends, colleagues, etc.): how and what to do in a particular situation. It has its own specific features taking to the account the environment and culture (in different societies they build, treat, do business, cook, etc. in different way). Manifested in intellectual activity as follows: thoughts on the current situation and the problems that arise according to changes in the environment and main activity. Manifested in behavior: action direction to plan realization, obstacles removal, needs meeting. Neural networks location that support this type of mind, – left brain hemisphere: connection with consciousness; methodical thinking; thinking aimed at analysis and control; temporal processes; conceptual similarity.

People with practical mind structure have an objective thinking, which is characterized by the inextricable link with the object in space and time, the information transformation using substantive action, sequential operations. The result of this thinking is the idea embodied in the new design.

Given classification taking into consideration³ can be summarized in Table 3.

The comparative characteristics of various teaching methods is given in work⁴ (Table 4).

From the given tables can trace the relationship between students' consciousness types, relevant data transformations, typical for this type of awareness train-

³ www.elitarium.ru/sobesednik-tip-myshlenija-vosprijatie-informacii-reprezentativnaja-sistema-obshhenie-vlijanie/ [access: 12.01.2016].

⁴ <http://docplayer.ru/201500-Ispolzovanie-interaktivnyh-metodov-obucheniya-kak-sredstvo-aktivizacii-poznavatelnoj-deyatelnosti-uchashchih-sya.html> [access: 15.12.2016].

Table 3. Consciousness types and predominant information processing

Consciousness types	Thinking structure	Result of mental processes	Dominating information processing
Household	Practical	Thinking construction	Kinesthetic
Art	Artistic	Image	Visual
Philosophic	Humanitarian	Concept, quotation	Audial, visual
Religious			
Scientific	Mathematic	Structure, formula	Audial, visual

Source: own elaboration.

Table 4. Comparative characteristics of various teaching methods

Methods	Form		Develop		
	Knowledge	Skills	Thinking	Memory	Language
1. Verbal	++	-	-	-	++
2. Work with a book	+	+	+	+	+
3. Teaching discourse	++	-	++	+	++
4. Visual	+	+	+	++	-
5. Independent work	++	++	++	+	+
6. Practical	+	++	++	+	-
7. Oral, written control	++	-	+	+	++

++ solves very well; + solves partially; - solves weakly.

Source: own elaboration.

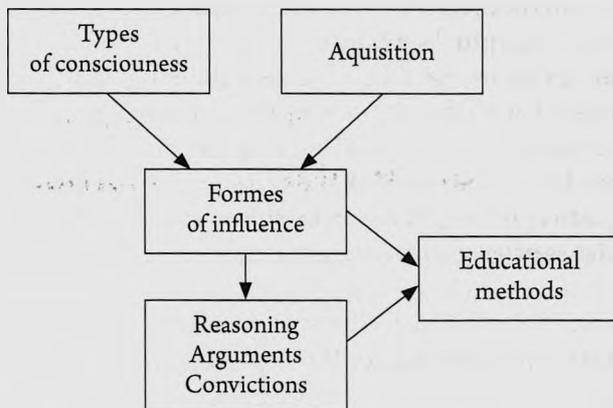


Figure 3. Consciousness types, level of acquisition of the student and pedagogical forms of influence

Source: own elaboration.

ing methods, which best suit students with different consciousness types and mind structure. It is necessary to take into account the elements of persuasion, proves, arguments and student's learning capability (Figure 3).

5. Conclusions

Diversity in approaches to methods classification does not determine the uncertainty in didactics on this point. This "natural process of learning methods evolution in which each author is entitled to own approach. Moreover, each classification is principally conceived by the author with the maximum coverage of the learning process factors in the system: learning objectives – the content and logical structure of educational material – the principles and means of teaching – teacher – student – methods. And still most of the classifications, although calculated on the ideal application universality, however, have their functional orientation and practically solve a specific pedagogical problem from the positions of the leading factor (the form, content, training material, etc.)" [Sydorenko 2006: 25].

The proposed new approach to teaching methods classification with the use of the memberwise disjunction mechanism in training methods classification allows to take to the account wider range of different teaching methods. The use of visualization using graphs makes the perception of the more complete classification and focuses on its features. Visualization with the help of graphs simplifies the perception of such classification and focuses attention on its features.

Depending on the objectives of effective learning provision, it is possible to change the dominant criteria, and accordingly choose an effective, in this case, teaching methods. In the given example, a logical connection between teaching methods and students' types of consciousness and thinking is shown.

References

- Aleksjuk A., 1981, *Zagalni metody navchannja v shkoli*, Kyjiv: Znannja.
- Babanskij Yu., 1985, *Metody obuchenja v sovremennoj obrazovatelnoj shkole*, Moskva: Prosveschenie.
- Fedotov K., *Tipy soznania i upravlencheskije reshennja*, www.ippnou.ru/article.php?idarticle=011169 [access: 15.12.2016].
- Kak vyjasnjat i ispolzovat dominirujushchije tipy myshlenija vashyh sobesednikov*, www.elitarium.ru/sobesednik-tip-myshlenija-vosprijatie-informacii-reprezentativnaja-sistema-obshhenie-vlijanie/ [access: 15.12.2016].
- Kunicina V.N., Kazarinova N.V., Pogolsha V.M., 2001, *Mezlichnostnoje obshchenije*, SPb: Piter.

- Marantsman M.I., 1986, *Formy i metody obshcheobrazovatelnoj podgotovki i kommunisticheskogo vospitania uchshchihsja srednich PTU*, Moskva: Pedagogika.
- Metody obuchenia*, <http://vaniorolap.narod.ru/theme11.html> [access: 15.12.2016].
- Onyshchuk V.A., Kobzar B. et al., 1987, *Didaktika sovremennoj shkoly*, Kyjiv: Rad.shkola.
- Podlasyj I.P., 2003, *Pedagogika*, Kniga 1: *Obshije polarzenia. Proces obuchenia*, Moskva: Vlados.
- Rzeleznjakova O.M., 2006, Dopolnitelnost kak inovtsionnyj podhod k klasifikaciji i vyboru metodov obuchenia, *Innovacii v obrazovanii*, 4, 46-54.
- Slsatenin V.A., Isajev I.F., Shyjanov E.N., 2002, *Pedagogika*, Moskva: Izdatelskij tsentr "Akademia."
- Sydorenko V.K., 2006, Klasyfikacia metodiv nvchannia na osnovi vidnoshen kategoriji zmistu i formy, *Suchasni informacijni metodyky navchannia u pidgotovci fahivciv: metodologia, teoria, dosvid, problemy*, 9, 21-27.
- Vinogradova E., Golovenko T., Voronovych V., Kudrjajtseva S., Telesh N., *Ispolzovanije interaktivnyh metodov obuchenia kak sredstvo obuchenia poznavatelnoj dejatelnosti uchshchihsja*, <http://docplayer.ru/201500-Ispolzovanie-interaktivnyh-metodov-obucheniya-kak-sredstvo-aktivizacii-poznavatelnoy-deyatelnosti-uchashchihsya.html>, [access: 15.12.2016].
- Zinko R.V., 2015, *Vykorystannja metodu pochlennoi dyzjunkciji dlja syntezy mashyn*, XIV Miznarodna naukovo-technichna konferencija "Vibracii v technici i tehnologijah," Ukraina, Dnipropetrovsk.

Zastosowanie mechanizmu dysjunkcji w wyborze metody nauczania a osobowość studenta

Streszczenie. Rola klasyfikacji metod nauczania polega na tym, że umożliwia analizę potencjału poszczególnych metod i określa sposoby ich doskonalenia, rozwoju i realizacji. Istnienie wielu typologii metod nauczania odzwierciedla złożoność zagadnienia i wagę zadań stawianych przez społeczeństwo przed współczesną szkołą. Celem artykułu jest przedstawienie podejścia klasyfikacyjnego opartego na mechanizmie dysjunkcji, które uwzględnia większą liczbę czynników. Dzięki zastosowaniu diagramów ilustrujących proponowaną klasyfikację możliwe jest zachowanie wartości informacyjnej wielowymiarowych danych w przejrzystej formie, co ułatwia zrozumienie klasyfikacji oraz wypukła jej istotne cechy. W zależności od konkretnych warunków efektywnego kształcenia podejście to pozwala na zmianę kryteriów i wybór odpowiedniej metody. Artykuł przedstawia związek między metodami nauczania a typami osobowości uczniów i ich preferencjami poznawczymi.

Słowa kluczowe: klasyfikacja metod nauczania, mechanizm dysjunkcji, diagram, wizualizacja, preferencje poznawcze, typy osobowości