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## **ABOUT THE REFORM IN HIGHER EDUCATION OF UKRAINE: NEW CLIENTS' REQUIREMENTS TO TEACHERS<sup>1</sup>**

*Abstract:* The aim of this study is to investigate the preferences of Ukrainian students in the way of learning in lectures. The paper provides an answer to the following didactic and research question: "How to teach?" in the context of the reform of Ukrainian Higher Education. In paper, we see students as clients because their preferences are clients' requirements. Statistically proven that Ukrainian students do not prefer the auditory way of learning in lectures. The result is statistically significant (95.0%). The result of the study may be useful at the input stage of the reform of Ukrainian Higher Education, including for the formation of training programs for teachers.

*Key words:* didactics, process of education, way of learning in lectures, auditory way, visual way, student's preferences, reform of Ukrainian Higher Education.

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<sup>1</sup> The article contains test results that are part of the scientific project WPL BS Economics and management of educational systems and processes, 2018 carried out at the Pedagogical University in Krakow.

## Introduction

The study was carried out in Ukraine in 2018 with the support of the Eastern European Research Group (Azerbaijan, Belarus, Poland, Serbia, Ukraine). The authors thank students who took part in the survey for their understanding, time and honesty. We will discuss the process of learning by the students, which is happening in the lectures.

Lecture it is logical consistent presentation of certain scientific knowledge to students. This is one of the main forms of educational process in Higher Education. Lectures appeared in Ancient Greece and other Ancient States. Then they became widespread in medieval Universities. And further lectures have maintained its leading role in Higher Education to date. According to *Formi i metodi obuchenia*<sup>2</sup>, the lecturer acts as a mediator between science and students.

Auditory learning is a learning style in which a person learns through listening. An auditory learner depends on hearing and speaking as a main way of learning<sup>3</sup>.

An auditory learner is someone that learns through listening and speaking. This type of learner needs to hear information to be able to process and comprehend as well as have the opportunity to reinforce that information orally<sup>4</sup>. Let's discuss the characteristics of an auditory learner. An auditory learner:

- learns by sound,
- is able to process information, such as instructions or content information, without writing it down,
- enjoys actively participating in discussions, both in small groups and as a whole class,
- remembers experiences and information in detail, such as names, places, dates, etc.

The purpose of the paper was to evaluate the views of students over Auditory Teaching and Learning Strategy for an interactive and communicative classroom environment. A qualitative research method was used to evaluate and compare the views of the students on Auditory Learning and Teaching Strategy in the classroom. To obtain necessary data from participants, authors asked two

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<sup>2</sup> *Formi i metodi obuchenia*, [https://vuzlit.ru/439916/formy\\_metody\\_obucheniya](https://vuzlit.ru/439916/formy_metody_obucheniya), access: 02 March 2018.

<sup>3</sup> M. J. Kostelnik, A. K. Soderman, A. P. Whiren, *Developmentally Appropriate Curriculum: Best Practices in Early Childhood Education* (3rd ed.). Columbus: Pearson, Merrill Prentice Hall, 2004.

<sup>4</sup> J. Carnevale, *Auditory Learners*, <https://study.com/academy/lesson/auditory-learners-definition-characteristics.html>, access: 03 May 2018.

open ended questions to the participant students: How can you learn foreign language best in the classroom environment? and What kind of teaching or learning strategies does your foreign language teacher use and implement in the classroom? The views of the students obtained through interviews suggest that their skills, attitudes and predispositions to Auditory Learning Style are significant and determinative factors for learning effectively<sup>5</sup>.

New sources of visual information are breaking into life again and again. There are TV, Internet, mobile phone, social networks etc. in the last 50 years. Of course, this affects young people.

Visual learners have specific characteristics that make their learning method unique. At school, visual learners typically<sup>6</sup>:

- remember what they read rather than what they hear,
- prefer reading a story rather than listening to it,
- learn from seeing things written out on a chalkboard,
- use diagrams and charts to understand ideas and concepts,
- take notes during class or while listening to presentations,
- study by looking over things,
- are good at spelling,
- use color to organize information,
- need quiet study time,
- often prefer to work alone rather than in groups,
- may not understand verbal instructions,
- ask a lot of questions to seek clarification,
- need to be able to see the teacher.

Does Higher Education need to change in the Wake of technological progress?

There are many classrooms in Higher Education that are not equipped with visual learning tools. We write about the Universities we have seen. This means that in these Universities main part of the lectures are conducted by the auditory way.

From the other hand, young Ukrainian people have changed. Young Ukrainian people are following technological advances. Their way of thinking is changing. Various studies report that 75 of all information processed by the brain is derived from visual formats. Furthermore, visual information is mapped

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<sup>5</sup> Fil. Kayalar, Fet. Kayalar, *The effects of Auditory Learning Strategy on Learning Skills of Language Learners (Students' Views)*, IOSR Journal of Humanities and Social Science (IOSR-JHSS), Volume 22, Issue 10, Ver. VII, 2017, p. 04-10.

<sup>6</sup> Th. Spanella, *Visual Learning Style*, <https://study.com/academy/lesson/visual-learning-style-definition-characteristics.html>, access: 28 March 2018.

better in students' minds<sup>7</sup>. And it is possible that students do not prefer an auditory way of learning by now.

Below the authors answered the rhetorical question of didactics<sup>8</sup>: "how to teach" students in modern conditions? In the paper it is considered the attitude of Ukrainian students to the way of learning in lectures. It has been studied two alternative ways of learning in lectures: the auditory way and the visual way.

The paper introduces a new concept to increase student's analytical thinking skills based on a visual learning strategy. Such a strategy has three fundamental components: a teacher, a student, and a learning process. The role of the teacher includes monitoring the learning process by considering the most productive way to improve higher-order thinking (HOT) skills. Author introduced a meaningful learning strategy for the classroom that promotes the presentation of information in visual formats such as images, diagrams, flowcharts and interactive simulations<sup>9</sup>.

After that, author compared visual and traditional learners based on their HOT skills, which were evaluated using the SWOT model. Author's results showed that visual learning tools increased the students' HOT skills<sup>10</sup>.

Although learning styles have "enormous popularity", and both children and adults express personal preferences, there is no evidence that identifying a student's learning style produces better outcomes<sup>11</sup>.

That is why we will not study the results of learning in lectures. We will study the priorities of Ukrainian students in the process of obtaining knowledge in lectures.

## **The aim, materials and methods**

The aim of the study is to answer the question: do Ukrainian students prefer the auditory way of learning in lectures?

The main research methods were questionnaire survey, statistical processing of questionnaires, verification of statistical hypotheses. The questionnaire was created at the Pedagogical University in Krakow. The methodology of statis-

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<sup>7</sup> R. Williams, *Visual Learning Theory*, 2009, [http://www.aweoregon.org/research\\_theory.html](http://www.aweoregon.org/research_theory.html), access: 28 March 2018.

<sup>8</sup> *Didaktika kak oblast pedagogiki*, <http://www.studfiles.ru/preview/3048519/page:4>, access: 02 May 2017.

<sup>9</sup> J. Raiyn, *The Role of Visual Learning in Improving Students' High-Order Thinking Skills*, *Journal of Education and Practice*, Vol.7, No.24, 2016, p. 115-121.

<sup>10</sup> *Ibidem*.

<sup>11</sup> H. Pashler, M. McDaniel, D. Rohrer, R. Bjork, *Learning Styles: Concepts and Evidence*. "Psychological Science in the Public Interest", 9 (3), 2009, p. 105-119.

tical research was borrowed from the source *BUS\_9641\_Business\_Statistics\_3*<sup>12</sup>. The study was since January till April 2018. The survey was attended by students of National Technical University of Ukraine "KPI them. Igor Sikorsky in Kiev", Odessa national Academy of food technologies in Odessa.

National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" was founded in 1898 as Kyiv polytechnic institute of Emperor Alexander II and now it is a national autonomous state higher education institution of research type. Today Igor Sikorsky Kyiv Polytechnic Institute is the largest technical university of Ukraine among universities of research type, one of the leading universities in Europe and world. About 25,000 students study here, including foreign students. University has 19 faculties, 9 educational and scientific institutes, several scientific and research institutes and educational centers<sup>13</sup>.

**Tabela 1.** Characteristics of respondents

Specialty	Number (M/F)	Training form	University
Computer science, master study	24 (20/4)	full-time	National Technical University of Ukraine "KPI them. Igor Sikorsky"
Accounting and audit, bachelor course	10 (2/8)	full-time	Odessa national Academy of food technologies
Marketing, bachelor course	22 (3/19)	full-time	
Total number of respondents:	56 (25/31)	-	-

**Source:** Own survey.

The Odessa national Academy of Food Technologies (ONAFТ) is a recognized leader in implementing the finished innovation developments in agriculture. The scientists of Academy study fundamental research problems in the areas of refrigeration and power engineering, thermal physics, electric energy, energy saving, ecology and information technologies. Since 2003 Academy participates in the implementation of the State scientific and technical program in the field of environmental protection and sustainable development. The scientific achievements are represented in international forums of investments and innovations (<http://www.studyinukraine.com/universities/odessa-national->

<sup>12</sup> *BUS\_9641\_Business\_Statistics\_3*, Textbook for the Program "Masters of Business Administration" – USA. NY. Kingston University, 2010, 122 p.

<sup>13</sup> <http://kpi.ua/en/about>, access: 02 May 2017.

academy-food-technologies). ONAFT always is oriented to the leader. 112 years of successful development proved correctness of the main principle – to count on the leader. Today the ONAFT is the leader in Ukraine in training of specialists for food and grain-processing industry. This fact as back to 2010 was recognized by the Ministry of Agrarian Policy and Food of Ukraine, the Ukrainian Grain Association, the "Ukrainian Ice-Cream" Association, the Union of poultry breeders of Ukraine, the Union of mixed fodder producers of Ukraine and by many other professional associations<sup>14</sup>.

The characteristic of respondents is given in Table 1.

Thus, there were 56 respondents from two Ukrainian Universities who took part in the survey. It was three groups of respondents of technical and natural-scientific orientation. These were full-time students.

The main question discussed in the paper was: What way of learning in lectures do I prefer? There were three possible answers:

1. The teacher has a presentation, and I write with a slide show.
2. The teacher slowly dictates, and I write.
3. The teacher quickly says, and I write.

The first answer refers to the visual way of learning in lectures. The second and third answers refer to the auditory way of learning in lectures.

## Results and discussion

**Step 1.** Primary and statistical processing of questionnaires: what are the new clients' requirements to teachers?

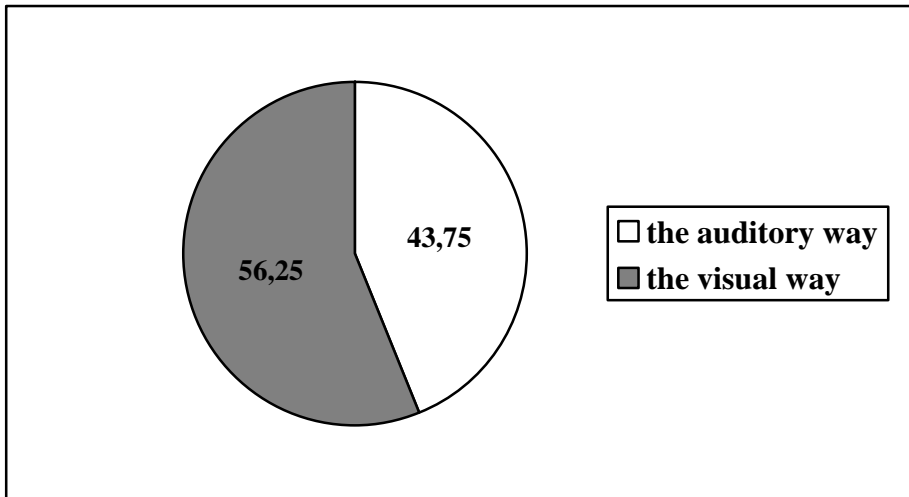
**Table 2.** The results of processing of questionnaires (number of choices of different responses)

Specialty	The number of choices			$M_x$	$\delta_x$	$\delta_{x-1}$
	response 1	response 2	response 3			
Computer science, master study	18	3	3	0.75	0.43	0.44
Accounting and audit, bachelor course	5	4	1	0.50	0.50	0.52
Marketing, bachelor course	8,5	13,5	-	0.39	0.47	0.49

**Source:** Own survey.

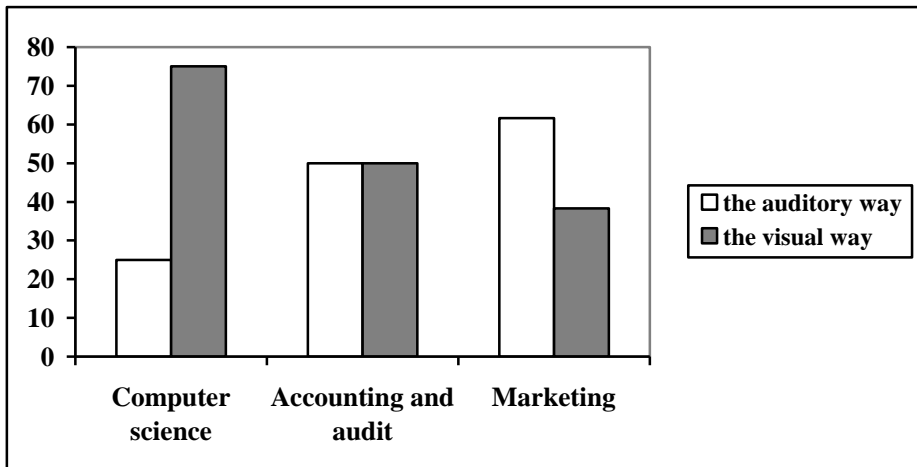
<sup>14</sup> <https://www.onaft.edu.ua/rector>, access: 02 May 2017.

**Figure 1.** The number of choices of the auditory way and the visual way of learning in total, %



Source: Own survey.

**Figure 2.** The number of choices of the auditory way and the visual way of learning by specialities, %



Source: Own survey.

The results of primary and statistical processing of questionnaires are given in Table 2. Answer №2 and answer № 3 were combined for the study. The value "0" is assigned to the auditory way of learning for statistical calculations.

The value "1" is assigned to the visual way of learning in lectures. The ratio of the audio and visual ways of learning is shown in Figure 1 and Figure 2.

Figure 1 shows the overall situation in three groups of respondents. It shows that the auditory way of learning does not dominate in the preferences of Ukrainian students. The figure shows that the visual way of learning dominates in the preferences of Ukrainian students. Are they the new clients' requirements to teachers? May be, may be, not. Figure 1 is not the basis for a strong proof.

Figure 2 shows the situation in each of three groups of respondents. Figure 2 shows that the auditory way of learning does not dominate in the preferences of Ukrainian students. The visual way of learning does not dominate in the preferences of Ukrainian students also. It is not clear: what are the new clients' requirements to teachers?

That is why two alternatives were considered at the stage of verification of statistical hypotheses:

1. Students prefer the auditory way of learning in lectures.
2. Students prefer the visual way of learning in lectures.

**Step 2.** Verification of statistical hypotheses to determine students' choice: Students prefer the auditory way of learning in lectures

Hypothesis testing: Students prefer the auditory way of learning.

Null hypothesis  $H_0: \mu = 0.0$ .

The null hypothesis argues that the unknown average of the general population of students in Ukraine  $\mu = 0.0$ . The null hypothesis sounds: Students prefer the auditory way of learning in lectures, if you do not take into account random deviations.

Alternative hypothesis  $H_1: \mu \neq 0.0$ .

The alternative hypothesis argues that the unknown average of the general population of students in Ukraine  $\mu \neq 0.0$ . The alternative hypothesis sounds: Students do not prefer the auditory way of learning in lectures.

Table 3 shows data for the verification of statistical hypotheses for  $\mu_0 = 0.0$ .

The size  $t_{\text{stat}}$  more than value  $t_{\text{tab1}}$  for the level of significance 95.0% (Table 3). Therefore, we accept alternative hypothesis: the unknown average of the General population  $\mu \neq 0.0$ . This means, students do not prefer the auditory way of learning in lectures, if you do not take into account random deviations.

For the level of significance 95.0%, we accept the following result: The General population of Ukrainian students does not prefer the auditory way of learning in lectures. Teachers should use visual ways to teach students in lectures. They are new clients' requirements to teachers.



**Table 3.** Data to verification of statistical hypotheses

Indicator	Group number		
	1	2	3
the size of a sample, n	24	10	22
the expected value, $\bar{X}$	0.75	0.50	0.39
the standard deviation for the sample, $\delta_x$	0.43	0.50	0.47
average error, $\hat{S}_X = \delta_x / \sqrt{n}$	0.09	0.16	0.10
quantitative variable $ t_{stat} $ for $\mu_0 = 0.0$ , $(\bar{X} - \mu_0) / \hat{S}_X$	8.333	3.125	3.900
the value $t_{tabl}$ for the level of significance 95.0,% <sup>15</sup>	2.069	2.262	2.080
Result, $ t_{stat}  > t_{table}$	Yes	Yes	Yes

**Source:** Own survey.

**Step 3.** Verification of statistical hypotheses to determine students' choice: Students prefer the visual way of learning in lectures. Hypothesis testing: Students prefer the visual way of learning in lectures. Null hypothesis  $H_0: \mu = 1.0$ . The null hypothesis argues that the unknown average of the general population of students in Ukraine  $\mu = 1.0$ . The null hypothesis sounds: Students prefer the visual way of learning in lectures, if you do not take into account random deviations.

**Table 4.** Data to verification of statistical hypotheses

Indicator	Group number		
	1	2	3
the size of a sample, n	24	10	22
the expected value, $\bar{X}$	0.75	0.50	0.39
the standard deviation for the sample, $\delta_x$	0.43	0.50	0.47
average error, $\hat{S}_X = \delta_x / \sqrt{n}$	0.09	0.16	0.10
quantitative variable $ t_{stat} $ for $\mu_0 = 1.0$ , $(\bar{X} - \mu_0) / \hat{S}_X$	2.778	3.125	6.100
the value $t_{tabl}$ for the level of significance 99,9% <sup>16</sup>	2.069	2.262	2.080
Result, $ t_{stat}  > t_{table}$	Yes	Yes	Yes

**Source:** Own survey.

Alternative hypothesis  $H_1: \mu \neq 1.0$ . The alternative hypothesis argues that the unknown average of the general population of students in Ukraine  $\mu \neq 1.0$ . The alternative hypothesis sounds: Students do not prefer the visual way of learning in lectures.

Table 4 shows data for the verification of statistical hypotheses for  $\mu_0 = 1.0$ .

<sup>15</sup> *BUS\_9641\_Business\_Statistics\_3*, op. cit., p. 42.

<sup>16</sup> *Ibidem*, p. 75.

The size  $t_{\text{stat}}$  more than value  $t_{\text{tabl}}$  for the level of significance 95.0% (Table 3). Therefore, we accept alternative hypothesis: the unknown average of the General population  $\mu \neq 1.0$ . This means, students do not prefer the visual way of learning in lectures, if you do not take into account random deviations.

For the level of significance 99.0%, we accept the following result: The General population of Ukrainian students does not prefer the visual way of learning in lectures. Auditory methods of teaching students in lectures should also be used by teachers. Thus, we found the answer to the question: do Ukrainian students prefer the auditory way of learning in lectures?

This is proved statistically that General population of Ukrainian students does not prefer the auditory way of learning in lectures. At the same time General population of Ukrainian students does not prefer the visual way of learning in lectures. The result is a real scientific fact.

Can we trust the results of our research? This is a lot or a little, to poll 56 respondents?

For example, in the paper of M.C. Guluță and C. Rusu<sup>17</sup> 50 respondents were interviewed only. It was enough to show a correlation. And in the paper Fil. Kayalar, Fet. Kayalar<sup>18</sup> the research was carried out with the participation of 15 university students only. Therefore, we are sure that 56 respondents are enough to get a reliable result in the study.

At the stage of verification of statistical hypotheses about the preferred way of learning in lectures, the results are statistically significant (95.0%). The result indicates that the decision will be correct in about 95.0% of cases and wrong only in 5.0% of cases. In this sense, we have a decision-making process with accurate, controlled probability. We are sure that General population of Ukrainian students does not prefer the auditory way of learning in lectures. They are new clients' requirements to teachers to change ways of teaching.

That is why the higher education system of Ukraine cannot ignore the interests of Ukrainian students who do not prefer the auditory way of learning in lectures. This means that the Ukrainian Higher Education needs a reform. This reform in higher education of Ukraine must reflect new clients' requirements to teachers:

- First of all, it is necessary to equip all lecture halls with visual learning tools.
- Secondly, it is necessary to train lecturers to use visual learning tools.

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<sup>17</sup> M.C. Guluță, C. Rusu, *Leadership styles and managerial behavior in Romanian companies*, „Polish Journal of Management Studies”, 13, 2, 2016, p. 69-80.

<sup>18</sup> Fil. Kayalar, Fet. Kayalar, op. cit., p. 04-10.

## Conclusions

1. It was studied the preferences of Ukrainian students in the way of learning in lectures. It is statistically proved that Ukrainian students do not prefer the auditory way of learning in lectures. They are new clients' requirements to teachers – teachers should use visual ways to teach students in lectures.
2. The result is statistically significant (95.0%). The result indicates that the decision will be correct in about 95.0% of cases and wrong only in 5.0% of cases. It means we have a decision-making process with accurate, controlled probability.
3. The result is a real scientific fact, which should be used in the reform of Higher Education in Ukraine. Among other things, we recommend to form new training programs for teachers. Teachers should learn to use visual ways of teaching students in lectures.

## Bibliography

1. *BUS\_9641\_Business\_Statistics\_3*, Textbook for the Program „Masters of Business Administration” – USA. NY. Kingston University, 2010, 122 p.
2. Carnevale J., *Auditory Learners*, <https://study.com/academy/lesson/auditory-learners-definition-characteristics.html>, access: 03 May 2018.
3. *Didactika kak oblast pedagogiki*, <http://www.studfiles.ru/preview/3048519/page:4>, access: 02 May 2017.
4. *Formi i metodi obuchenia*, [https://vuzlit.ru/439916/formy\\_metody\\_obucheniya](https://vuzlit.ru/439916/formy_metody_obucheniya), access: 02 March 2018.
5. Guluță M.C., Rusu C., *Leadership styles and managerial behavior in Romanian companies*, "Polish Journal of Management Studies", 13, 2, 2016, p. 69-80.
6. <http://kpi.ua/en/about>, access: 02 May 2017.
7. <https://www.onaft.edu.ua/rector>, access: 02 May 2017.
8. Kayalar Fil., Kayalar Fet., *The effects of Auditory Learning Strategy on Learning Skills of Language Learners (Students' Views)*, IOSR Journal Of Humanities And Social Science (IOSR-JHSS), Volume 22, Issue 10, Ver. VII, 2017, p. 04-10.
9. Kostelnik M. J., Soderman A. K., Whiren A. P., *Developmentally Appropriate Curriculum: Best Practices in Early Childhood Education* (3rd ed.). Columbus: Pearson, Merrill Prentice Hall, 2004.

10. Pashler H., McDaniel M., Rohrer D., Bjork R., *Learning Styles: Concepts and Evidence*. „Psychological Science in the Public Interest”, 9(3), 2009, p. 105-119.
11. Raiyn J., *The Role of Visual Learning in Improving Students' High-Order Thinking Skills*, Journal of Education and Practice, Vol.7, No. 24, 2016, p. 115-121.
12. Spanella Th. *Visual Learning Style*, <https://study.com/academy/lesson/visual-learning-style-definition-characteristics.html>, access: 28 March 2018.
13. Williams R., *Visual Learning Theory*, 2009, [http://www.aweoregon.org/research\\_theory.html](http://www.aweoregon.org/research_theory.html), access: 28 March 2018.

## **O REFORMIE W SZKOLNICTWIE WYŻSZYM: WYMAGANIA NOWYCH KLIENTÓW WOBEC NAUCZYCIELI**

Głównym celem przeprowadzonych badań naukowych było oszacowanie preferencji studentów w procesie zdobywania wiedzy (wykłady). Artykuł daje odpowiedź na następujące pytanie badawcze: „Jak się uczyć?” w warunkach przeprowadzanej reformy Szkolnictwa Wyższego w Ukrainie. Statystycznie udowodniono, że studenci wypowiedzieli się przeciwko audytoryjnemu sposobowi uczenia się na wykładach. Wyniki badań mogą okazać się przydatne na etapie wprowadzania reformy Szkolnictwa Wyższego w Ukrainie, w tym prawidłowego kształtowania kadry pracowników naukowo-dydaktycznych w systemie Szkolnictwa Wyższego.

Słowa kluczowe: dydaktyka, proces uczenia się, sposób uczenia się na wykładach, sposób audytoryjny, wizualny sposób, preferencji studentów, reforma Szkolnictwa Wyższego w Ukrainie.