Abstract: Plagiarism is a serious problem in the academic environment that affects academic honesty. However, there is usually a lack of knowledge regarding what kinds of practices can be regarded as plagiarism, as it is defined according to various ethical rules that differ from country to country. There is no commonly accepted definition encompassing all currently recognized forms of plagiarism. Therefore, some authors consider pedagogy to be the best measure against plagiarism. To research the impact of educating students on how to correctly quote sources on rates of plagiarism and the impact of specific factors causing plagiarism, we analyzed the measures of association among nominal variables from a dataset based on a survey of bachelor’s and master’s degree students in Slovak universities. According to our results from the Slovak universities, we can confirm that education has a positive impact on the elimination of plagiarism; however, teaching itself is not a sufficient measure to fight plagiarism. Other measures, e.g., checking seminar papers for plagiarism or making regular changes in topics for assignments, must accompany the educational measures that make an effort to eliminate plagiarism. The prevention of certain types of misconduct involves a long process; the teachers must implement educational measures and then uncompromisingly demand that students respect those measures.

Keywords: plagiarism; reasons for plagiarism; academic ethics; anti-plagiarism measures

1. Introduction

Plagiarism is usually defined as “copying (or using) of others’ work that (accidently or otherwise) deceives a third party about the authorship (or ownership) of the work” [1] (p. 199); “it is taking the words, ideas and labour of other people and giving the impression that they are your own” [2] (p. 146), or it is the act of submitting a document that belongs partially or completely to somebody else without due reference and that therefore misrepresents the effort that has been carried out by the submitting author [3].

Many other definitions of plagiarism in scientific works include the core idea that plagiarism is an appropriation of another person’s work [4,5]. This misconduct is a serious problem in the academic environment that affects academic honesty. It is “a form of academic malpractice and frames it as a breach of academic integrity” [6] (p. 291). However, this misconduct need not be intentional; it can also be accidental or unintentional [7].

Not all forms of plagiarism are a matter of legal regulations. Many types of conduct by teachers and students at universities that can be defined as plagiarism are in harmony with the law, e.g., “copying sections of material from one or more source text, supplying proper documentation (including the full reference) but leaving out quotation marks, thus giving the impression that the material has been paraphrased rather than directly quoted” [8] (p. 475), taking verbal and/or written advice from another past or current student about what to include in an assignment [9], portraying collaborative assignments
as the product an individual student’s effort, or submitting the same work for multiple courses [6]. Decisions as to what qualifies as plagiarism are regulated only by ethical rules. Firstly, ethical rules are not enforceable by the state, unlike legal norms. Secondly, there is a lack of knowledge concerning what kinds of conduct can be regarded as plagiarism, as it is defined according to various ethical rules that differ from country to country. Universities adopt their own ethical codes or affirm the common ethical rules adopted at the national level. In Europe, the European Code of Conduct for Research Integrity "serves the European research community as a framework for self-regulation across all scientific and scholarly disciplines and for all research settings" [10] (p. 3). However, there is no common definition accepted worldwide that includes all forms of plagiarism. A comprehensive and clear definition of plagiarism that includes various types of plagiarism with practical examples could help the academic community prevent plagiarism [11].

Moreover, it is necessary to mention a new phenomenon—artificial intelligence. It is too difficult to determine whether a student uses it to produce his/her projects, seminar work, or assignments. In addition, students pay less attention to properly using and quoting digital sources than conventional sources, and they use digital sources more often without granting academic acknowledgement [12,13]. What would motivate students to properly use and quote texts that are the results or products of artificial intelligence? There are three types of text plagiarism generated by artificial intelligence: verbatim, paraphrase, and idea plagiarism [14]. Do the students or even the teachers know whether submitting a text generated by artificial intelligence is plagiarism? According to the general definition, plagiarism is an appropriation of work belonging to someone else. Is the artificial intelligence “someone else”? Therefore, clear rules for what plagiarism is and education on plagiarism, including how it relates to the new phenomenon, are essential nowadays. Many authors also reject the prohibition on the use of artificial intelligence in the scientific works of students and teachers. “Ignoring or prohibiting applications like ChatGPT does not seem to be the way forward” [15] (p. 4). The expectation is that ChatGPT will evolve into an essential part of the writing process [16]. Some of individuals proposed that plagiarism detection may be needed “to shift its focus from similarity check to verifying the origin of content” [17] (p. 11). The question of education arises again in terms of the need for students to develop an “ability to use artificial intelligence and harness its power and critical thinking regarding artificial intelligence content, i.e., method used to create the result; sources used to create the result; and biases that might exist within the system” [18] (p. 1). Students need to be trained in how to employ ethics and critical thinking, and teachers need to be trained in how to ask students to demonstrate their ability to go beyond artificial-intelligence-produced writing and produce new knowledge [19].

In Slovakia, there have been many discussions on the subject of plagiarism for a long time [20] (p. 203). A comprehensive overview of the state of academic ethics in Slovakia was analyzed by Králiková [21]. The results of the research show that overall awareness of ethical issues and related public debates has risen in the past decade. There have been significant developments in the field of academic integrity in Slovakia, mainly in terms of plagiarism detection and plagiarism prevention [22]. One of the results of detecting plagiarism in the academic environment in Slovakia was the introduction of a central system for theses and dissertation collections that can be used for plagiarism detection; that system has been operating in Slovakia since 2009 [23].

However, there is a question as to whether education alone can eliminate plagiarism. There are two possible sets of measures to eliminate plagiarism. The first is a repressive set of measures, e.g., conduct defined as plagiarism will be severely punished by university management based on the decisions of ethics committees or plagiarism will be defined in the legal regulations as an undesirable social action. The consequence of this conduct would be a sanction enforceable by the state power; in contrast, under ethical rules, the consequence of a violation is usually only moral, social condemnation of such conduct. Second, there is a preventive set of measures, for example, education on paraphrasing skills and cognitive dissonance [24–26]. Many actions that can be defined as plagiarism are
committed not intentionally, but only because the student or even the teacher did not know that this is undesirable conduct that is against academic ethics. Therefore, eliminating plagiarism through pedagogy (such as offering courses on ethics, morality, and literacy) seems to be one of the best measures [27]. Other authors ask for an institutional approach, with the responsibility shared by the students, staff, and the institution [28].

The objectives of this study are to investigate whether sufficient priority is given to educating students about plagiarism at Slovak universities and, if so, whether this education is effective in discouraging students from committing plagiarism and including plagiarized content in their term papers or even theses. We investigated whether education is effective in solving the issue of plagiarism in the university environment and examined the factors that cause plagiarism.

2. Materials and Methods

2.1. Sample

In 2018, the non-governmental, non-profit organization MESA10 organized the project “TODAROZUM”, and within this project, a survey was conducted among bachelor’s and master’s degree students at Slovak universities. Information about the questionnaire results is publicly available on the project website [29]. The questionnaire also included some questions focused on plagiarism.

The sample consisted of 3611 students, comprising 2357 bachelor’s degree students and 1254 master’s degree students. A summary of the sample’s characteristics is shown in Table 1, and the categorization by field of study is provided in Table 2. Due to the low participation of part-time students, we did not distinguish between forms of education. However, we were interested in the fields of study. The questionnaire contained 17 options for students to indicate their field of study. The fields of study were then categorized into five groups, as follows:

- Technical sciences or technology (hereafter referred to as group 1)—25% of the respondents. This group includes the fields of transportation, postal services, telecommunications, electrical engineering, informatics, computer technology, mathematics, construction, geodesy, cartography, mechanical engineering, other technical sciences, military sciences, and security sciences.
- Natural and health sciences (hereafter referred to as group 2)—18% of the respondents. This group covers agricultural and veterinary sciences, natural sciences, non-medical health sciences, medical sciences, and pharmaceutical science.
- Pedagogy (hereafter referred to as group 3)—19% of the respondents. This group includes teaching, education, and pedagogical sciences.
- Economics (hereafter referred to as group 4)—12% of the respondents. This group includes economic and management sciences.
- Social sciences (hereafter referred to as group 5)—27% of the respondents. This group includes the humanities, the arts, and social sciences not otherwise categorized.

Table 1. Summary of sample characteristics.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total participants</td>
<td>3611 students</td>
</tr>
<tr>
<td>Degree levels</td>
<td>2357 bachelor’s degree students</td>
</tr>
<tr>
<td></td>
<td>1254 master’s degree students</td>
</tr>
<tr>
<td>Gender distribution</td>
<td>55% female</td>
</tr>
<tr>
<td></td>
<td>45% male</td>
</tr>
<tr>
<td>Age range</td>
<td>18–30 years old</td>
</tr>
</tbody>
</table>
Table 1. Cont.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average age</td>
<td>22 years</td>
</tr>
<tr>
<td>Fields of study</td>
<td>- Technical sciences or technology (25%)</td>
</tr>
<tr>
<td></td>
<td>- Natural and health sciences (18%)</td>
</tr>
<tr>
<td></td>
<td>- Pedagogy (19%)</td>
</tr>
<tr>
<td></td>
<td>- Economics (12%)</td>
</tr>
<tr>
<td></td>
<td>- Social sciences (27%)</td>
</tr>
</tbody>
</table>

Notes: The percentages for fields of study represent the proportion of students within each category.

Table 2. Categorization by field of study.

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical sciences</td>
<td>25%</td>
</tr>
<tr>
<td>Natural and health sciences</td>
<td>18%</td>
</tr>
<tr>
<td>Pedagogy</td>
<td>19%</td>
</tr>
<tr>
<td>Economics</td>
<td>12%</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>27%</td>
</tr>
</tbody>
</table>

Additional characteristics of the sample

The age groups were further broken down as follows: 18–20 years (35%), 21–23 years (40%), 24–26 years (15%), and 27–30 years (10%).

2.2. Measurement

The questionnaire data were primarily nominal. The following variables were measured:

1. Education on Using Literature Sources: Whether students had received education on using literature sources correctly (yes/no).
2. Frequency of Plagiarism: How often students commit plagiarism (always, often, sometimes, or never).
3. Reasons for Plagiarism: Reasons given by students for committing plagiarism.

In our study, we employed a structured questionnaire to measure a range of nominal variables that were critical in understanding plagiarism behaviors among students. The primary focus was on whether students had received education on using literature sources correctly. We further explored the frequency of plagiarism, which ranged from “always” to “never”, providing a nuanced view of students’ tendency to engage in plagiarism. Additionally, we investigated the reasons why students might choose to plagiarize. These reasons varied and included a lack of expertise in writing original texts, time constraints, perceptions that teachers do not thoroughly read the assignments, and the repetitive nature of assignments year after year. Furthermore, the effectiveness of anti-plagiarism software and students’ awareness of what constitutes plagiarism were also scrutinized. Through these variables, we aimed to capture a comprehensive snapshot of the factors influencing plagiarism among university students (answer options are further listed in Section Factors Causing Plagiarism).

For the purpose of this research, the term “teacher” refers to the professor, lecturer, or instructor.
2.3. Analysis

To measure the association between nominal variables, we used the chi-square goodness-of-fit test and calculated it as follows:

$$
\chi^2 = \sum_{i=1}^{m} \sum_{j=1}^{k} \frac{(E_{ij} - T_{ij})^2}{T_{ij}}
$$

(1)

The critical values were calculated as follows: $\chi^2(\alpha, (m - 1)(k - 1))$ and $\alpha = 0.05$; $E_{ij}$ is the observed frequency, where $i = 1, 2, \ldots m$ and $j = 1, 2, \ldots k$; $T_{ij}$ is the expected frequency; and $\chi^2$ is the chi-square test statistic.

Comparisons of research questions (RQs) using chi-square tests:

- **RQ (1) Education on Using Literature Sources vs. Fields of Study:** To determine whether there are statistically significant differences in whether students had received education on using literature sources across different fields of study.
- **RQ (2) Frequency of Plagiarism vs. Fields of Study:** To identify whether the frequency of plagiarism reported by students varies significantly across different fields of study.
- **RQ (3) Frequency of Plagiarism vs. Education on Using Literature Sources:** To assess whether the frequency of plagiarism differs between students who had received education on using literature sources and those who had not.

Measures of association between two nominal variables included the following:

- **Cramer’s V coefficient** is used to measure the strength of association between categorical variables. The coefficient is applied to the same comparisons examined in the chi-square tests to determine the strength of the associations found.

$$
C = \sqrt{\frac{\phi^2}{1 + \phi^2}} = \sqrt{\frac{\chi^2}{n + \chi^2}}
$$

(2)

- **Tschuprow’s τ coefficient** is another measure of association that is used alongside Cramer’s V for robustness.

$$
\tau = \sqrt{\frac{\phi^2}{(m - 1);(k - 1)}}
$$

(3)

- **Pearson’s C coefficient** is additionally used for measuring associations between variables.

$$
V = \sqrt{\frac{\chi^2}{n.h}}; h = \min((m - 1);(k - 1))
$$

(4)

The values of these indicators range between 0 and 1, with values closer to 1 indicating a stronger association between nominal indicators [30].

Descriptive statistics were used to summarize the basic features of these data, providing simple summary information about the sample and the measures. This information includes calculations of means, percentages, and distributions of responses.

3. Results

The first condition required if students are to avoid plagiarism is that they must be educated in using literature sources and correctly referring to other authors’ ideas. Therefore, our study investigated whether the respondents had been educated on this issue. Moreover, as stipulated above in the methodology, we determined whether there were any statistical differences among the answers given by respondents from different fields of study. The results are documented in Figure 1.
we used the chi-square goodness-of-fit test for more than two independent sets based on plagiarism in the social sciences compared with the technical and natural sciences, including the physical sciences the most”. Arhin also confirmed the differences “in student perceptions of academic dishonesty by disciplines”. However, in contrast to our results, it was revealed that “students majoring in nursing most frequently recognized academic dishonesty compared to the other students sampled in this study” [32] (p. 710).

According to Figure 1, we can conclude that, in general, all fields of study focus on educating students on the correct use of literature sources and how to cite the ideas of others. It follows that approximately two thirds of the respondents graduated from courses during their university studies in which they learned to use literature sources correctly. Approximately 33% of the respondents said they did not learn this at university. Although this percentage is lower than the percentage of respondents who answered in the affirmative, it is still a high proportion considering the growing issue of plagiarism. Figure 1 does not clearly show statistically significant differences among the fields of study regarding education on the correct use of literature sources. Therefore, considering the nominal data, we used the chi-square goodness-of-fit test for more than two independent sets based on the standard significance level $\alpha = 0.05$. The test confirmed the existence of statistically significant differences between fields of study in relation to having received education on using literature sources ($p$-value $= 6.78 \times 10^{-15}$). We can further conclude that technical sciences and natural and health sciences prioritize educating students on the correct use of literature sources. By contrast, statistically significant differences ($p$-value $= 0.06$) were not confirmed among fields of study such as pedagogy, economics, and social sciences. A total of 70–80% of students stated that they learned to quote and use literature sources. We can conclude that social sciences, including pedagogy and economics, are more effective in correctly preparing students for citing literature sources and the ideas of others. Similar conclusions can be found in the studies of other researchers [31] (p. 849). The authors of a survey-based study at Midwestern University in the U.S. stated that “students in education and the social sciences reported the least involvement in e-dishonesty; engineering and physical sciences the most”. Arhin also confirmed the differences “in student perceptions of academic dishonesty by disciplines”. However, in contrast to our results, it was revealed that “students majoring in nursing most frequently recognized academic dishonest behaviours compared to the other students sampled in this study” [32] (p. 710).

This conclusion raises the question of whether there is statistically significantly less plagiarism in the social sciences compared with the technical and natural sciences, including the health sciences. If this is the case, we can consider—together with the authors of [27]—that proper education on using literature sources is an important tool for solving the issue of plagiarism in the academic environment. Therefore, the next question we evaluated was whether students commit plagiarism at school. The answer options for this question were as follows: “always”, “often”, “sometimes”, and “never”. Figure 2 shows the distribution of the responses.

Figure 1. Students’ education on the correct use of literature sources by field of study. Source: authors’ calculation according to the TODAROZUM project (2023) database [29].
Based on the results shown in Figure 2, which consist of responses to questions about the occurrence of plagiarism at universities, we can state that the answer "plagiarism occurs only sometimes" was given by 53% to 62% of respondents, depending on the field of study. However, the rate at which respondents answered "plagiarism occurs only often" is concerning, as the percentage values ranged from 19% to 31%. Even more concerning is the fact that up to 31% of all students studying economics selected the answers "always" and "often"; this result was unexpected, as economics is a field of study that assigns high priority to education on the correct use of literature sources (as stated by 74.7% of the respondents studying economics). However, the percentage of economics students giving that response was less than that of students in the technical sciences, 33% of whom selected the answers "always" and "often". However, our survey also revealed that the technical sciences do not assign a very high priority to providing education on the correct use of literature sources (only 52.13% of the respondents studying technical sciences stated that they had been educated in this matter). The existence of statistically significant differences among fields of study in terms of the amount of plagiarism was also confirmed using the chi-square test ($p$-value $= 2.26 \times 10^{-8}$). Based on the above results, the preliminary conclusion can be drawn that preventive measures in the form of providing students with education on academic integrity, moral codes of conduct, and the benefits of correctly using literature sources are not sufficient tools to solve the issue of plagiarism in the academic environment.

Therefore, we decided to verify this finding by dividing the students into two groups within each field of study: the first group consisted of the respondents who stated that they had learned to use literature sources correctly, and the second group consisted of the respondents who stated that they had not learned this skill. In both groups, statistically significant differences in the occurrence of plagiarism were preserved across the fields of study (the first group: $p$-value $= 0.0044$; the second group: $p$-value $= 0.0001$). However, the rate at which students replied "always" and "often" to the question of the occurrence of plagiarism ranged from 20% to 31% in the first group and from 23% to 45% in the second group, depending on the field of study. In both cases, the first ranks were occupied by technical and economic sciences.

Therefore, we decided to test all of the respondents’ answers, regardless of the field of study. We tested whether there are statistically significant differences in the frequency of plagiarism between the first group (the group that had learned to use literature sources correctly) and the second group (the group that had not received this education). The chi-square test results ($p$-value $= 0.0009$) confirmed statistically significant differences between
the groups. In the first group, plagiarism occurs less often, with only 23% of the respondents indicating that plagiarism occurs “often”; in the second group, 28% of the respondents stated that plagiarism occurs “often”. Considering the previous results, we can conclude that education has a positive impact on solving the issue of plagiarism, and we agree with Uzun and Kilis [27] that pedagogy is an appropriate method to mitigate plagiarism.

However, the question remains: how strong is the effect of education on solving the issue of plagiarism? Therefore, we decided to test the dependence between the frequency of plagiarism and the students’ education in using literature sources correctly. Since these are nominal variables, we used Tschuprow’s, Cramer’s, and Pearson’s correlation coefficients to calculate the dependence. The results of all three coefficient tests were very similar (Pearson’s correlation coefficient: $C = 0.0683$; Tschuprow’s coefficient: $\tau = 0.0684$; and Cramer’s coefficient: $V = 0.0684$). The obtained coefficients show that there is a dependence between the frequency of plagiarism and students being educated in correctly quoting literature, but the size of the dependence is relatively small (only 6%). The most significant difference between the group educated in using literature sources correctly and the groups that had not received this education was found in the economic sciences. The occurrence of plagiarism (answers “always” and “often”) was reported by 26% of the respondents in the first group (the group that had learned to use literature sources correctly) and 45% of the respondents in the second group (the group that had not learned this skill). For this reason, we calculated the aforementioned coefficients for this group of students separately, obtaining the following values: Pearson’s correlation coefficient, $C = 0.1844$; Tschuprow’s coefficient, $\tau = 0.1083$; and Cramer’s coefficient, $V = 0.1877$. The dependence increased to a maximum of 18%. This result indicates that providing education on the correct use of literature sources as a preventative measure against plagiarism has the ability to reduce plagiarism by 6% to 18%. It follows that this is a useful measure; however, education alone will not solve the issue of plagiarism. Therefore, it is necessary to look for other preventive or repressive plagiarism-reduction measures.

Factors Causing Plagiarism

Based on the above-mentioned findings, we examined the factors that cause plagiarism using the questionnaire question, “Why do some students submit plagiarism?” The respondents had the opportunity to choose from 10 answers (options A–J). However, the tenth option (option J—formulation of a free answer) was not used by the respondents; therefore, we excluded this option from the evaluation. The individual answer options were as follows:

A. The student is not expert enough to write an original text;
B. Students do not have time to write original texts;
C. Teachers do not read the work;
D. Teachers require only a description of the topic from existing sources;
E. Teachers give the same assignments every year;
F. Anti-plagiarism software detects only some plagiarism;
G. Plagiarism is not monitored in term papers;
H. Describing even a small part of the work is considered plagiarism;
I. Students do not know what plagiarism is;
J. Other (write your own answer).

The responses to the above question were as follows: answer “A” dominated (selected by 20% of the respondents), followed by answer “B” (19% of the respondents), answer “G” (15% of the respondents), answer “E” (13% of the respondents), and answer “C” (10% of the respondents). The answer given least frequently was “F” (2% of the respondents), which is likely due to anti-plagiarism software being generally only used for final theses; this software is rarely required for term papers, assignments, or projects. This rationale is supported by answer “G”, which was the third-most-frequent selection, in which students stated that plagiarism is not monitored in term papers.
Answers “A” and “B” dominated equally in all fields of study. Answers “G” and “E” were the third- and fourth-most-common answers in the majority of fields of study, except pedagogy and social sciences. Answer “C” (teachers do not read the work) was the fourth-most-common response. Answer “I” (students do not know what plagiarism is) was selected by surprisingly few respondents. Only 6% of the respondents indicated this answer, regardless of the field of study (this answer was given by 5% to 8% of respondents and was the second-least-frequent option in all fields of study). Based on the above, it can be concluded that the field of study has no influence on the reasons students give for committing plagiarism.

Furthermore, we divided the respondents, regardless of their field of study, into two groups, namely, the first group (the group that had received education on the correct use of literature sources) and the second group (the group that had not received such an education). We would expect that the second group, without education on the correct use of literature sources, would be more likely than the other group to select answer “I” (students do not know what plagiarism is); however, this assumption was not confirmed. The order of the answers did not change regardless of whether or not students had received education on the correct use of literature sources. The answers “A” and “B” dominated again, and answers “E” and “G” came in third and fourth places. Based on the above, we can conclude that, regardless of the field of study and of whether or not students had received education on correctly quoting literature sources, the reasons for plagiarism are the same: “A” (the student is not expert enough to write an original text), “B” (students do not have time to write original texts), “E” (teachers give the same assignments every year), and “G” (plagiarism is not monitored in term papers). Based on these findings, there are two important conclusions. First, students are aware that they are committing plagiarism and are more likely to engage in this practice when there is a high probability that there will be no consequences. This means that preventive measures aimed at providing education about plagiarism have only a supplementary role in deterring students from such actions. Similar results have been revealed by Woodbine [33] (p. 139), who showed that “despite an attempt to sensitize students prior to the test to the importance of moral codes of conduct, a high incidence of cheating was reported”. Second, teachers are also responsible for plagiarism through enabling or creating an academic environment in which it is easier for students to plagiarize without consequences. For example, teachers may not monitor plagiarism in seminar papers, assignments, or projects. Furthermore, some teachers may not change the topics of course papers frequently enough or may require seminar papers that exceed course requirements. Moreover, many students are burdened with an excess of seminar papers during the semester to the extent that they cannot produce all the work on their own. We agree with Zobel and Hamilton [34] (p. 30), who explained that “staff still needs to be vigilant, keep records, design fresh cheat-proof assignments and assessments every year”. Similar findings were revealed by Iberahim et al. [35] (p. 152), who found that “most students participated in academic dishonesty because the lecturer did not mind the behaviour”. Moreover, Kenny [36] (p. 14) stated that “it is essential that academic institutions foster a culture of honesty and integrity amongst its academic community. A culture that clearly emphasizes that plagiarism in any form is unacceptable”.

Finally, in view of the ongoing accreditation at Slovak universities, we were also interested in determining whether the number of courses that students have to complete within one semester has any effect on the occurrence of plagiarism. This evaluation was based on the respondents’ answers that they do not have time to write original texts (answer “B”). We based the analysis on the question in the questionnaire about how many courses students have on average per semester and the question regarding the frequency of plagiarism (“always”, “often”, “sometimes”, and “never”). Based on descriptive statistics, the respondents’ answers showed that the average number of subjects per semester ranged from 7.74, with the frequency of plagiarism being “sometimes”, to 8.32, with the frequency of plagiarism being “always”. Thus, students always had approximately eight courses per semester, regardless of the frequency of plagiarism. Therefore, we can conclude that
the frequency of the occurrence of plagiarism does not depend on the number of courses students are enrolled in per semester; thus, the answer “students do not have time to write original texts” (answer “B”) is not related to students having too many courses per semester.

Despite these findings, we further investigated whether there is a relationship between the frequency of the occurrence of plagiarism (“always”, “often”, and “sometimes”) and the causes of plagiarism, focusing on the reasons most frequently provided in the questionnaire: A, B, E, and G. At the same time, we verified the answers provided by the respondents regarding whether plagiarism actually occurs based on their stated reasons. If the stated reasons are the most common causes of plagiarism, we assume that their occurrence affects the frequency of plagiarism and, at the same time, that there is a strong dependence between the given reasons and the frequency of plagiarism. The results are shown in Table 3.

Table 3. Coefficients of dependence between the frequency of plagiarism and the above-mentioned reasons for committing plagiarism. Source: the authors’ calculations are based on the data from the TODAROZUM project (2023) questionnaire [29].

<table>
<thead>
<tr>
<th>Reasons for Plagiarism</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\chi^2)</td>
<td>2364</td>
<td>8225</td>
<td>102,514</td>
<td>20,982</td>
<td>92,580</td>
<td>11,722</td>
<td>28,335</td>
<td>18,395</td>
<td>0.623</td>
</tr>
<tr>
<td>C</td>
<td>0.028</td>
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<td>0.179</td>
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<td>0.171</td>
<td>0.062</td>
<td>0.095</td>
<td>0.077</td>
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</tr>
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<td>τ</td>
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<td>0.037</td>
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</tr>
<tr>
<td>V</td>
<td>0.028</td>
<td>0.052</td>
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<td>0.083</td>
<td>0.173</td>
<td>0.062</td>
<td>0.096</td>
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</tbody>
</table>

Despite the students’ answers indicating that the most frequent reasons for committing plagiarism are A, B, E, and G, it follows based on the above data that regardless of whether “A” or “B” was given as a reason, the frequency of plagiarism does not change. In other words, the occurrence of reason “A” does not affect the frequency of plagiarism; thus, the dependence coefficients are irrelevant (2%). For reason “B”, the chi-square test confirmed the impact of this reason on the frequency of plagiarism, but the degree of dependence is negligible, ranging from 3% to 5% depending on the chosen coefficient. A similar conclusion can be drawn for reason “G”, for which the dependence ranges from 6.8% to 9.6%.

By contrast, plagiarism increases significantly if reasons “C” (the teacher does not read the work) and “E” (the teacher gives the same assignments every year) are indicated. The dependence between the reasons and the frequency of the occurrence of plagiarism ranges from 13% to 18%. This result is more robust than those for found other reasons.

Finally, reason “I” (the student does not know what plagiarism is) does not affect the frequency of the occurrence of plagiarism (p-value = 0.73). In other words, a lack of knowledge about plagiarism does not lead to an increase in the frequency of plagiarism, thus indirectly confirming the findings regarding the strength of the teaching effect (at 6%) mentioned above.

Students most often selected answers “A”, “B”, and “G” as reasons for committing plagiarism, regardless of the frequency of plagiarism that they reported. However, in cases where the reasons “C” and “E” were given, the share of students indicating that plagiarism occurs “often” increased, while the proportion reporting that plagiarism occurs only “sometimes” decreased. It follows that direct measures (e.g., teachers checking seminar papers for plagiarism or regularly changing assignment topics) have a more substantial effect on reducing the incidence of plagiarism than do preventive measures in the form of education on academic integrity and moral codes of conduct in the academic environment.

4. Discussion and Implications

According to our findings, education is still a very important measure against plagiarism; however, education needs to be accompanied by repressive measures focused on mitigating plagiarism. Park [8] (p. 471) proposed “to develop cohesive frameworks for dealing with student plagiarism that are based on prevention supported by robust detection and penalty systems that are transparent and applied consistently”. Stone [37] (p. 227)
also combined both types of measures and explained that “academic misconduct may be reduced by shaping attitudes toward cheating, changing perceptions of subjective norms regarding the prevalence of cheating, and lowering students’ perceptions of their control of cheating by, for example, emphasis on the consequences of getting caught”, as “seeing others cheat increases cheating behaviour by causing students to judge the behaviour less morally reprehensible” [38]. To avoid plagiarism, Cerdà-Navarro et al. [39] emphasized the need to combine regulatory, punitive, and educational measures. Devlin [9] (p. 45) preferred educational measures to punitive ones and focused on “the inclusion of learning and teaching strategies in anti-plagiarism-related policy and practice” at several universities in 2006; however, considering over 20 years of research, the results of this study, and the results of other studies quoted in this article, we have to conclude that educational measures alone are not sufficient to prevent plagiarism. The implementation of anti-plagiarism policies across universities varies, as stated by the authors of [40] (p. 215): “students are trained in some countries more than in other countries. Anti-plagiarism policies and procedures are common in some countries and rare in other ones”. We agree with East [41] (p. 48), who asserted that “through education, we can promote values, change understandings, change behaviour and stop certain behaviours”. Still, these values must first be adopted by teachers, especially in their own work and research activities, then put into practice further by requiring uncompromisingly that students meet academic integrity standards that uphold anti-plagiarism values.

Plagiarism is defined as an appropriation of someone else’s work, but there are other definitions in use. Numerous examples of plagiarism are regulated in copyright codes; however, there are still many examples of plagiarism that are regulated only by ethical standards. Therefore, there is generally a lack of knowledge as to what kinds of conduct can be regarded as plagiarism according to various ethical standards, which differ from country to country. Many universities adopt their own ethical codes; however, a commonly accepted definition that encompasses all actual forms of plagiarism is missing. Therefore, a clear definition of what constitutes plagiarism and how best to provide education on plagiarism, including plagiarism assisted by the new phenomenon of artificial intelligence, are very important for both university students and academic staff. Furthermore, in some cases, plagiarism is not committed intentionally and is, instead, a result of a student or even a teacher being uninformed about such conduct being undesirable and against academic ethics. Therefore, some authors consider addressing plagiarism through pedagogy to be the best measure.

However, in this study, we considered the question of whether education alone is able to solve the issue of plagiarism or whether the combination of both sets of measures (preventive and repressive) is needed to effectively address plagiarism. The research questions included an investigation of whether sufficient priority is assigned to educating students about plagiarism at Slovak universities and, if so, whether this education is sufficient to solve the issue of plagiarism in the university environment. The results of this study confirmed that all fields of study focus on educating their students on how to correctly cite literature sources and the ideas of others; however, technical fields, the natural sciences, and the health sciences did not prioritize providing education on correctly using literature sources as much as social sciences, including pedagogy and economics, did. We confirmed statistically significant differences between the group that had learned to use literature sources correctly and the group that had not received this education. As a result, we concluded that education has a positive impact on reducing plagiarism.

Although the existence of education is important, the effect size reflects its impact on reducing plagiarism. We tested the dependence between the frequency of plagiarism and the number of students who had learned to use literature sources correctly. The given coefficients show that there is a dependence between the frequency of plagiarism and students learning to correctly quote literature sources, but this dependence is relatively small. The provision of education on the correct use of literature sources has the ability to reduce plagiarism by 6% to 18%. It follows that this is a useful measure; however,
education alone cannot solve the problem of plagiarism, and it is necessary to look for other preventive or repressive measures. Therefore, we investigated the factors that cause plagiarism. Based on the analysis of the questionnaire, we can reach two important conclusions. First, despite the students being aware that they are committing plagiarism, they are likely to engage in this practice, as there is a high probability that there will be no consequences. This indicates that preventive measures aimed at education about plagiarism fulfill only a role supplementary to that of repressive measures, which deter students from such actions. Second, teachers are also responsible for plagiarism through enabling or creating an academic environment that allows students to plagiarize without consequences. For example, teachers may not monitor plagiarism in seminar papers, assignments, or projects. Furthermore, some teachers may not change the topics of course papers frequently enough or may require seminar papers that exceed course requirements. Moreover, many students are burdened with an excess of seminar papers during the semester to the extent that they cannot produce all the work on their own. Therefore, measures such as checking seminar papers for plagiarism and making regular changes to assignment topics can be expected to have a more substantial effect on reducing plagiarism than preventive measures in the form of education.

Developing the initial stage of a plagiarism theory in Slovakia involves a comprehensive approach that considers historical, cultural, educational, and legal perspectives. Plagiarism has always been a problem in the university environment, and our previous research [42] confirmed that existing legal regulations do not reflect the whole gamut of possible instances and circumstances of unscientific, unethical, and dishonest conduct. The historical evolution of academic norms in Slovakia led to institutions having less experience with the concept of plagiarism [43]. Since joining the E.U. in 2004, Slovakia has aligned its academic standards with those of Western Europe. This integration has introduced increased awareness of plagiarism and the need for stricter academic-integrity policies. In Slovakia, a unified system to detect plagiarism in bachelor’s and master’s degree theses was introduced in 2009 [23]; despite this, a central system for checking seminar theses and papers for plagiarism is missing. Studies by the authors of [20,23] proposed to improve legal and institutional cooperation in Slovakia. We can conclude that, although some improvements have been made—mainly within the legal framework, which is now aligned with European legal regulation [42]—institutional cooperation is still missing, and this misalignment does not allow for the implementation of repressive measures. The absence of a systemic barrier to plagiarism in academic environments indicates the need for the development of academic integrity in Slovakia, and this development must be supported by existing laws and regulations related to the protection of intellectual property and copyright. Therefore, we propose the establishment of a Tertiary Educational Quality Agency to address the issue of plagiarism explicitly and coordinate procedures to introduce a uniform policy. Such an agency, as a member of the European Network for Academic Integrity, could contribute to unifying the common policy of Slovakia with those of other EU countries. There is a need to introduce standardized guidelines and policy strategies to develop and implement awareness programs to educate students and teachers about plagiarism, its consequences, and the importance of originality in academic work. Based on our research, it would be appropriate to integrate compulsory courses on academic writing and organize workshops involving interactive discussions between students and teachers about ethics in academic writing with a focus on avoiding plagiarism and motivating students. Moreover, it is recommended that teachers receive training on how to effectively use such anti-plagiarism tools and interpret their results.

Our research was realized within a project that is part of a national survey conducted among students of Slovak universities. Due to this fact, our research is unique, in comparison with other authors’ previous studies [40,43], providing more comprehensive data on plagiarism among students and involving a wider range of higher-education institutions in Slovakia. In this study, we proved that education on plagiarism plays an important role; however, our findings also indicate that education alone is insufficient to solve the issue of
plagiarism—rather, education only reduces it. We also examined the reasons that lead students to commit plagiarism and demonstrated differences in the level of plagiarism among the fields of study. Moreover, our research points to the necessity of the implementation of common preventive and repressive anti-plagiarism measures on a national level, as we demonstrated that students commit plagiarism due to such conduct not being consistently monitored and detected by teachers.

Based on our findings, identifying the common factors that contribute to plagiarism would be more effective if the policies and regulations regarding plagiarism were reviewed in Slovakia and in different countries. Research could then reveal how institutional frameworks impact the prevalence and nature of plagiarism. Such frameworks include academic-integrity policies, penalties for plagiarism, and preventive measures. Comparative studies on plagiarism in Slovakia and other countries are required on an ongoing basis to identify common themes and unique findings; such research requires surveys conducted among students and educators and reports from educational institutions that can provide first-hand data on the prevalence and perceptions of plagiarism.

Based on our research, we can conclude that, in order to manage plagiarism effectively—both within Slovakia and internationally—a multi-faceted approach that combines education, teachers’ involvement, repressive measures, and institutional frameworks is crucial. This multi-faceted strategy not only addresses the unique needs of Slovakia, but also offers insights for other countries grappling with the issue of plagiarism in academia.

5. Future Research

Plagiarism remains a pervasive and challenging issue in the global academic landscape. This issue not only affects the integrity of educational institutions, but also poses a critical impediment to the development of students’ research and critical-thinking skills. As we look ahead to future research endeavors, our focus will be on a comprehensive examination of the role of educators in mitigating plagiarism and on their valuable contributions to enhancing pedagogical practices in this area. Future research could also focus on additional forms of academic misconduct beyond plagiarism, as reported by Cerdà-Navarro et al. [39] (p. 11), such as fraudulent actions during examinations, dishonest conduct of a general nature, research-related unethical conduct, and other factors related to problem behaviors described by Comas-Forgas et al. [44] (pp. 4–5).

One of the primary areas of interest in future research will be the active involvement of teachers in addressing plagiarism. Our future research could aim to investigate the extent to which educators are engaged in plagiarism-reduction efforts and how their experiences, strategies, and feedback can inform improvements in pedagogical approaches. Understanding educators’ perspectives is crucial, as educators play a pivotal role in shaping students’ understanding of academic integrity and responsible research practices.

Furthermore, our future research could explore the implementation of innovative methods and multi-dimensional approaches to address the issue of plagiarism. In collaboration with partner universities, both within Europe and beyond, further studies may determine the effectiveness of these strategies in different academic contexts. This transnational cooperation would allow us to draw upon diverse experiences and best practices, providing a holistic view of plagiarism reduction and prevention. Our research endeavors could not only shed light on the extent of teachers’ involvement in plagiarism reduction, but also seek to harness their insights for the enhancement of pedagogical practices. Through implementing and evaluating new strategies in collaboration with a network of European and non-European universities, our findings could significantly contribute to the ongoing efforts to combat plagiarism and foster a culture of academic integrity.

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