EXPERIMENTAL TEST OF EFFECTIVENESS OF ELECTRIC COURSES IN HIGHER EDUCATION

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Abstract: The article examines the experience of higher education institutions in the transition to distance learning, the widespread implementation of electronic science and special e-courses in the context of modernization of modern education. Based on the modified Xi square table and formula, the empirical value of the three-category questionnaire answers consisting of four options was calculated. The effectiveness of the study was tested on the basis of the dynamic changes in the attitude of students of the "Elective Course" to the culture of healthy living, specially organized in the field of physical culture education Turan wrestling and its teaching methods.

Аннотация: В данной статье рассматриваются вопросы перехода высших учебных заведений на дистанционное обучение, модернизации современного образования в области элективных сфер науки и практики специальных электронных курсов. На основе модифицированной квадратной таблицы Хи и формулы была рассчитана эмпирическое значение ответов на трехкатегорийный опросник, состоящий из четырех вариантов. В эксперименте было исследовано, что физическая культура обладает эффективностью исследования, основанной на динамических изменениях, наблюдаемых в отношении студентов "Элективного курса" к культуре здорового образа жизни, специально организованной в области предмета "Борьба Турон" дисциплины образования и методики его преподавания в направлении физическая культура.

I.Introduction

At present, according to the medical and demographic characteristics of the population of Uzbekistan, the level of health of students is one of the most important social indicators. There is empirical evidence that any disease in the context of a pandemic of globalization is directly related to higher education, as well as a decrease in the effectiveness of future careers (Y.P. Lisitsyn, 1999, 2004; V.A. Medik, 2003; M.Y. Abrosimova 2005, O.A. Naumenko 2005, A. S. Tverdoxlebov, 2005).

Based on the sources studied in the context of the problem, it should be noted that the urgency and practical importance of promoting, popularizing and modernizing the culture of healthy living in educational institutions is growing [1, 2, 3].

Scientific research in the CIS countries has studied health technologies, tools and methods of forming a culture of healthy living in students, the laws of the level of development of knowledge about healthy lifestyles and a specific research methodology in this area [7, 9].

Especially in the early stages of education, students are the most vulnerable part of the youth, as they face a number of difficulties arising from the workload, flexibility, low physical activity, social and interpersonal communication problems in the primary education environment [1].

II. Literature review

Recent decades have seen a downward trend in the health of young people and their physical fitness. This is due not only to changes in the economy, ecology, working and living conditions of the population, but also to the neglect of the majority of young people to the health and educational activities taking place in society. According to data provided by experts in the field of physical culture and sports in the CIS countries, 76% of students have low physical activity and 15-20% are overweight. The system of special tests used in the study of this problem (for example, the Cooper test) revealed the low physical fitness of most students [2].

In the case of separate sampled collections (higher education institutions), empirical observations showed that 37.7% of students had a general medical condition and 1.5% lower than the number of referrals during the three-year period. It summarizes the trend of chronic diseases by 1.6 times and the deterioration of health in the later stages of higher education. Especially due to the sometimes drastic economic, social, psychological changes of the globalization environment, the health of students in relation to stress is declining [2,3].

In the context of globalization, the pedagogical process of self-health of students involves the organization and improvement of educational content with modern technologies in practice through the joint and integrated organization of knowledge, skills, abilities and professional competencies aimed at health [4, 5, 6].

III. Analysis

It is known from foreign experience that in the context of modernization of modern education, electronic science, special e-courses are being widely implemented.

The elective course "Healthy Lifestyle Culture (HLC)" on the subject "Turon national struggle and its teaching methods" was introduced in the distance learning system of Bukhara State University in 2020-2021 academic years as an important component of comprehensive personal development in the field of pedagogical education. Elective courses are based on the choice of students, along with the disciplines taught in the field. The e-learning process is based on the idea of forming a healthy thinking and health care thinking shared with the knowledge, skills and competencies of the formation of a culture of healthy living through the development of individual abilities of students based on the learning resources of the planned

and remote electronic system [9]. The purpose of the elective course HLC for students of "Physical Culture" is to maintain and strengthen the health of students through the integration of socio-cultural, practical and valeological values of the basic discipline "Turan national struggle and its teaching methods", healthy thinking and self-awareness, aimed at creating a modern electronic environment for the formation of health care thinking.

Tasks of the elective course HLC through Turan national sports:

- To understand the role and pedagogical social significance of the national sport of Turan as a tool for personal development and preparation for future professional activities;

- To know the scientific-biological, pedagogical and practical-methodological bases of a healthy lifestyle through the national sport of Turan;

- To get accustomed to regular physical development and physical culture and sports (including the national sport of Turan) and to develop a motivational-value attitude to a healthy lifestyle, physical culture;

- Orientation to the development and improvement of personality traits and characteristics, psychophysiological abilities, psychological stability, maintenance and strengthening of health through the acquisition of practical skills and abilities through the national sport of Turan;

- To have personal experience in improving physical mobility and functional capabilities, to provide general and practical physical training in the conditions of future professional activity and life;

- Creating a basis for the use of scientifically and methodically based physical education and sports in order to achieve a more effective lifestyle and professional activity.

According to the purpose of this study, the main disciplines taught in the field of "Physical Culture" and in-depth study of these subjects, the organization of modern informative e-courses as a means of health care to solve the problem of forming a culture of healthy living the effectiveness of modern practice of enhancement requires experimental verification.

Research Methods: In the research process (beginning, end) the questionnaire method was used to study the attitudes of elective students to the formation of healthy thinking and self-care thinking. "No" or "don't know" answers are required. The "zero hypothesis" and x^2 criterion were used for statistical analysis of the responses of the individual questionnaire series consisting of four options [7]. Admittedly, the specialized literature contains the xi square table and formula for only two categories. According to the essence of the research, the xi square table and formula were modified for statistical analysis of the answers of the three categories (Yes, No, I do not know) of the questionnaire series.

The zero hypotheses is actually an event that assumes that there is no difference between the two observed events i.e. the survey results recorded at the beginning and end of the study, but is true until the feedback (existence of a difference) is proved. The main task of modern science is to scientifically prove the invalidity of the zero hypothesis, that is, to determine the reliable relationship between two events (elective course students n=72 at the beginning of the experiment and n=77 at the end of the experiment) and events. Mathematical operations performed in the requirements of science can only refute the hypothesis (N_0) based on assumptions, with its specific conditions.

In many cases, there are assumptions that there is no statistical correlation (difference) between the variables under study, and no difference in distribution parameters between two or more selections. The N_0 sign is used to express the **zero hypothesis**. In statistical inference, the researcher N_0 performs a sequence of actions depending on the invalidity of the hypothesis, inconsistency with the available empirical data, i.e., rejection of the hypothesis. In other words N_0 - an alternative hypothesis that rejects the H_1 hypothesis must be accepted.

When comparing the results in percentage (%) before (after) any pedagogical effect, the x^2 **criterion** was used by the researcher to determine if there was any difference between the choices, which was noticeable at first glance. In particular, in order to prove the effectiveness of the pedagogical impact of theoretical and practical training conducted during the elective course, as well as the positive change in the attitude of students to the health of the experimental group, it is necessary to determine the trend of statistically significant change. A number of differentiation criteria can be applied in the study of similar pedagogical situations. The x^2 criteria are considered in the following order.

There are different categories in the content of the questionnaire (for example, "YES"; "NO", "I DON'T KNOW"). Based on all the answers recorded at the beginning and end of the experiment, a modified table was formed (example: 1 - see table).

Table 1

General calculation table according to the x^2 criteria of the survey options

Experimental groups	Category №1 "YES"	Category №2 "NO"	Category №2 "I don't know"	Summary of answers
At the beginning of the experiment n_1=72	1300	2152	652	1300+2152+652 = 4104 (n_1)
At the end of the experiment n_2=77	3531	553	305	3531+553+305 = 4389 (n_2)
Total:	1300+3531	2152+553	652+305	$n_1 + n_2$=N

To test this statistical hypothesis, we first determine the level of significance by comparing the empirical value with the (α) critical value. In pedagogical research, the value of (α) is limited to 0.05. Second, reliability is the difference or difference. In our case **1 - (α)** 0.05 = 0.95 (i.e. 95% confidence level).

The critical value of x_i^2 is $\alpha = 0,05$ given (see Table 2).

Table 2

The critical value x_i^2 of when $\alpha = 0,05$

M □ 1	1	2	3	4	5
x_i^2	3,84	5,99	7,81	9,49	11,07

The "xi square" table of the survey results was calculated empirically with a probability of 95% based on the following formula (in Excel).

$$X^2_{emp} = \frac{N(B_{t.b.} \cdot K_{t.o.} - K_{t.b.} \cdot B_{t.o.} - K_{t.b.} \cdot C_{t.o.} - C_{t.b.} \cdot K_{t.o.} - \frac{N}{3})^2}{m \cdot n \cdot (B_{t.b.} + B_{t.o.}) \cdot (K_{t.b.} + K_{t.o.}) \cdot (C_{t.b.} + C_{t.o.})}$$

Here, m - the number of students at the beginning of the experiment, n - the number of students at the end of the experiment, total, $N = m + n$, $B_{t.b.}$ - "yes" at the beginning of the experiment, $K_{t.b.}$ - "no" at the beginning of the experiment, $C_{t.b.}$ - "I do not know" at the beginning of the experiment, $B_{t.o.}$ - "yes" at the end of the experiment, $K_{t.o.}$ - "no" experience at the end, $C_{t.o.}$ - "I do not know" at the end of the experiment - were created (see Table 3).

Table 3
Student response options by questionnaire categories

Questionnaire categories		At the beginning of the experiment n = 72			At the end of the experiment n = 77			Questionnaire categories
		Yes	No	I don't know	Yes	No	I don't know	
1	m =1224	345	627	252	1075	82	152	n=1309
2	m =1080	265	727	88	821	307	27	n=1155
3	m =1008	330	458	220	932	70	76	n=1078
4	m =792	360	340	92	703	94	50	n=847
Total: 4104		1300	2152	652	3531	553	305	**Total:4389**

Research results. According to the table below, the answer options for students in the questionnaire categories are as follows: at the beginning and end of the experiment **1300 <3531 = "YES", 2152> 553 = "NO" and 652> 305 = "I DON'T KNOW"** was.

IV.Discussion

An experimental value was calculated based on the above formula to refute the initially proposed hypothesis **N0** and to accept the accepted alternative hypothesis **N1**, i.e. to prove that there is a true statistical difference between the results of the pre-experiment and post-experiment questionnaires (see Table 4).

Table 4

Comparative analysis of indicators to determine the relationship of HLC in e-course students

№	Questionnaire categories	Before the experiment (n = 72)			After the experiment (n = 77)			Critical threshold value 0.95% based on probability	Empirical value 0.95% based on probability
		"Yes"	"No"	"I don't know"	Yes"	"No"	"I don't know"		
1	Determining students' attitudes to the basics of healthy living culture (17 questions)	345	627	252	1075	82	152	5,99	6,11
2	To determine the level of formation of students' desire to engage in physical culture and sports (15 questions)	265	727	88	821	307	27	5,99	9,78
3	Assessment of students' attitudes to learning activities, motivational parameters (14 questions)	330	458	220	932	70	76	5,99	9,14
4	The culture of healthy living in the eyes of students is an "elective course" determine the attractiveness (attractiveness)	360	340	92	703	94	50		

	(11 questions)							5,99	6,15
Total:		1300	2152	652	3531	553	305	5,99	7,09

In the experiment, since **M = 3,** from Table **3.3** - **M-1 = 2**, and we obtain the corresponding $X_{0,05}^2 = 5,99$ critical value. $X_{emp}^2 \geq X_{0,05}^2$ was right. According to the data in Table 4, there is a reliable difference at the end of the experiment between the response categories, critical and empirical values for all questionnaire categories. The empirical (7.09) value of the general questionnaire series is greater than the critical (5.99) value, i.e. **7.09> 5.99** (Table 4).

During the experiment, changes in the ratio and percentage between the response options of the questionnaire series were noted (see Table 5).

Table 5.

Ratio and percentage change of questionnaire categories

№	Questionnaire answer options	At the beginning of the experiment		At the end of the experiment	
		Number of answers	% change	Number of answers	% change
1	Yes	1300	34	3531	84
2	No	2152	43	553	8
3	I don't know	652	23	305	8
4	**Total**	4104		4389	

% Change in number of answers % in

Figure 5.1.

**Ratio and percentage change of questionnaire categories**
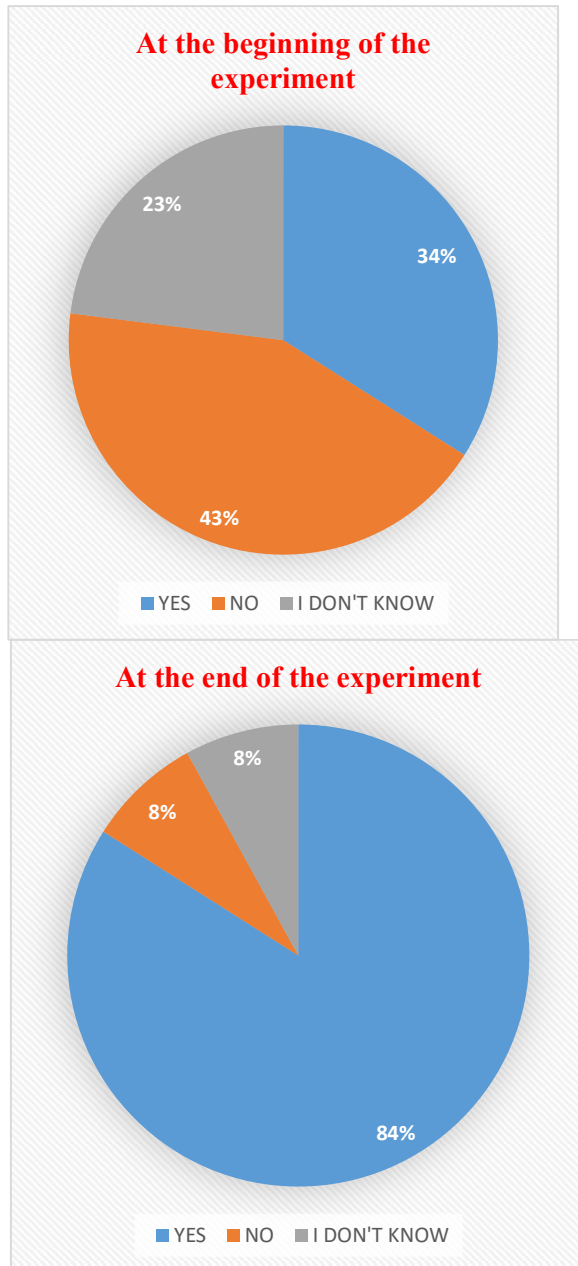
According to the results of the percentage change in the answer options of the student questionnaires: at the beginning and end of the experiment **34% <84% = "YES"** increased, **43%> 8% = "NO"** decreased and **23%> 8% = "I DON'T KNOW"** decreased; with a predominant tendency to change the positive attitudes of students towards a healthy lifestyle (see Figure 5.1).

Hence, the electronic resources used in the elective course process: with the effectiveness of theoretical and practical-methodical lessons, students show positive changes in their culture of healthy living, which makes it possible to accept H_1 hypotheses (see Figure 5.2).

Figure 5.2
The dynamics of positive changes in their attitudes toward HLC in e-course students
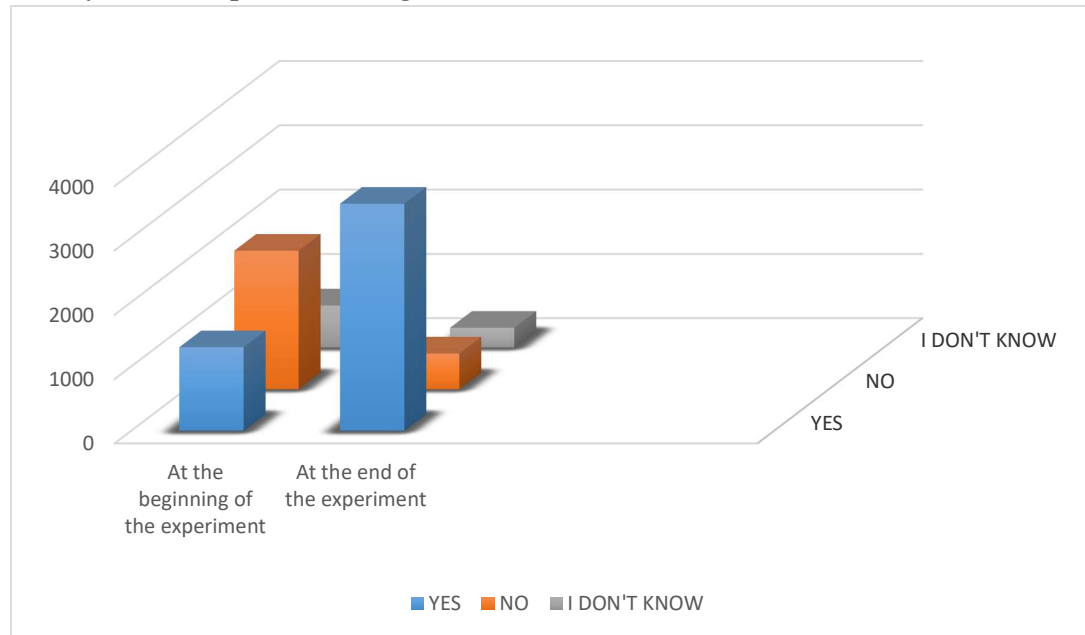
V.Conclusion

As a result of the study of the effectiveness of the elective course HLC on the subject of Turan wrestling and its teaching methods, statistical analysis of individual answer options received from students on the questionnaire series:

- Empirical (6.11) value at the end of the experiment of answer options on 17 questions to determine the attitude of students to the basics of healthy living culture;
- Empirical (9.78) value at the end of the experiment of answer options on 15 questions to determine the level of formation of the desire of students to engage in physical culture and sports;
- Empirical (9, 14) value at the end of the experiment of the answer options on 14 questions to assess the attitude of students to learning activities, motivational parameters;
- At the end of the experiment, the answers to 11 questions on determining the attractiveness (interest) of the "Elective Course" Healthy Living Culture in the eyes of students were confirmed to be a reliable difference from the critical value with empirical (6.15).

It can be seen from these tables that the empirical indicators for all of the above survey options are greater than their accepted critical value. Hence, from the hypotheses put forward: (N0) hypothesis is rejected, (N1) is an alternative (alternative) hypothesis, i.e. the statistical difference between the results of the pre-experiment and post-experiment questionnaires has

been proved. The research conducted in the e-course group demonstrates the effectiveness and the formation of a positive attitude of students towards HLC.

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