

## HIGHER EDUCATION AS A BUSINESS: SHOULD BELARUSIAN UNIVERSITIES CHANGE THE WAY OF TEACHING AT LECTURES?

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**Abstract.** *The aim of this study is to investigate the preferences of Belarusian students in the way of learning at lectures. The paper provides an answer to the following didactic and research question: "How to teach?" in the context of economic reform. In paper, we saw higher education as a business. And we saw students as clients because their preferences are clients' requirements.*

*Statistically proven that Belarusian students do not prefer the auditory way of learning at lectures. That is why Belarusian Universities should change the way of teaching at lectures. Among other things, we recommend:*

- to equip all lecture halls with visual learning tools,
- to train teachers to use visual learning tools.

*The results are very highly statistically significant (99.9%).*

**Keywords:** *didactics, process of education, way of learning at lectures, auditory way, visual way, student's preferences, Belarusian Universities*

### Introduction

The study was carried out in Belarus in 2018 with the support of the Eastern European Research Group (Azerbaijan, Belarus, Poland, Serbia, Ukraine). The author thanks students who took part in the survey for their understanding, time and honesty.

We will discuss the teaching process of students, which is happening at lectures. The teaching process in Belarus is organized on the basis of [1, §1, Art. 89]:

- achievements in the field of science and technology, ...;
- pedagogically reasonable choice of forms, methods and means of education;
- modern educational and information technologies.

Lecture it is logical consistent presentation of certain scientific knowledge to students [2]. 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 [2], the lecturer acts as a mediator between science

and students.

It is the auditory way of learning, which dominates at lectures. It was in Ancient Greece, and it is now [2].

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

From the one hand, Universities should change the way of teaching, because there are changes in science and technology, including information technologies [1, §1, Art. 89]. The right of citizens of Belarus to education is ensured by "creating conditions for education taking ... as well as individual needs, abilities and needs of students" [1, §7, Art. 3]. Therefore, students of Belarusian Universities, as consumers of educational services, have the right to receive education in conditions that meet their individual needs.

From the other hand, young people have changed. Young people are following technological advances. Their way of thinking is changing. Their way of thinking is changing. And it is possible

that students do not prefer an auditory way of learning at lectures.

Below the author answered the rhetorical question of didactics [3]: "how to teach" students in modern conditions? In the paper it is considered the attitude of Belarusian students to the way of lectures. It has been studied two alternative ways of learning at lectures: the auditory way and the visual way.

We will see: do Belarusian students prefer the auditory way of learning at lectures?

The aim of the study is to answer the question: do Belarusian students prefer an auditory way of learning at lectures? This answer is a "hot" word in the discussion: should Belarusian Universities change the way of teaching at lectures?

### Methods

The main research methods were questionnaire survey, statistical processing of questionnaires, verification of statistical hypotheses [4]. The study considers the priorities of students in three directions:

- humanities (History),
- engineering Sciences (Forestry engineer),
- natural Sciences (Production management, Economics & management, Marketing).

The study was since January till April 2018. The survey was attended by students of Francisk Skorina Gomel State University and P.O. Sukhoi Gomel State technical University. The characteristic of respondents is given in Table 1.

Table 1. Characteristics of respondents

Nr	Specialty	Number (M/F)	Training form	University
1	History, bachelor course	16 (6/10)	full-time	Francisk Skorina Gomel State University
2	Forestry engineer, bachelor course	20 (14/6)	full-time	
3	Production management, bachelor course	20 (8/12)	full-time	
4	Economics & management, bachelor course	51	full-time	P.O. Sukhoi Gomel State technical University
2	Marketing, bachelor course	40	full-time	
	Total number of respondents:	147	-	-

Source: Own survey

Thus, there were 147 respondents from two Belarusian Universities took part in the survey. The main question discussed in the paper was:

- What way of learning at 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 teaching at lectures. The second and

third answers refer to the auditory way of teaching at lectures.

### Results

Step 1. Primary and statistical processing of questionnaires

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 teaching for statistical calculations. The value "1" is assigned to the visual way of teaching at lectures.

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			
1	History, bachelor course	12	1	3	0.75	0.43	0.45
2	Forestry engineer, bachelor course	12	8	0	0.60	0.49	0.50
3	Production management, bachelor course	14	4	2	0.70	0.46	0.47
4	Economics & management, bachelor course	32	17	2	0.63	0.48	0.49
5	Marketing, bachelor course	32	8	0	0.80	0.40	0.41
	Total number:	102	38	7	-	-	-

Source: Own survey

Step 2. Graphical representation of results: what are the new clients' requirements to teachers?

The ratio of the auditory and visual ways of teaching is shown in Figure 1 and Figure 2.

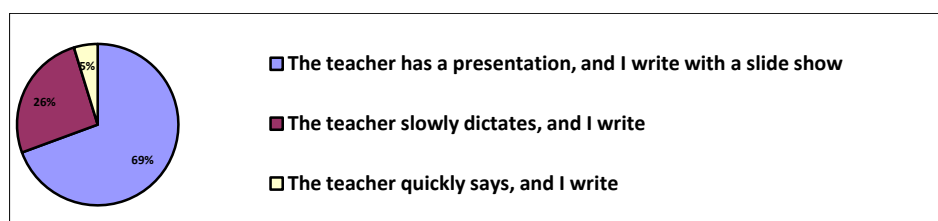


Figure 1. The number of students' choices of the auditory way and the visual way of teaching in total, %

Figure 1 shows that the auditory way of learning does not dominate in the preferences of Belarusian students. The visual way of learning dominates in the preferences of Belarusian students. Are

they the new clients' requirements to Belarusian Universities?

Answer №2 and answer № 3 were combined for the study on Figure 2.

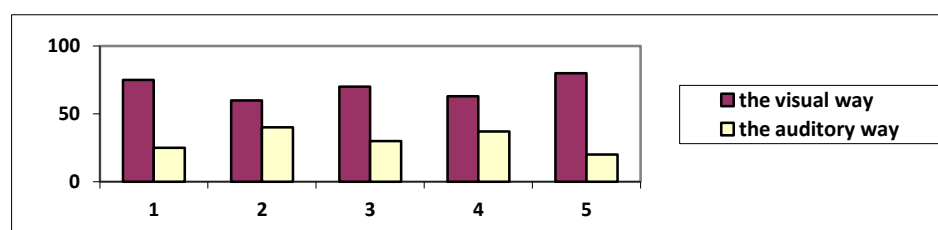


Figure 2. The number of choices of the auditory way and the visual way of learning by specialties, %

Figure 2 shows that the auditory way of learning does not dominate in the preferences of Belarusian students. The visual way of learning dominates in the preferences of Belarusian students. It is clear what are the new clients' requirements to Belarusian Universities? No, it's not clear. Figure 1 and Figure 2 showed results for two Universities only. It is necessary to verify statistical hypotheses in order to apply the results to students of all Belarusian Universities.

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

1. Students prefer the auditory way of learning at lectures.

2. Students prefer the visual way of learning at lectures.

Step 3. Verification of statistical hypotheses to determine students' choice: Students prefer the auditory way of learning at lectures

Hypothesis testing: Students prefer the

auditory way of learning at lectures.

Null hypothesis  $H_0: \mu = 0.0$ .

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

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

Table 3. Data to verification of statistical hypotheses

№	Indicator	Group number				
		1	2	3	4	5
1	the size of a sample, n	16	20	20	51	40
2	the expected value, $\bar{X}$	0.75	0.60	0.70	0.63	0.80
3	the standard deviation for the sample, $\delta_x$	0.43	0.49	0.46	0.48	0.40
4	average error, $\hat{S}_x = \delta_x / \sqrt{n}$	0.11	0.11	0.10	0.07	0.06
5	quantitative variable $ t_{stat} $ for $\mu_0 = 0.0, (\bar{X} - \mu_0) / \hat{S}_x$	9.090	5.455	7.000	9.000	13.33
6	the value $t_{tabl}$ for the level of significance 99.9%, [5, p. 42, table 9.1.1]	4.073	3.883	3.883	3.291	3.558
7	Result, $ t_{stat}  < t_{table}$	No	No	No	No	No

The size  $t_{stat}$  more than value  $t_{tabl}$  for the level of significance 99.9% (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 at lectures, if you do not take into account random deviations.

For the level of significance 99.9% [5, p. 75], we accept the following result: The General population of Belarusian 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 Belarusian Universities.

Step 4. Verification of statistical hypotheses to determine students' choice: Students prefer the visual way of learning

at lectures

Hypothesis testing: Students prefer the visual way of learning at lectures.

Null hypothesis  $H_0: \mu = 1.0$ .

The null hypothesis argues that the unknown average of the general population of students in Belarus  $\mu = 1.0$ . The null hypothesis sounds: Students prefer the visual way of learning at lectures, if you do not take into account random deviations.

Alternative hypothesis  $H_1: \mu \neq 1.0$ .

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

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

Table 4. Data to verification of statistical hypotheses

№	Indicator	Group number				
		1	2	3	4	5
1	the size of a sample, n	16	20	20	51	40
2	the expected value, $\bar{X}$	0.75	0.60	0.70	0.63	0.80
3	the standard deviation for the sample, $\delta_x$	0.43	0.49	0.46	0.48	0.40
4	average error, $\hat{S}_x = \delta_x / \sqrt{n}$	0.11	0.11	0.10	0.07	0.06
5	quantitative variable $ t_{stat} $ for $\mu_0 = 1.0, (\bar{X} - \mu_0) / \hat{S}_x$	2.272	3.636	3.000	5.285	3.333
6	the value $t_{tabl}$ for the level of significance 99.9%, [5, p. 42, table 9.1.1]	4.073	3.883	3.883	3.291	3.558
7	Result, $ t_{stat}  < t_{table}$	Yes	Yes	Yes	No	Yes

The size  $t_{stat}$  less than value  $t_{tabl}$  for the level of significance 99.9% (Table 4) for groups 1-3 and 5. Therefore, we accept Null hypothesis: the unknown average of the General population  $\mu = 1.0$ . This means, students prefer the visual way of learning at lectures, if you do not take into account random deviations. The result is very highly statistically significant. This suggests that, the decision will be correct in approximately 99.9% of the cases and incorrect in 0.1% of cases only. In this sense, we have the decision-making process with accurate, controlled probability [5, p. 75]. For the level of significance 99.9%, we accept the following result: The General population of students prefer the visual way of learning at lectures.

The situation with group 4 requires further study.

Thus, we found the answer to the question: do Belarusian students prefer the auditory way of learning at lectures?

It is graphically shown and statistically proved that General population of Belarusian students does not prefer the auditory way of learning at lectures. The result is a real scientific fact. There are new clients' requirements to Belarusian Universities: Belarusian students prefer the visual way of learning at lectures. For this reason, Belarusian Universities should change the way of teaching at lectures.

#### Discussion

Can we trust the results of our research? Is it enough to poll 147 respondents?

For example, in the paper of [6], 50 respondents were interviewed only. It was enough to show a correlation. Therefore, we are sure that 147 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 at lectures, the results are very highly statistically significant (99.9%). The results indicate that the decision will

be correct in about 99.9% of cases and wrong only in 0.1% of cases. In this sense, we have a decision-making process with accurate, controlled probability. We are sure that General population of Belarusian students does not prefer the auditory way of learning at lectures. That is why the higher education system of Belarus can not ignore the interests of Belarusian students who do not prefer the auditory way of learning in lectures. This means that Belarusian Universities should change the way of teaching at lectures:

- 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.

#### Conclusions

1. The research aim is achieved. It was studied the preferences of Belarusian students in the way of learning at lectures. It is statistically proved that Belarusian students do not prefer the auditory way of learning at lectures. They are new clients' requirements to Belarusian Universities - teachers should use visual ways to teach students at lectures.

2. The results are very highly statistically significant (99.9%). The results indicate that the decision will be correct in about 99.9% of cases and wrong only in 0.1% of cases. It means we have a decision-making process with accurate, controlled probability.

3. The results are a real scientific fact. And Belarusian Universities should change the way of teaching at lectures. Among other things, we recommend:

- to equip all lecture halls with visual learning tools,

- to train teachers to use visual learning tools.

4. The task of the future research is to survey students about the actual ways of presenting information at lectures by teachers.

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**ВЫСШЕЕ ОБРАЗОВАНИЕ КАК БИЗНЕС: ДОЛЖНЫ ЛИ ВУЗЫ БЕЛАРУСИ  
ИЗМЕНИТЬ СПОСОБ ОБУЧЕНИЯ НА ЛЕКЦИЯХ?**

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**Abstract.** *Целью данного исследования является изучение предпочтений белорусских студентов в процессе обучения на лекциях. В статье дан ответ на следующий дидактический и исследовательский вопрос: "как преподавать?" в контексте экономических реформ. В статье мы рассматривали высшее образование как бизнес. И мы рассматривали студентов как клиентов, потому что их предпочтения - это требования клиентов.*

*Статистически доказано, что белорусские студенты не предпочитают слуховой способ обучения на лекциях. Именно поэтому белорусские вузы должны изменить способ преподавания на лекциях. Среди прочего, мы рекомендуем:*

- оборудовать все аудитории визуальными средствами обучения,
- научить преподавателей использовать визуальные инструменты обучения.

*Результаты очень высоко статистически значимы (99.9%).*

**Ключевые слова:** *дидактика, процесс обучения, способ обучения на лекциях, слуховой путь обучения, визуальный путь обучения, предпочтения студентов, белорусские университеты.*