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Olena H. Kuzminska
Doctor of Pedagogical Sciences, Professor, Professor at Information Systems and Technologies Department
National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine
ORCID ID 0000-0002-8849-9648
o.kuzminska@nubip.edu.ua

Mariia S. Mazorchuk
PhD in Technical Sciences, Methodist of Research and Analytics department
Ukrainian Center for Education Quality Assessment, Kyiv, Ukraine
ORCID ID 0000-0002-4416-8361
mariia.mazorchuk@karazin.ua

Olena M. Vasilyuk
graduate student, Department of Innovative Technologies in Pedagogy, Psychology and Social Work
Alfred Nobel University, Dnipro, Ukraine
ORCID ID 0000-0003-1821-347X
o.m.vasyliuk2021@gmail.com

STUDENTS' PERCEPTION OF PLAGIARISM: CASE STUDY OF ACADEMIC INTEGRITY FORMATION

Abstract. The issue of maintaining academic integrity and preventing plagiarism is in the focus of attention of higher education institutions. The consideration of these issues have been actualized under the conditions of Covid-19, because with the transition to a distance form of education, the temptation of dishonest use of data from the Internet by students has increased. Higher education institutions are developing various strategies to prevent plagiarism in student works. This study presents an example of the formation of academic integrity during graduate studies at the National University of Life and Environmental Sciences of Ukraine. The need has been updated and the methodology for applying an educational approach (a distinction is made between educational and educational approaches) to the use of text-matching software (the Unicheck plagiarism detection tool built into the LMS Moodle has been used) for preventing plagiarism in student papers has been developed. During the approbation of the developed methodology in the process of studying the discipline of the students' choice "Scientific communication in graduate research", a positive correlation has been found between the pedagogical intervention and students' understanding of ethical academic practice. As a result of the survey of 146 graduate students (80 students from the intervention group and 64 students from the control group), the effectiveness of the application of the author's method has been proven: a significant difference has been determined between the point marks regarding students' confidence in preventing plagiarism and their practical confirmation among students who worked according to the author's method (the intervention group, indicators are significantly higher) and those who were trained using the educational approach (informing according to the policies and procedures determined by the university). It is suggested that the use of a combination of enlightening and educational approaches based on which pedagogical support for the independent use of text-matching software in the process of studying individual disciplines or modules is based on a change in the attitude of students to the use of a software tool for detecting plagiarism from an evaluation tool in favor of receiving feedback, which can help higher education institutions improve academic integrity.

Keywords: students' perception of plagiarism; plagiarism detection; Unicheck; academic integrity; higher education.

1. INTRODUCTION

Statement problem. Modern information about academic integrity emphasizes the need for an institutional approach to ensure the responsibility of administration representatives, teachers and students for the formation of academic integrity and the

introduction of academic punishments for its violation. The issue of academic integrity of students is actualized under the conditions of Covid-19, since the results of research, in particular, by American [1] and Spanish [2] scientists, are the basis for increased attention to maintaining the academic integrity of the subjects in the educational process under the conditions of distance learning - students find greater academic dishonesty in online learning.

Different countries and universities have developed different policies and procedures for observing academic integrity and preventing plagiarism [3], [4]. At most foreign universities, the level of academic integrity, in particular plagiarism, is the subject of monitoring throughout the studies, and the means of academic punishment vary from the annulment of the results of individual work to the expulsion of students from the university [5], [6]. At domestic higher education institutions, the plagiarism prevention policy (for example, https://nubip.edu.ua/node/2969/24) is mostly focused on general information of teachers and students about the provisions of academic integrity and checking for plagiarism only scientific and educational and methodological works. As for students, as a rule, qualifying works are subject to inspection: master's [7] and bachelor's degree projects. At the same time, joint projects are being developed to apply the experience of different countries to develop and implement a plan of activities, the content of which consists in the orientation and training of students, teachers and representatives of the administration of higher education institutions on the practical value and importance of academic integrity, providing resources and an action plan for their close involvement in strengthening academic integrity in the educational environment. One of these projects is the Strengthening Academic Integrity in Ukraine Project – SAIUP [8], within the framework of which methodological recommendations, online resources and trainings have been developed, as well as numerous monitoring studies on compliance with the principles of academic integrity at higher education institutions of Ukraine have been conducted. As a result, which corresponds to similar foreign studies [4], the formation of institutional policy and the development of an environment that supports integrity are included among the main factors influencing the formation of academic integrity of students. At the same time, although there is a positive correlation between pedagogical support (we distinguish enlightening and educational approaches) and students' perceived compliance with the provisions of academic integrity, researchers determine the limitations of using only the educational approach [9]. Understanding that the relevant knowledge, skills and attitudes of students are acquired through practical experience comprehensively considered in a conducive learning environment, the subject of scientific discussions is the determination of the impact of various policies and practices, in particular, the use of text matching software to detect plagiarism (the focus of this study) on the formation academic integrity of students [6], [10]. In search of an answer to this question, our (local) research should answer the following research question: How to change students' perception of plagiarism with the help of the educational approach?

Analysis of the recent research and publications. Based on the analysis of analytical data [11] and the local research results [1], [12], [13], the main reasons for the presence of plagiarism in students' works include: the availability of the Internet and digital sources and technologies; laziness; low academic self-esteem and reputation; limited knowledge citation and paraphrasing, impunity, lack of time, language problems, complexity and a significant amount of tasks offered by the teacher. Therefore, there are deliberate plagiarism [14], when a student realizes that an academic work includes content that is not cited or cited properly and presents it as an original work [15], and unintentional plagiarism, which usually occurs due to a lack of knowledge about citing the works of others [1], [16].

At the same time, we agree with A. Mphahlele [17] that the use of textual borrowing detection software at the institutional level only as a control tool reduces its educational potential for student development and can lead to negative consequences.

Certain examples of the use of plagiarism detection software (Turnitin as the example [18]) as an educational tool to prevent plagiarism and acquire academic writing skills are given in [19]. Reducing plagiarism through academic misconduct education through the development of a special program for learning English for academic purposes is proven in the study of Perkins, M., Gezgin, U.B. & Roe, J. [20].

Successful practices of combining the explanation of university policy (the enlightening approach) with the use of formative assessment of students regarding the awareness of the need to observe academic integrity and prevent plagiarism (the educational approach) are presented in [21]. The effectiveness of using text-matching software (TMS) to prevent plagiarism by students in combination with educational measures on academic integrity is also confirmed by Canadian researchers [22].

Based on the results of the study by M. Peters [23], where the need of students for additional training is determined, and also understanding that the use of TMS, as a rule, is aimed at intentional plagiarism and hardly "combats" unintentional plagiarism caused by lack of knowledge, the goal of our research is to develop a method of applying the educational approach to the use of text-matching software for preventing plagiarism in students' papers and experimentally verify its effectiveness in the process of graduate education.

The objectives of the study:

1. To develop the methods of applying an educational approach to the use of text-matching software for preventing plagiarism in student papers.
2. To experimentally verify the effectiveness of the proposed methods in the process of teaching graduate students of Ukrainian higher education institutions.

2. RESEARCH METHODOLOGY

The primary basis of our research is methodological foundations of modeling of business processes [24] and pedagogical design – we use the methods of applying the educational approach to the use of text-matching software for preventing plagiarism in students' papers (*the first research task*) and applying the case study method and a sample survey [25] to determine the effectiveness of the proposed methods (*the second research task*).

In the process of implementing the first task, based on the analysis of studies related to our research [6], [16], [22], we have considered various options for implementing the educational approach to the formation of academic integrity of students. In particular, the use of additional guides to prevent plagiarism, e-content recommendations (mass open online courses, recordings of thematic webinars, scientific publications, etc.), conducting additional training (introducing an additional module into existing courses), performing practical tasks and various forms of student support on plagiarism prevention issues.

Since the results of the analyzed empirical studies prove the effectiveness of using text-matching software by students (during training and with pedagogical support) not only as a means of preventing the "emergence" of plagiarism, but also as an educational means of preventing plagiarism, the additional research has been aimed at determining the functionality of various text systems of text-matching software. The latter is related to the fact that foreign higher education institutions mostly use Turnitin, while most Ukrainian universities use Unicheck (https://unicheck.com/uk-ua) as an official means of detecting text matches. As a result of comparing the functionality of the specified systems (https://rigorousthemes.com/blog/unicheck-vs-turnitin-which-is-better/ , https://www.g2.com/compare/turnitin-vs-unicheck), and also due to the fact that Unicheck joined the Turnitin family in 2020, we consider it expedient to implement the experience of

implementing pedagogical intervention using Turnitin at foreign universities to the educational practice of plagiarism prevention using Unicheck at Ukrainian universities.

The developed methodology was used in the study of the discipline "Scientific communication in graduate research", which was a selective for building an individual educational trajectory of graduate students at the National University of Life and Environmental Sciences of Ukraine.

With regard to the methodology of implementation of the second task of the research, namely the determination of the effectiveness of the developed method of preventing plagiarism in students' works, it should be noted that in this study we determine the impact of the method on the understanding of plagiarism and the attitude of students, and do not evaluate the level of plagiarism in students' works. For this purpose, a questionnaire was created (https://forms.gle/fz2Nq86orMSvfb3d9) and additional in-depth interviews were conducted.

The questionnaire contained three groups of Likert scale-based questions: to describe the profiles of the respondents (*section 1*), to determine the participant confidence in their understanding of referencing, plagiarism and use of the bibliography (*section 2*), an ability to correct scientific writing (*section 3*). The reliability of the internal consistency of the questions of the proposed questionnaire has been confirmed by calculations of Cronbach's alpha coefficient [25].

The participants of this stage of the research were 1st-year master's degree students of the National University of Life and Environmental Sciences of Ukraine majoring in the following specialties: information technologies, social and behavioral sciences, food technologies, water biological resources and aquaculture, electrical power engineering, electrical engineering and electro mechanics. All the students had experience in checking their own bachelor's papers for plagiarism. However, the inspection was carried out by representatives of the administration – students did not work with the Unicheck system, did not have access to reports, and were only informed of the results of the inspection. The procedures for checking works for plagiarism and the provisions of the academic integrity policy are provided in the relevant regulatory documents and posted on the official website of the university and relevant faculties (for example, https://nubip.edu.ua/node/2969/24). The latter ensures the implementation of the educational approach at the level of the educational institution.

As a result, we received answers from 146 graduate students. Two independent samples were analyzed: those who took the course "Scientific communication in graduate research" (80 students (54.8%), *group I*) and those who did not (66 students (45.2%), *group II*). The number of female respondents who took part in the survey was 53 people (36.3%), the number of male respondents was 93 (63.7%), which corresponds to the distribution of the entire population of graduate students by gender in the relevant specialities. Therefore, the number of graduate students is sufficient for the formation of conclusions regarding individual areas of assessment, the error of representativeness does not exceed 5%.

The main hypothesis was that the intervention group (*group I*) would have more developed knowledge, skills and attitudes about academic integrity in terms of plagiarism prevention at the end of the first year of master's degree studies than the control group (*group II*).

To determine the effectiveness of the proposed methodology as realization of the educational approach, the following partial hypotheses were formed:

H1: The application of the educational approach at the level of an educational institution has a positive effect on the awareness and attitude of students towards plagiarism as a type of academic dishonesty: students of the intervention and control groups are aware of the relevant provisions;

H2: The application of the author's method of using text-matching software Unicheck for preventing plagiarism in students' papers (educational approach) in the process of teaching certain disciplines (modules) contributes to the pedagogical transformation of assessing the presence of plagiarism in students' works into a formative assessment of the level of academic integrity of students: intervention students groups have a higher level of confidence in the honest writing of academic texts and confirm this in practice.

To confirm or refute the proposed hypotheses, the respondents were offered:

- to indicate the availability of their own experience in carrying out scientific activities in general, and checking works for the presence of textual overlaps, in particular, as well as evaluating their own awareness of academic integrity issues (section 1 of the questionnaire, testing hypothesis *H1*);
- to determine the level of confidence in plagiarism prevention (7 closed-ended questions in section 2 of the questionnaire, which were proposed as a self-assessment of knowledge and experience) and confirm in practice through the implementation of mini-cases (9 questions in section 3 of the questionnaire); the analysis of the consistency of students' answers to questions in section 1 and section 2 of the questionnaire will allow testing hypothesis *H2*.

In order to determine the factors influencing the formation of knowledge, skills and attitudes regarding the observance of academic integrity in terms of plagiarism prevention, additional in-depth interviews were conducted with students who were trained according to the author's method (group I) and showed high results. However, the in-depth interview questions were included as an additional dependent measure to determine whether training in the developed methodology had had an effect on participants' perceptions of plagiarism. Since these questions were exploratory, no specific hypotheses were proposed.

In the course of the data analysis, a set of methods and models was used, allowing to calculate all descriptive statistics. The choice of certain indicators and criteria for evaluation was determined by the type of data, the evaluation scale, and the limitations of the methods. SPSS statistical data processing software [26], [27] was used for calculations.

3. RESULTS OF THE RESEARCH

3.1. The methods of applying the educational approach to the use of text-matching software for preventing plagiarism in students' papers

To implement the author's methodology (*technical implementation*), the Unicheck Plagiarism Checker Plugin (https://moodle.org/plugins/plagiarism_unicheck) module was built into the Moodle system. This module was created by a Ukrainian company, a product developer, to check texts for incorrect borrowings.

The plagiarism check procedure takes place on Unicheck resources, and the module built into Moodle connects the work submitted by the student and the results of its check on unicheck.com. This module allows users to check students' work in assignment modules, seminars, essay-type test questions, and forum posts.

The module is installed by the Moodle system administrator, and its use does not require additional settings or other actions by the teacher of a specific e-learning course. The teacher only needs to mark which resources (tasks for students) need such a check.

When a student uploads the results of a given task to an electronic course hosted on the Moodle platform, the corresponding file is immediately sent for review. Unicheck scans multiple web sources indexed by Yahoo and Bing in real-time for accurate verification results. Also, the system finds matches in the database of submitted students' works of this

course, which allows to fix write-offs. In addition, Unicheck can detect other options for dishonesty, for example, replacing symbols with similar ones from other alphabets.

Quantitative results of Unicheck's work are presented in the percentage of adoptions found, qualitative results are given in the format of a PDF file containing a detailed report. These results are available to both teachers and students. Moreover, in case of "suspicion" of the presence of fraudulent actions, the system will display an appropriate warning next to the corresponding file (Fig. 1).

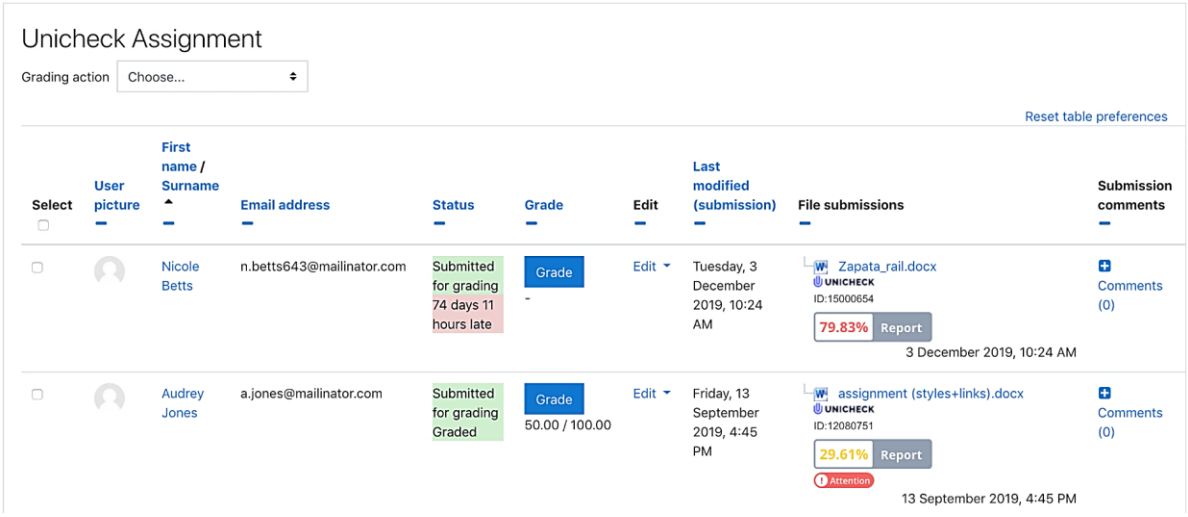

Fig. 1. Example of presenting the results of a plagiarism check in a Moodle task

In the process of studying the discipline "Scientific communication in graduate research", individual works that students uploaded for verification into the system were checked by Unicheck for text matches (https://support.unicheck.com/hc/en-us/articles/360016436734-Student-s-Guide). When submitting the first work (an essay on a given topic), based on the results of the review, students were allowed to change (edit) and re-send it to the system for review before the deadline for accepting the work. In order to study the issues of plagiarism prevention and academic integrity further, students were offered as independent work to carry out a targeted search and study using certain MOOCs. These include, for example, https://mooc.uit.no/courses/course-v1:UiT+Plagiarism+English/about, https://www.plagiarism.org/plagiarism-research. At the same time, it should be noted that graduate studies in general, and within the framework of this course in particular, are based on blended learning methods [28], and therefore, when selecting non-formal education resources, it is necessary to emphasize compliance with the provisions of academic integrity [29].

During the review of the subsequent work (the thesis of the presentation at the student scientific conference), the students did not have access to the originality report, but the teacher used the report (https://support.unicheck.com/hc/en-us/articles/360026050714-Instructor-s-Guide) and could, if necessary, conduct consultations or interviews with the students. Depending on the goal, consultations are aimed at improving students' knowledge and skills in preventing plagiarism, and interviews are aimed at monitoring the level of academic integrity. When checking the final work of the corresponding module, students received only the result – the percentage of textual borrowings. In case of exceeding the threshold, the specified topic was not accepted, which was reported to the students in advance. The general model of plagiarism management is presented in Fig. 2. However, the conditions regarding the number of checks, the system of fines and counseling may change

depending on the readiness and competence of the students, technical and financial support from the educational institution (the Unicheck system is paid).

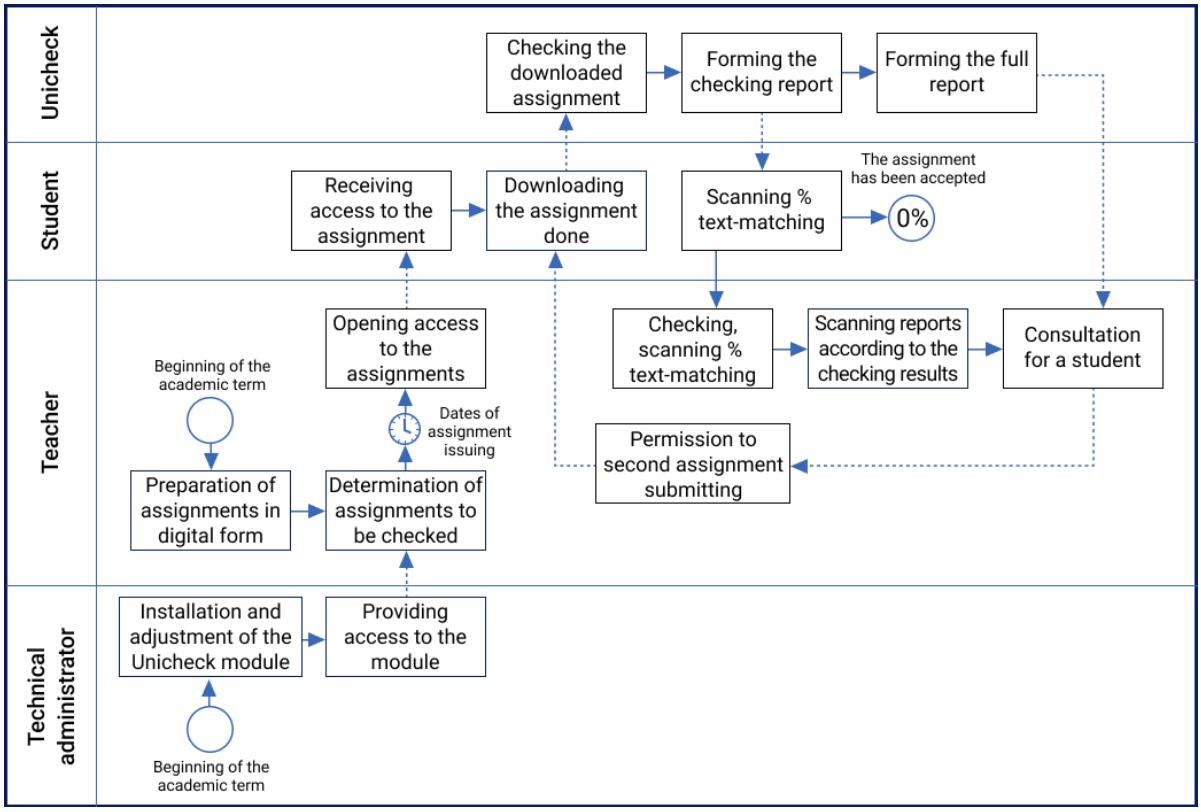

Fig. 2. The process organization of checking works for plagiarism

3.2. Experimental verification of the effectiveness of the proposed methods

According to the results of the answers to the questions from the developed questionnaire, namely: "Indicate whether you have had experience in a scientific activity and publication of its results, including that one through the means of scientific communication" (section 1 of the questionnaire), the majority of students answered that they did not have such experience - 73 students (50%); 65 students (44.5%) had such experience as part of master's degree studies; 8 students (5.5%) answered that it was a part of their work. That is, the half of the students have had no experience of a scientific activity and publication of its results, and the half of the students have already encountered scientific research and have an idea of the means of scientific communication. This data does not depend on whether the students belonged to the control or intervention groups.

Among the 146 respondents, 60 students (41.1%) had the experience of checking their own works for plagiarism, but only within the scope of education without their own participation; 38 students (26%) checked their own works independently; 35 students (24%) answered that they had no experience, but were familiar with the work of text matching detection systems and only 13 students (8.9%) had never had experience with plagiarism checking and were not knowledgeable about this issue. That is, most students have information about checking works for plagiarism.

To the question "Does your university have developed regulations on compliance with academic integrity?" 107 students (73.3%) answered positively, 37 (25.3%) could not answer, and only 2 (1.4%) claimed that such a provision did not exist at their university.

Among the respondents, more than 75% claimed that they knew what academic integrity was and the rules for its observance were (44 students (30%) answered that they understood it well and 66 students (45.2%) knew about it); 29 (19.9%) answered that they were familiar with the provisions of academic integrity, but were not sure about some concepts; 7 students (4.8%) did not know at all, or only heard about it. That is, most graduate students have been aware of academic integrity. Since the answers to these questions do not differ in groups I and II, hypothesis *H1* can be accepted completely.

Analyzing the answers to the questions from section 2, it should be noted that all students, without exception, claimed that they know what plagiarism was and understood the rules for avoiding it: 90 respondents (61.6%) were sure that they knew it well, 43 students (29.5%) knew about it, 13 students (8.9%) knew about it, but were not sure about some concepts.

As for abstracting and the rules for its correct implementation, only 33 students (22.6%) understood it well, 48 students (32.9%) knew about it, 39 students (26.7%) knew about it, but were not sure about some concepts, 26 students (17.8%) did not know at all or only heard about it, that was almost a fifth of the respondents.

There was a similar distribution of answers to questions about knowledge of what a bibliography was and what the rules of correct description were: 40 students (27.4%) were sure that they understood it well, 60 students (41.1%) knew about it, 33 students (22.6%) knew about it, but were not sure in some concepts, 13 students (8.9%) claimed that they did not know about it, but most of them heard about it.

All students' answers have been ranked and a total score has been obtained, the distribution of which gives an idea of the general tendency of students' self-evaluation. Figure 3 shows a diagram of this distribution.

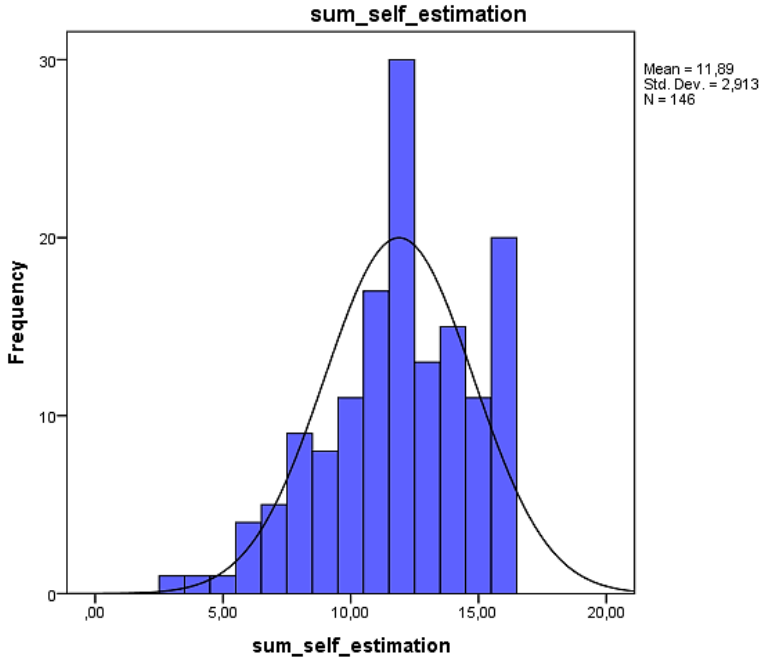

Fig. 3. Distribution of total self-estimation score for questions on determining the level of confidence in the prevention of plagiarism in students' works

As can be seen from the figure, we have a left-sided asymmetric distribution in which the modal value and the median exceed the mean, which suggests that the majority have rated their knowledge at a high level. Therefore, based on the results of the self-assessment, it can be concluded that the majority of students are confident in their knowledge of academic integrity, understand what plagiarism is (it can also be the result of applying an educational

approach at the level of an educational institution), but with certain narrower directions and rules for the correct description of the bibliography and have not encountered the correct implementation of abstracting or are not confident in their knowledge.

Section 3 of the questionnaire is practical mini-cases, these are competency test questions in the format of MCQ questions with one correct answer. The distribution of total points for 9 questions is close to normal, but not confirmed by the Kolmagorov-Smirnov criterion. Figure 4 shows a diagram of the distribution. The mean, median, and mode of the distribution range from 4 to 5 points, with a standard deviation of 2.63. In the distribution of points for questions in section 2 of the questionnairy there is a left-sided asymmetry too. Such characteristics of distributions have become the reason for choosing only non-parametric criteria for further analysis.

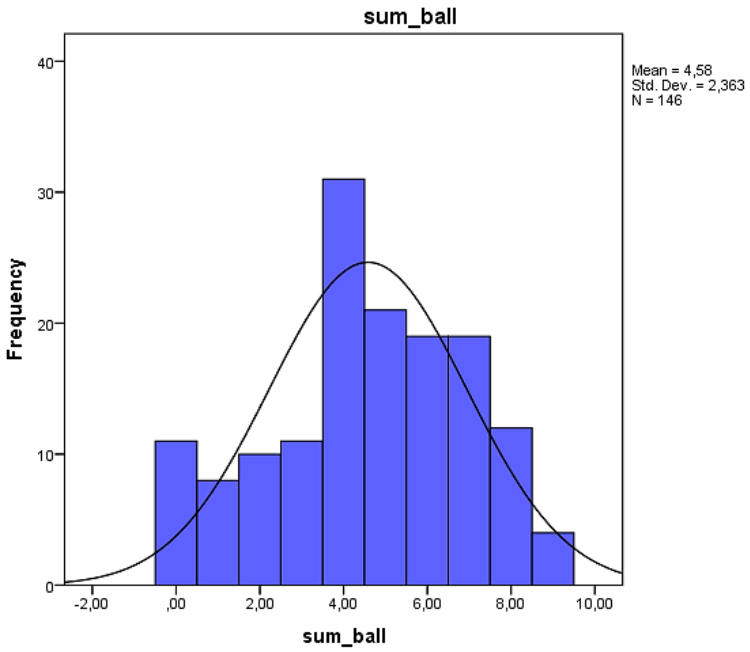

Fig. 4. Distribution of total score by answers to competence questions (mini-cases)

After comparing the distribution of scores for section 2 and section 3 of the questionnaire, we have seen that there is almost no correlation between them (Spearman's correlation coefficient is 0.19 at the significance level of p-value<0.05). Figure 5 shows a scatterplot showing that the distribution of total scores is evenly distributed with respect to scores for questions on students' self-reported confidence in preventing plagiarism. This indicates that the level of students' confidence in their knowledge and skills is somewhat overestimated or that most students have underestimated their abilities and skills. But on the scatter plot, we can see that the scores of students in the intervention group (group I) are higher. Therefore, there is reason to assume that the difference between the groups exists and is significant.

For further analysis, the median test and the Mann-Whitney test were chosen to compare the total scores by groups (intervention and control groups). The median test allows us to test whether two (or more) independent groups differ in central tendency. The Mann-Whitney test is also used to compare differences between two independent groups when the dependent variable is either ordinal or continuous but not normally distributed, as in our case. But this test also allows us to draw different conclusions about the data depending on the assumptions made about the distribution of the data.

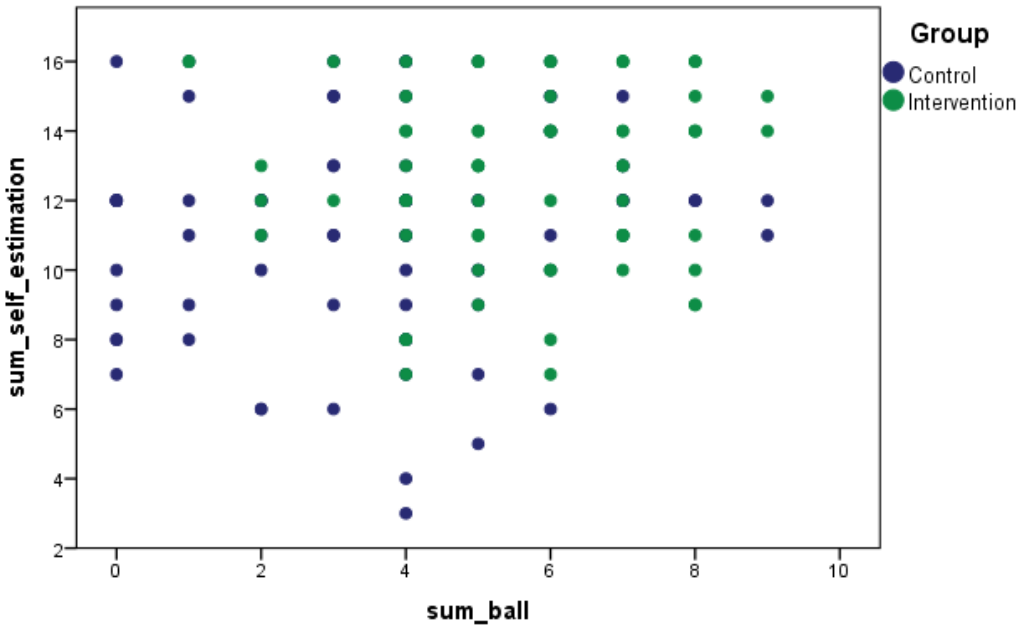

Fig. 5. Scatter plot of the correspondence of self-estimation score by level of confidence on issues of plagiarism prevention and score of implementation of mini cases

No difference has been found between boys and girls in scores regarding confidence in preventing plagiarism and their practical confirmation (implementation of mini-cases). The comparison of total scores by groups of students who have had the experience of checking their own work for students of both groups (intervention and control groups) is also insignificant (the median test and the Mann-Whitney test are not significant at the p-value level >0.05). But there is a significant difference between the self-estimation scores regarding students' confidence in preventing plagiarism and their practical confirmation in those groups of students who have had experience in a scientific activity and their scientific activity is a component of their work, and those who have not had such experience. So, in Figure 6 we can see this significant difference in medians (for self-estimation scores significance level is 0.003, for median test statistics is 11.96, and for case scores significance level is 0.006, for median test statistics is 10.345).

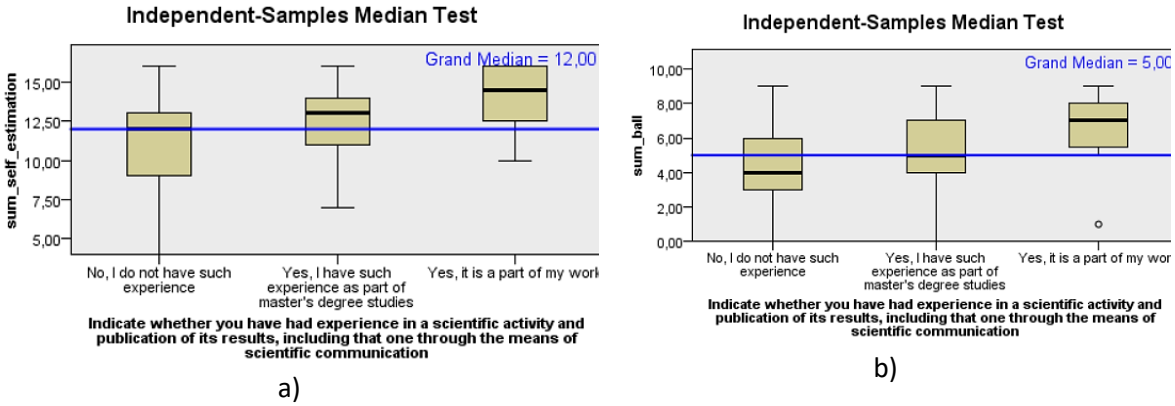

Fig. 6. The difference in students' confidence self-estimation scores regarding the prevention of plagiarism and its practical confirmation for groups of students who have had (a) and have not had (b) experience in a scientific activity

If we compare the students' self-esteem regarding confidence, the students of the intervention group have better results than the students of the control group (significance level at the level of <0.05) (Fig. 7).

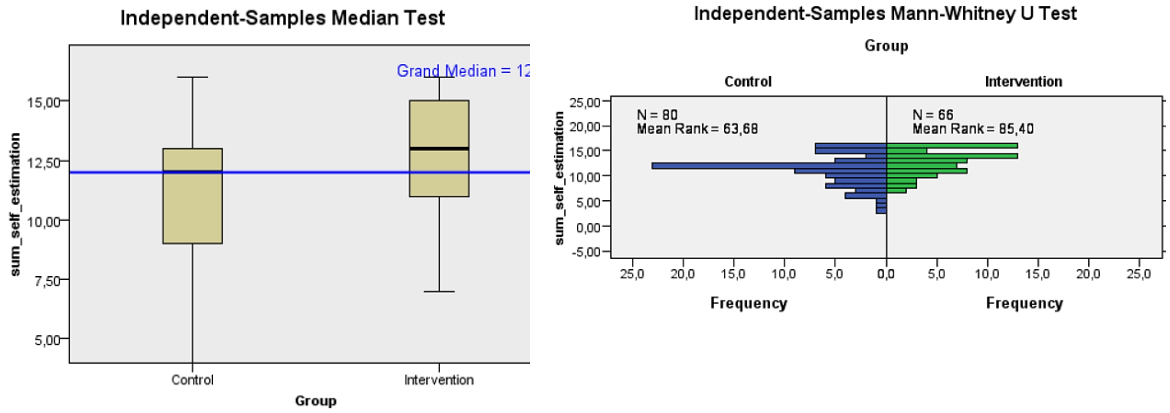

Fig. 7. The difference of the total self-estimation scores regarding confidence in the prevention of plagiarism between the intervention and control groups of students

There is also a difference in scores for certain groups of students based on the results of performing competence tasks (realization of many cases). According to the median test and the Manny-Whitney test, the difference is statistically significant – both the medians (test statistics is 14.73 at the level of p-value = 0.00) and the distributions of total scores (test statistics is 3425 at the level of p-value = 0.002) differ) (Fig. 8).

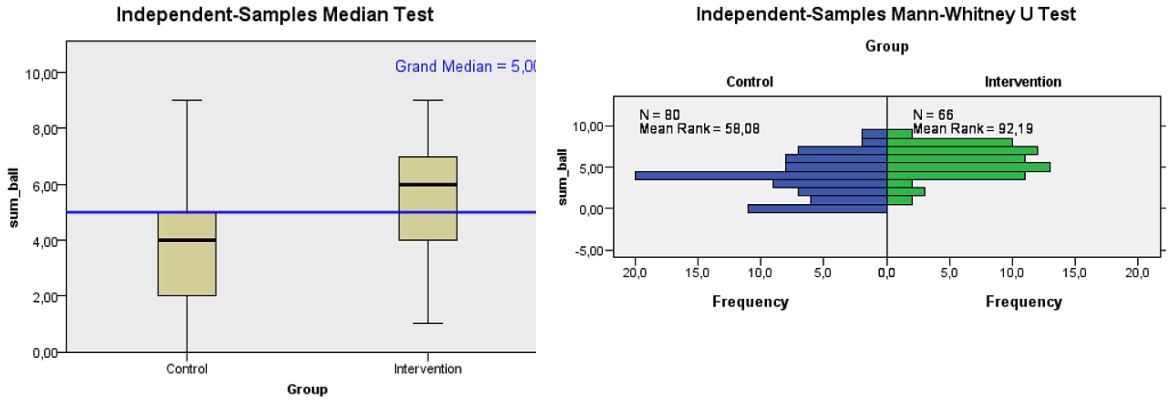

Fig. 8. The difference in the total scores based on the results of the competence tasks between the intervention and control groups of students

If we consider the relationship between point marks and the results of self-assessment of students' confidence in preventing plagiarism (section 2) and their performance of competence tasks (section 3), then in different groups it is possible to observe the absence of correlation, but in the group of graduate students who have been trained according to the author's methodology and rated themselves higher than 50% of students, and who received points on case questions on average higher than 50% of students (a total of 32 such graduate students), there is a correlation dependence of grades at the level of 0.3, which also indicates that most students of this group underestimated their level of knowledge and skills.

But, if we draw general conclusions, then training according to the author's methodology has provided the significant increase in the level of awareness, because the overall grades on the case questions are statistically higher for those graduate students who have undergone such training. The latter is the basis for confirming hypothesis *H2*.

To identify the influencing factors on the formation of knowledge, skills and attitudes regarding the observance of academic integrity in the prevention of plagiarism of the intervention group of graduate students, i.e. those who have trained according to the author's methodology, rated their level of knowledge sufficiently high and received high marks for

solving competency tasks (32 students), additional questions were asked to determine the reasons for obtaining higher results. Thus, Figures 9 and 10 show the results of the student survey on the identification of influencing factors on the formation of understanding of the main concepts of academic integrity, as well as due to which this understanding increased.

As we can see from Figure 9, it is the author's method of conducting specialized training within the framework of studying a specific discipline in combination with the use of the built-in learning management system module for checking works for the presence of text matches that has the greatest effect. This is confirmation of the effectiveness of the developed methodology.

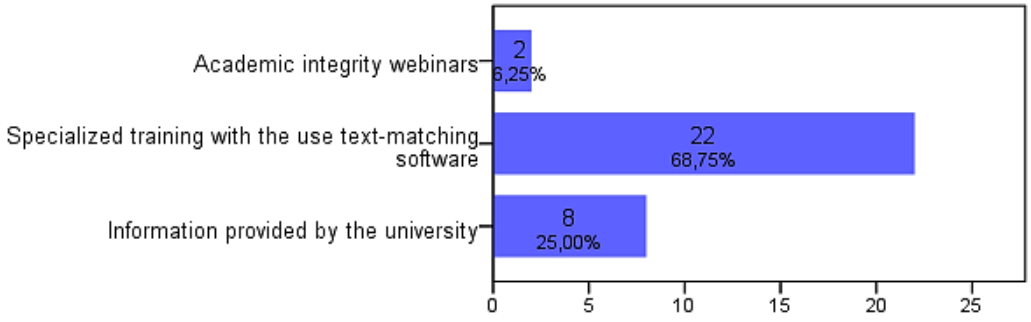

Fig. 9. Factors influencing the understanding of the main concepts of compliance with academic integrity

At the same time, the decrease in confidence (Fig. 10) indicates that students understand the complexity and importance of observing academic integrity, which can also testify to the benefit of using an educational approach to the formation of academic integrity of graduate students. Among the reasons for the decrease in confidence (as determined by the results of in-depth interviews), graduate students include the need for greater involvement in real scientific communication, since during the study of the specified discipline, issues of repeated publication, self-citation, copyright, etc. have been considered, but in each specific case their implementation may be slightly different. The latter depends on the editors of scientific publications or conference organizers.

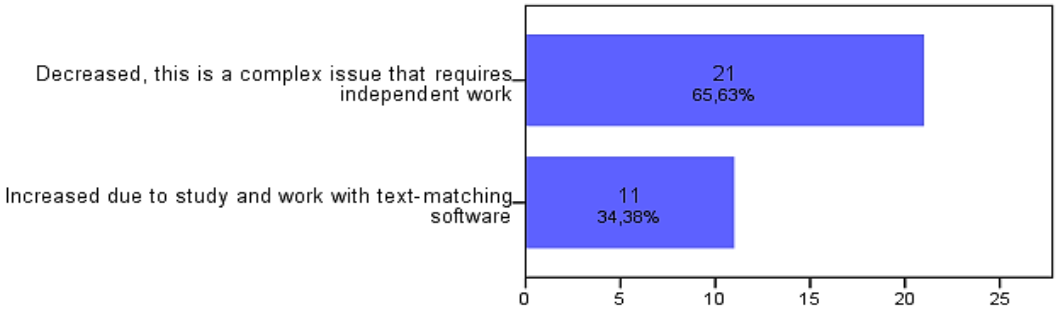

Fig. 10. Increased or decreased confidence in understanding the core concepts of academic integrity

4. CONCLUSIONS

Although higher education institutions develop academic integrity policies and procedures, including checking papers for plagiarism, students' lack of relevant knowledge and skills combined with impunity contribute to the prevalence of plagiarism in students'

papers. Therefore, the need to apply the educational approach, which involves the active involvement of students in the practice of academic integrity, in particular, in matters of plagiarism prevention, along with the enlightening approach, is actualized.

On the other hand, the analysis of empirical studies actualizes the need to develop methods for using text-matching software not as a "plagiarism detection" tool, but as an auxiliary means of monitoring and self-assessment of compliance with the provisions of academic integrity. The answer to such requests is the development of the methods of applying an educational approach (carried out during the study of the discipline "Scientific communications in graduate research") to the use of text-matching software for preventing plagiarism in student papers.

To implement the author's methodology, text-matching software Unicheck has been built into the corresponding electronic course in LMS Moodle and access parameters for checking individual works of students have been configured. The pedagogic design involved teaching graduate students honest academic writing using Unicheck in conjunction with teacher consultation and the use of non-formal education resources.

The results of the survey of students of the intervention (students used the author's method) and control groups, which was conducted as part of a pedagogical experiment at the National University of Life and Environmental Sciences of Ukraine, have confirmed the effectiveness of the developed method of preventing plagiarism in students' works (in this study, we determine the effect of the method on the understanding of plagiarism and the attitude of students, we do not assess the level of plagiarism in students' works) and is the basis for formulating the following conclusions:

- the decrease in students' confidence in understanding the main concepts of academic integrity after learning with the application of the author's method may indicate a sufficiently general presentation of these concepts when only the enlightening approach is used: students who are not involved in real practice have a slightly higher level of confidence, which has no practical confirmation;
- the combination of enlightening (informing on official institutional resources, implementation of policies and procedures, and separate thematic sessions) and educational (specialized practical training within the educational module (discipline) using Unicheck software to detect plagiarism) approaches has the maximum effect on building a virtuous environment;
- involvement of students in a scientific activity in general and publication of its results in particular increases the level of academic integrity, but also contributes to the recognition by graduate students of the fact that checking for plagiarism is not a formal procedure and requires more careful work both with their materials and studying the policies of specific publishers or conference organizers.

The prospects for further research should include the development of methodological recommendations for the use of text-matching software for the implementation of virtuous teaching and learning strategies. At the same time, taking into account the limitations of this research (text-matching software Unicheck is paid), the application of universal design, in particular, regarding the use of various text-matching software and their application models, to the development of relevant educational modules, is promising. In addition, for the realization of a virtuous educational environment of an educational institution, it is important to determine the readiness (of teachers, representatives of the administration, technical support) and constantly monitor and effectively manage changes.

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СПРИЙНЯТТЯ СТУДЕНТАМИ ПЛАГІАТУ: ПРИКЛАД ФОРМУВАННЯ АКАДЕМІЧНОЇ ДОБРОЧЕСНОСТІ

Кузьмінська Олена Геронтіївна
доктор педагогічних наук, професор, професорка кафедри інформаційних систем і технологій
Національний університет біоресурсів і природокористування України, м. Київ, Україна
ORCID ID 0000-0002-8849-9648
o.kuzminska@nubip.edu.ua

Мазорчук Марія Сергіївна
кандидат технічних наук, доцент, методистка відділу досліджень та аналітики
Український центр оцінювання якості освіти, м. Київ, Україна
ORCID ID 0000-0002-4416-8361
mariia.mazorchuk@karazin.ua

Василюк Олена Михайлівна
аспірантка кафедри інноваційних технологій з педагогіки, психології та соціальної роботи
ВНЗ «Університет імені Альфреда Нобеля», м. Дніпро, Україна
ORCID ID 0000-0003-1821-347X
o.m.vasyliuk2021@gmail.com

Анотація. Питання підтримки академічної доброчесності та запобігання плагіату у фокусі уваги закладів вищої освіти. Розгляд цих питань актуалізується в умовах Covid-19, оскільки з переходом на дистанційну форму навчання збільшується спокуса недоброчесного використання студентами даних з Інтернету. Заклади вищої освіти розробляють різні стратегії запобігання плагіату у студентських роботах. У даному дослідженні представлено приклад формування академічної доброчесності під час навчання магістрів у НУБіП України. Актуалізовано потребу та розроблено методику застосування освітнього підходу

до використання програмного забезпечення зіставлення тексту (використовували вбудований в LMS Moodle програмний засіб виявлення плагіату Unicheck) для запобігання появи плагіату в роботах студентів. Під час апробації розробленої методики під час вивчення дисципліни за вибором студентів «Наукові комунікації у дослідженнях магістрів» виявлено позитивну кореляцію між педагогічним втручанням (розрізняємо просвітницький та освітній підходи) та розумінням студентами етики академічної практики. У результаті опитування 146 магістрів (80 з експериментальної та 64 з контрольної груп) доведено ефективність застосування авторської методики: визначено суттєву різницю між бальними оцінками впевненості студентів щодо запобігання плагіату та їх практичним підтвердженням. У студентів, що працювали за авторською методикою (експериментальна група), показники значно вищі ніж у тих, до кого застосовувався лише просвітницький підхід (інформування відповідно до визначених університетом політик і процедур). Висловлено припущення, що використання комбінації просвітницького підходу та освітнього, в основу якого покладений педагогічний супровід самостійного використання програмного забезпечення зіставлення тексту у процесі вивчення окремих дисциплін чи модулів, сприяє зміні ставлення студентів до використання програмного засобу виявлення плагіату від інструменту оцінювання на користь одержання зворотного зв’язку, що може допомогти закладам вищої освіти поліпшити академічну доброчесність.

Ключові слова: сприйняття студентами плагіату; виявлення плагіату; Unicheck; академічна доброчесність; вища освіта.