Assessing knowledge of and attitudes towards plagiarism and ability to recognize plagiaristic writing among university students in Rwanda

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Abstract
Plagiarism is a serious type of scholastic misconduct. In Rwanda, no research has been conducted to assess university students’ attitudes and knowledge of plagiarism and if they have the skills to avoid plagiarizing. This study was conducted to assess knowledge of and attitudes towards plagiarism, as well as ability to recognize plagiaristic writing, among university students in Rwanda. An online questionnaire containing 10 knowledge questions, 10 attitude statements, and 5 writing cases with excerpts to test identification of plagiarism was administered between February and April 2021. Out of the 330 university students from 40 universities who completed the survey, 75.8% had a high knowledge level (score ≥ 80%), but only 11.6% had a high score in recognizing plagiaristic writing (score ≥ 80%). There was no statistically significant association between knowledge level and ability to recognize plagiaristic writing (P = 0.109). Lower odds were found in both diploma/certificate and bachelor students of having high knowledge as well as of having high ability to recognize plagiaristic writing than in master’s students. Although respondents generally disapproved of plagiarism, approximately half of the respondents indicated that sometimes plagiarism is unavoidable, and self-plagiarism should not be punished in the same way as plagiarism of others’ work. Inter-collegial collaboration on effective plagiarism policies and training programs is needed.

Keywords Plagiarism · Rwanda · Academic integrity · Higher education
Introduction

Plagiarism is a serious type of scholastic misconduct (Anderson & Steneck, 2011; Ewing et al., 2016; Gómez et al., 2013; Owens & White, 2013) and is considered one of the most severe breaches of academic integrity. Academic integrity is the commitment to honesty, trust, fairness, respect, and responsibility as the foundational cornerstones of academia (Keohane, 1999). With plagiarism defined as stealing and passing off the ideas of another, or from an existing source, as one’s own without crediting the source (Merriam-Webster n.d), plagiarism is arguably one of the most pressing concerns facing higher education institutions today. With advances in information technology, it has become increasingly easy to access information, articles, and other students’ assignments on the internet, presenting students with ample opportunities to plagiarize the work of others (Honing & Bedi, 2012; Owens & White, 2013; Ramzan et al, 2012; Snow, 2006). This has been of particular importance in the higher education space with the rapid growth of online education due to the COVID-19 pandemic and the closure of many higher education institutions all over the world. It has been suggested that the switch to online learning has resulted in an increase in plagiarism. One study suggested that there has been a significant rise in “contract cheating” during the COVID-19 pandemic, whereby students pay for online tutors to take examinations or write assignments for them (Hill et al. 2021). As well as easy access to information online, a lack of support for students’ writing development and the constraints on faculty teaching capacity in challenging circumstances has resulted in plagiarism becoming more prevalent in recent times (Bailey, 2020).

However, more broadly, studies have found that academic dishonesty of varying degrees among students in higher education institution settings has generally always been a common issue worldwide (Amos, 2014; Owens & White, 2013). In a study in the UK surveying 49 higher education institutions, 91% of the institutions reported mild to moderate levels of plagiarism among their students, and 2% reported severe (Parry & Houghton, 1996). In a study conducted in 2010 in the USA, more than 50% of students surveyed reported having cheated or plagiarized at some point in their academic careers (Owunwanne et al. 2010). Similarly, in Taiwan, the prevalence of plagiarism was 66.1% (Lin & Wen, 2007).

The Sustainable Development Goal (SDG) 4, Quality Education, aims to promote quality education and lifelong learning opportunities, especially in developing countries (UN, 2021). Targets from SDG 4 such as increasing access to tertiary education and ensuring that young people and adults are equipped with employable skills are directly linked to the quality of education provided at university level. Given that the long-term personal and professional success of both universities and their students goes hand-in-hand with academic honesty and integrity (Cavico & Mujtaba, 2009), studying and addressing issues of plagiarism in higher education institutions in developing countries is vital to achieve the SDG 4 targets. For example, when examining African research studies, Rohwer et al (2018) identified that out of 495 biomedical research journal articles studied, 313 had evidence of plagiarism. Quality of academic work and research is severely compromised by plagiarism. In the higher education institution setting, a study conducted by Iloh et al. in 2018 found that among Nigerian university students, although knowledge of plagiarism was high, attitudes towards plagiarism were poor, resulting in a high level of plagiarism among students. In Rwanda, although there are no studies measuring prevalence or attitudes towards plagiarism, plagiarism is thought to be widespread, and there is a general lack of training for students in this area (Rugira 2015).
When it comes to what students may consider plagiarism, one study examining students’ perceptions of plagiarism in the UK found that there was a significant lack of knowledge around whether taking someone else’s ideas, colluding on a paper, or downloading material from the internet were considered plagiarism (Dawson & Overfield, 2006). Further to this, some studies have found that students did not see any harm in plagiarizing, particularly with the internet providing free access to information (Evering & Moorman, 2012), and that this failure to recognize plagiarism or that it constitutes academic dishonesty was more prevalent in lower-income countries (Iloh et al., 2018; Ramzan et al., 2012). Students who received a lower grade point average (GPA) were more likely to plagiarize than those who were more academically successful (Honing & Bedi, 2012), and one study, conducted by Gomez et al. in 2013, found that students were more likely to plagiarize when the assignment contributes less to their overall final grade, suggesting an awareness of the consequences of plagiarism for higher stake assignments. As pointed out by different studies, variations in the attitude or the understanding of what constitutes plagiarism exist due to different cultures (Lin & Wen, 2007; Magnus et al., 2002). It is therefore important to study plagiarism and the extent to which it occurs in local contexts.

Higher education institutions around the world are undertaking efforts to educate students by offering them guidance and training to explain the types and consequences of plagiarism, as well as how to avoid it. Different approaches are used to deliver this education and include classroom teaching, online modules, writing exercises, quizzes, and anti-plagiarism software (Belter & Du Pre, 2009; Dunn et al., 2013; Elander et al., 2010; Owens & White, 2013). Combining these approaches—for example, complementing classroom sessions with writing exercises and the use of plagiarism detection software—is a promising way to effectively reduce instances of plagiarism (Owens & White, 2013). However, evidence also suggests that even when plagiarism-detection tools were available, it is still necessary to train students on proper referencing, plagiarism, and academic integrity (Warn, 2006). This prevents unintentional plagiarism occurring due to inadequate knowledge of these, which is a major cause of plagiarism (Belter & du Pre, 2009). Training on such topics also instills high standards of academic integrity and honesty (Babalola, 2012). However, before instituting such training, it is important to understand the students’ ability to recognize plagiaristic writing in order to create appropriate training that is contextually relevant.

As mentioned before, although there are some studies on plagiarism focused on the African continent, there has been little research into this area in Rwanda specifically. It has been recognized that there is a lack of training for students in this area and the discussion around plagiarism has reached national attention through mainstream media publications (Rugira, 2015). However, students’ attitudes, knowledge, and abilities to recognize plagiaristic writing have never been formally assessed. Furthermore, without a clearer understanding of what students in Rwanda understand as areas of plagiarism, it is impossible to design effective education programs to reduce plagiarism across the country. This study is the first of its type in Rwanda and aimed to assess the attitudes, knowledge, and ability among students in Rwanda to recognize plagiaristic writing. Assessing the attitudes towards and knowledge of plagiarism provides important baseline information about how plagiarism is perceived by students and whether they are aware of what constitutes plagiarism. Examining ability will determine whether students can apply knowledge in practical situations to identify whether plagiarism is occurring. Assessing the association between knowledge level and application will identify potential gaps and assist in proposing intervention(s) to reduce plagiarism incidence among university students in Rwanda. This will provide important baseline information from which future studies can be conducted.
Materials and methods

Design

The study utilized an online questionnaire, conducted between February and April 2021, to assess knowledge of and attitudes towards plagiarism among university students in Rwanda, as well as their ability to recognize plagiarism in writing.

Sample and sampling method

Students who were enrolled in a degree program in any university in Rwanda were the study population. The higher education institutions in Rwanda enroll over 44,000 students every year (US Embassy 2019), with 70% in public universities. English is the official academic language used in all higher education institutions in Rwanda. A non-probability sampling method was used by sharing the survey link to different university faculty and students through personal and professional contacts. Deans and principals of universities were contacted by the study team via a letter delivered via email containing information about the study and a link to the survey. University leadership were requested to circulate the survey link to faculty and students, who in turn were encouraged to further share the link to other university students in Rwanda.

Data collection tool and methods

A questionnaire in English was designed for this study, with some questions adapted from a previously published study (Lindahl & Grace, 2018). The questionnaire was piloted at one university. The final questionnaire consisted of five main sections:

- Part 1 collected basic demographic information including age, sex, program degree, and university.
- Part 2 contained 10 “yes” and “no” questions related to knowledge of plagiarism.
- Part 3 presented five writing samples alongside excerpts from source materials. Respondents were asked to identify if the writing was plagiarized or not as well as to provide the reason. This section was designed to assess the respondent’s ability to identify plagiaristic writings.
- Part 4 had 10 Likert-scale statements related to the respondent’s attitude towards plagiarism. Each statement has five options: “Strongly agree,” “Agree,” “Neither agree nor disagree,” “Disagree,” and “Strongly disagree.”
- Part 5 had one open-ended question to ask respondents to provide comments.

All students fulfilling the selection criteria were invited to complete the anonymous online questionnaire. No identifying information was collected. All relevant information pertaining to the study and the protection of data was provided to participants on the first page of the online questionnaire. A statement of consent was also presented to participants on the first page of the online questionnaire to serve as a proxy for written consent.
This study was approved by the Institutional Review Board of the University of Global Health Equity.

Measures

The four key measures of this study were as follows:

1. Knowledge level on plagiarism. The knowledge score was calculated as the percentage of correct answers. The knowledge level was defined as high if the score was 80% or above and as low to moderate if the score was below 80% (Koo, Poh and Ruzita, 2015).
2. Attitude towards plagiarism. Percentages of respondents strongly agreed/agreed and strongly disagreed/disagreed on each of the 10 attitude statements.
3. Level of ability to recognize plagiaristic writing. The score was calculated as the percentage of correctly identified plagiaristic writings in the case studies. The ability level was defined as high if the score was 80% or above and as low to moderate if the score was below 80% (Koo, Poh and Ruzita, 2015).
4. Themes emerging from the open-ended question.

Data management and analysis

Data collected from the online survey were downloaded to Microsoft Excel and cleaned before being uploaded to SPSS for analysis.

Descriptive statistics were used to summarize the demographic data as well as the results of the key measures. Fisher’s exact tests were used to examine association between demographics, knowledge level, and level to detect plagiaristic writings. Binomial tests were used to detect if there was a significant difference in the percentage distribution of respondents between strongly agree/agree and strongly disagree/disagree of each of the 10 attitude statements. Content analysis was performed on the comments provided by the respondents through the open-ended question. All tests were performed by using SPSS v. 26, with P-value set at 0.05.

Results

Demographics

A total of 330 university students from 40 universities completed the online survey, with 222 (70%) of them attending private institutes and 94 (30%) attending public university. The mean age was 25.2 (SD 4.6), and the majority of students (n=193, 59%) were in a bachelor’s degree program (Table 1).

Knowledge on plagiarism and ability to recognize plagiaristic writing

The mean knowledge score was 83.1% (SD±16.3%). Out of the sample of 330, 248 (75.8%) had a high knowledge level (score ≥ 80%). On average, 49% (SD±20.0%) of the plagiarism was recognized, ranging from 0 to 100%, with 38 (11.6%) having scored 80% or above (Table 1).
Out of the 10 knowledge questions on plagiarism, there were only three in which less than 80% of students answered correctly. They were (1) question 5, expressing well-known common knowledge in your own words without a citation (60.2% correct); (2) question 4, copying a text from a paper you have already written previously without citation (75.2% correct); and (3) question 7, hiring others to write some parts of a paper you will turn in as your own (78.4% correct) (Table 2).

Table 1 Summary of the demographic information, knowledge, and ability to recognize plagiaristic writing

| Sample | N (%) |
|--------|-------|
| Age (year) Mean (SD) | 25.2 (± 4.6) |
| University Number participated | 24 |
| Private | 222 (70.3%) |
| Public | 94 (29.7%) |
| Degree program Diploma or certificate | 75 (23.0%) |
| Bachelor | 193 (59.2%) |
| Graduate degree | 58 (17.8%) |
| Knowledge score Mean (SD) | 83.1% (± 16.3%) |
| Below 80% (low to moderate) | 79 (24.2%) |
| 80% or more (high) | 248 (75.8%) |
| Recognizing plagiarism score Mean (SD) | 49.0% (± 20.0%) |
| Below 80% (low to moderate) | 291 (88.4%) |
| 80% or more (high) | 38 (11.6%) |

Table 2 Results of knowledge on plagiarism

| Correct n (%) |
|---------------|
| 1. Summarizing the ideas of another author in your own words with a citation 284 (88.2%) |
| 2. Downloading a paper from the internet and presenting it as your own work 306 (95.3%) |
| 3. Copying an excerpt from a paper, using quotation marks, adding a proper citation for the original text, and including a full reference at the end of the paper 275 (85.9%) |
| 4. Copying a text from a paper you have already written previously without citation 240 (75.2%) |
| 5. Expressing well-known common knowledge in your own words without a citation 192 (60.2%) |
| 6. Copying text directly from another paper with quotation marks only 270 (84.4%) |
| 7. Hiring others to write some parts of a paper you will turn in as your own 250 (78.4%) |
| 8. Using pictures from the internet without citing the source 281 (87.5%) |
| 9. Using information from a website that is publicly available without referencing 284 (88.5%) |
| 10. Translating information from a paper in a foreign language without referencing 279 (87.5%) |
| Mean (SD) 83.1% (± 16.3%) |
| Below 80% (low to moderate) 79 (24.2%) |
| 80% or more (high) 248 (75.8%) |
**Attitudes towards plagiarism**

There was no statistical significance detected between the percentages of respondents who agreed/strongly agreed and those who disagreed/strongly disagreed on three statements: (1) 44% agreed/strongly agreed that “sometimes plagiarism is unavoidable” ($P=0.052$); (2) 51.2% agreed/strongly agreed that “self-plagiarism should not be punished the same way as plagiarism of others” ($P=0.697$); and (3) 46.5% agreed/strongly agreed that “I should not change the words of an author who wrote something better than I could write it” ($P=0.222$) (Table 3).

Significantly more respondents agreed/strongly agreed on the following statements: (1) “All forms of plagiarism are unacceptable” (63.3%, $P<0.001$); (2) “If I found out that my colleague/classmate is plagiarizing, I would report the offense to a faculty member/supervisor” (59.4%, $P=0.001$); and (3) “Plagiarizing is as wrong as cheating on an examination” (85.8%, $P<0.001$) (Table 3).

Significantly more respondents disagreed/strongly disagreed on the following statements: (1) “For writers whose first language is not English, it is okay to copy parts of a paper written in English” (79.2% $P<0.001$); (2) “It is not plagiarism if my colleague/classmate gives me permission to copy from his/her paper” (80.9%, $P<0.001$); (3) “Plagiarism should not be penalized after an assignment grade is finalized and released” (68.8%, $P<0.001$); and (4) “Plagiarism is acceptable if only a small amount is copied” (67.9%, $P<0.001$) (Table 3).

**Factors associated with knowledge on plagiarism and ability to recognize plagiaristic writing**

Level of knowledge or ability to recognize plagiaristic writings was not significantly associated with private or public universities or year in program. The degree program respondents were enrolled in was associated with the knowledge level ($P=0.002$), and the ability to recognize plagiaristic writing ($P<0.001$) (Table 4).

The odds of having a high knowledge level was significantly lower for diploma/certificate students (OR = 0.15, $P=0.003$, 95% CI = 0.042, 0.534) and for bachelor students (OR = 0.132, $P=0.001$, 95% CI = 0.040, 0.441), compared to master students. The odds of having a high ability to recognize plagiaristic writing was significantly lower for diploma/certificate students (OR = 0.21, $P<0.001$, 95% CI = 0.085, 0.522) and for bachelor students (OR = 0.087, $P<0.001$, 95% CI = 0.037, 0.204), compared to master students (Table 5).

Statistical association was not detected between the knowledge level and ability to recognize plagiaristic writing ($P=0.109$) (Table 4). These results are consistent with the open-ended comments discussed below.

**Summary of results from open-ended questions**

Four general themes were identified through the analysis of the open-ended question:

1. **Not understanding self-plagiarism is a form of plagiarism**
| Attitude Statement                                                                 | Agree     | Disagree   | P-value   |
|-----------------------------------------------------------------------------------|-----------|------------|-----------|
| Sometimes plagiarism is unavoidable                                              | 144 (44.4%) | 180 (55.6%) | 0.052     |
| All forms of plagiarism are unacceptable                                         | 207 (63.3%) | 120 (36.7%) | <0.001    |
| For writers whose first language is not English, it is okay to copy parts of a paper written in English | 67 (20.8%) | 255 (79.2%) | <0.001    |
| Self-plagiarism should not be punished the same way as plagiarism of others       | 166 (51.2%) | 158 (48.8%) | 0.697     |
| It is not plagiarism if my colleague/classmate gives me permission to copy from his/her paper | 62 (19.1%) | 262 (80.9%) | <0.001    |
| If I found out that my colleague/classmate is plagiarizing, I would report the offense to a faculty member/supervisor | 192 (59.4%) | 131 (40.6%) | 0.001     |
| Plagiarizing is as wrong as cheating on an examination                            | 277 (85.8%) | 46 (14.2%)  | <0.001    |
| Plagiarism should not be penalized after an assignment grade is finalized and released | 100 (31.3%) | 220 (68.8%) | <0.001    |
| Plagiarism is acceptable if only a small amount is copied                         | 104 (32.1%) | 220 (67.9%) | <0.001    |
| I should not change the words of an author who wrote something better than I could write it | 151 (46.5%) | 174 (53.5%) | 0.222     |
Table 4  Association between demographic, knowledge level, and ability level to recognize plagiaristic writing

| University            | Knowledge level | Recognizing ability | P-value |
|-----------------------|-----------------|---------------------|---------|
|                       | High (≥ 80%)    | Low to moderate (< 80%) |         |
| Public                | 168 (70%)       | 54 (71.1%)          | 0.887   |
| Public                | 72 (30%)        | 22 (28.9%)          |         |
| Degree program        |                 |                     |         |
| Diploma or certificate| 55 (22.4%)      | 20 (25.3%)          | <0.001* |
| Bachelor              | 136 (55.3%)     | 56 (70.9%)          |         |
| Master or higher      | 55 (22.4%)      | 3 (3.8%)            |         |
| Year in program       |                 |                     |         |
| Final year            | 163 (65.7%)     | 49 (62%)            | 0.589   |
| Not final year        | 85 (34.3%)      | 30 (38%)            |         |
| Knowledge level       |                 |                     |         |
| High (≥ 80%)          | NA              | NA                  |         |
| Low to moderate (< 80%)| NA              | NA                  |         |

*Significant at P = 0.05.
### Table 5  Odds ratios of having high knowledge level and high ability to recognize plagiaristic writing among students from different degree programs

|                     | High knowledge level (≥ 80%) | OR   | P-value (90% CI) | High recognizing ability (≥ 80%) | OR   | P-value (90% CI) |
|---------------------|-------------------------------|------|------------------|----------------------------------|------|------------------|
| Diploma or certificate | 55 (22.4%)                   | 0.15 | 0.003 (0.042, 0.534)* | 8 (21.1%)                        | 0.21 | <0.001 (0.085, 0.522)* |
| Bachelor            | 136 (55.3%)                  | 0.132| 0.001 (0.040, 0.441)* | 9 (23.7%)                        | 0.087| <0.001 (0.037, 0.204)* |
| Master or higher    | 55 (22.4%)                   | Ref  | NA               | 21 (55.2%)                       | Ref  | NA               |

*Significant at $P = 0.05$. 
One common comment from the open-ended question was related to the lack of clear understanding of self-plagiarism, as illustrated by the following excerpts:

"I did not know that self-plagiarism exists, my understanding of plagiarism is using/presenting someone’s work as yours. Wish to know more about it." (Public university, 28 years old, Diploma/certificate student)

"Self-plagiarism shouldn’t be taken as a big deal. That’s my work, I copied mine, not someone’s else’s.” (Private university, 23, Bachelor)

2. Acknowledging plagiarism was a serious problem

Eighteen of the 56 comments from the open-ended question indicated that plagiarism was a serious problem and was very prevalent. Two mentioned that even their lecturers committed plagiarism.

"Sometimes the lecturers make students plagiarize because they also copy most things on the internet." (Public university, 25, Bachelor)

"I need to change [my] program because people are [plagiarizing] every day.” (unknown, 22, Bachelor)

"Thanks for thinking about this pandemic in academic affairs of nowadays." (Private university, 29, Diploma/certificate)

3. Seeing plagiarism as an academic dishonest act, but committed plagiarism regardless, for various reasons

Some students indicated they committed plagiarism because they want to achieve certain academic performance.

"[students] have to do that because they have to get some marks in the courses, students will do everything in power to have the marks needed." (Private university, 25, Bachelor)

Although most respondents indicated plagiarism was not acceptable and should be taken seriously, some also indicated that plagiarism was interpreted differently at different institutions.

"Plagiarism is culture specific. Depending on the context i.e. school system one went through, there interpretation of plagiarism may be different.” (Private university, 32, Master)

4. Ability to recognize plagiaristic writing was low despite understanding what plagiarism means

Among the 56 comments received through the open-ended question, 26 indicated that they were uncertain of the answers of the questions related to the knowledge or ability to recognize plagiaristic writings.

"It was a bit challenging." (Private university, 23, Bachelor)

"All of the samples were not plagiarized but they were not also all well summarized.” (unknown, 24, Master)
Discussion

The study results showed that university students in Rwanda overall have a high level of knowledge of plagiarism, with over 75% of participants having a high knowledge level and an average knowledge score of 83.1%. With regard to both knowledge of plagiarism and ability to recognize it, master degree level students were much more likely to have higher skills in both these areas as compared to diploma or bachelor degree level students. This however was not associated with whether students were enrolled in a public or private university or their year of study. Similar results were found in previous studies. In 2007, Lin and Wen found that first year university students were more likely to cheat academically, compared to more senior students. The prevalence also significantly decreased from high school to college (Davis et al., 2002; Jendreck, 1989; McCabe et al., 2001). It is likely that the longer students stay in school, the more exposure they have in writing and reading within the discipline-specific literacy practices required of them, resulting in better understanding and avoidance of plagiarism. These findings are consistent with our study results.

Similar to other studies conducted in other low- and middle-income countries, there were significant gaps in understanding what constitutes plagiarism (Amos, 2014; Evering & Moorman, 2012; Honing & Bedi, 2012; Iloh et al., 2018). About 40% of participants did not know that expressing well-known common knowledge without a source is not considered plagiarism, and about 25% did not know that self-plagiarizing is considered plagiarism. The results showed that although the overall knowledge level of plagiarism is high, there is still room for improvement and clarifications. About half of the respondents did not think self-plagiarism was wrong, with more than half of the respondents believing that self-plagiarism should not be punished the same way as plagiarism of others. Self-plagiarism is common in scholarly writing; authors reuse their own texts that have already been published previously as if they were new ideas (Goldblatt, 1984; Roig and Caso 2005; Broome, 2004), and it was among the most common misconceptions in our study. Authors who self-plagiarize do not make any new contributions to the scholarly world (Lowe, 2003). Such intent to deceive the readers is the main reason that self-plagiarism is considered wrong; readers should be informed about this duplication (Goldblatt, 1984). Our results demonstrate there was a general lack of understanding of the difference between citing themselves and reusing one’s own previous work.

Our study also found that over 20% of respondents did not know that hiring others to write some parts of their own paper was considered plagiarism. While significantly more respondents (63.3%) indicated that all forms of plagiarism were unacceptable, 44.4% said plagiarism was unavoidable. Some comments from the respondents suggested that even if they knew plagiarism was not acceptable, they still did it. Perhaps relatedly, 31.3% of respondents said plagiarism should not be penalized after an assignment grade is finalized and released. These trends suggest that plagiarism was likely prevalent among the respondents, despite knowing that it is a punishable act.

Linked to this, this study also highlighted a huge gap between knowing the principles of plagiarism and applying them. Results showed that students’ overall high knowledge level about plagiarism did not translate to their ability to recognize plagiaristic writings. Only 11.6% of participants had a high level of ability to recognize plagiaristic writings. No association was found between their knowledge level and ability to recognize plagiaristic writings ($P=0.109$). Similar results were found in previously published literature in other contexts. In another study conducted to assess whether undergraduate students could determine plagiaristic work, 40 to 50% of students could not correctly identify plagiarized writing samples (Roig, 1997). Other studies have indicated that students who did not receive adequate
preparation in research and writing skills were found to be more likely to plagiarize as they did not learn skills such as referencing and paraphrasing (Babalola, 2012; Warn, 2006). This literature is consistent with our results demonstrating that while students might know plagiarism is wrong in most instances, they are simply not able to recognize it or apply key principles to avoid it. Our study is consistent with the literature in that it highlights that greater attention to plagiarism education is needed, with special emphasis on the actual application to recognize plagiaristic writing and skills in referencing and paraphrasing. In addition to this, approaches to plagiarism education must not only focus on these technical aspects of paraphrasing and citing correctly, but must also focus on the purpose of academic writing, which is knowledge dissemination, and the disciplinary norms and values of this. Students must be made aware that they are producers of knowledge through the academic work they produce at university, and therefore should not write to avoid plagiarism, but write to produce new knowledge.

Previous studies have found that students plagiarize for multiple reasons. As discussed above, they may not know how to reference or cite, or recognize what plagiarism is, but they also may be driven to plagiarism to achieve better academic scores or because they lack academic writing skills (Anderson & Steneck, 2011; Babalola, 2012; Dawson & Overfield, 2006; Ramzan et al, 2012; Warn, 2006). Our results provided similar insights into the reasons students plagiarize. Specifically, over 46% of respondents indicated that they would not change the words of an author who wrote something better than they could write it. Although the official language in Rwanda is English, the most common language used is Kinyarwanda. Adding to the linguistic complexity is that the government officially changed the medium of education from French to English in 2008, and for many citizens, including parents, teachers, and students, English is not their first language. This lower comfort with the language may help explain the desire to use the words of others who express arguments well in English. In addition to this, uncertainty around how to write academically may have been a major contributing factor in this area. Research conducted by Sheridan (2011) into student diversity and academic literacy found that students who are writing in a second or third language express anxiety over their ability to express themselves and struggle to convey complex ideas in their writing. This is an important consideration in our study, particularly when considered in relation to the results indicating that students undertaking a diploma or bachelor degree were less likely to have a high knowledge level or ability to recognize plagiarism. This is the first time these students are exposed to academic writing at the higher education level, and they may face anxiety or struggles over expressing themselves when writing. Plagiarizing by not changing the words of an author could be seen as an “easy way out” and help assuage anxiety and feelings of helplessness when trying to convey complex ideas in an academic environment.

This study has highlighted that students plagiarize because they may lack essential skills and confidence in academic writing. This calls for higher education institutions in Rwanda and across the region to prioritize academic and scientific writing development training for students. This training should not only cover principles of avoiding plagiarism and ensuring academic integrity, for example, how to reference, cite, and paraphrase correctly, as well as what constitutes plagiarism, but it should also cover principles of academic writing. Given that the mode of instruction in Rwandan higher education institutions is English, students should also receive English writing training to build confidence in expressing ideas in a second language. Universities should be cognizant that such training should be integrated when the student first enters higher education at the diploma or bachelor degree level, and early on in their program, as our results showed both the knowledge level and ability to recognize plagiarism were lower among students in diploma/certificate and undergraduate programs, compared to master program students. This foundational training must be combined with practical activities
to promote and reinforce learning to application. As reported in this study, simply knowing about plagiarism does not necessarily mean that plagiarism can be correctly identified. Application of knowledge to practical examples will build students’ confidence in knowing how and when plagiarism occurs, and this can be directly applied to their own writing.

Providing this comprehensive academic writing and how to avoid plagiarism is important for students to equip them to adhere to standards of academic integrity and produce acceptable academic work while at university, but is of particular importance with regard to authorship and publications, as the implications of plagiarism extend well beyond the time a student spends studying in a higher education institution. Studies have shown that researchers in low- and middle-income countries were underrepresented in first and last authorship positions in peer reviewed publications, even within studies conducted in Africa (Hedt-Gauthier et al., 2019; Mbaye et al., 2019; Schneider & Maleka, 2018). A recent systematic review found that less than 50% of the publications related to studies conducted in Africa had an African first or last author; the underrepresentation was even more significant for publications related to studies conducted in non-Anglophone countries (Mbaye et al., 2019). This underrepresentation is an issue of structural inequity; it is also likely that one contributing factor is low- and middle-income country (LMIC) authors’ limited command of English for non-native English speakers and limited training in scientific writing. By enhancing students’ understanding of plagiarism and improving their scientific writing skills scholars in LMICs may elevate their recognition in the publication space.

As such, this study recommends that comprehensive scientific and academic writing training should be instituted in higher education institutions in Rwanda and across similar contexts to promote the importance of academic integrity in scholarly work, improve students’ ability to apply skills to avoid plagiarism, and increase opportunity for publication. In addition to this, higher education institutions should establish policies on plagiarism and enforce strict penalties if plagiarism occurs. Both pedagogical approaches and policy should also be extended to academic faculty, as academic integrity must be enforced at all levels in the academic world. This study presents an opportunity for higher education institutions and other stakeholders in Rwanda, or other similar contexts, to collaboratively establish clear standards, guidelines, and training on plagiarism to increase standards of education, academic writing, and publications across higher education institutions.

The project has successfully accomplished the objectives of this study; however, the results must be seen in light of some limitations. Firstly, the majority of our respondents were from private universities, despite most students in Rwanda attending public universities. In addition to the non-probability sampling method, the results therefore may not be completely representative of the higher education landscape in Rwanda.

Further to this, we did not examine the role of gender in this study. The extent to which gender differences play a role in whether students plagiarize has been inconclusive in previous literature. While some studies found that more males than females cheated or found it acceptable to cheat (Smyth and Davis, 2004; Brown and Choong, 2005; Lin & Wen, 2007), others found no significant difference (Roig & Caso, 2005). As the goals of our study were to assess the overall level of understanding and ability to identify plagiarism among higher education students, given that this has not been studied in Rwanda before, we did not include gender as a variable. Incorporating gender analysis in future studies will enhance the assessment of plagiarism in Rwanda and provide useful insight into the demographics of plagiarism.

Lastly, in our study, we did not identify in what language the respondents received their secondary education. Future studies to examine knowledge of and attitudes towards plagiarism in relation to language may provide more insight into whether speaking English as a second or third language has an impact on plagiarism. Added to this, measuring
the skills of students in English and academic writing may shed light on whether lower skills in English and academic writing is associated with higher levels of plagiarism, which is what previous research in other contexts has suggested.

Future studies to include faculty in the study would provide more insights into the culture of plagiarism at higher education institutions. Further to this, future studies could also examine skill levels of students in relation to academic writing and whether they are able to implement strategies to avoid plagiarism. This would provide further insight into the discussion around the linkages between knowledge of and attitudes towards plagiarism and whether students are able to implement strategies to avoid plagiarism. However, despite the limitations, this study provided important baseline information for future studies and initiatives.

Conclusion

This is the first nationwide study of its kind in Rwanda. Not only will the study results provide the baseline data to inform program design, the study effort itself also presented an opportunity for inter-collegial collaboration to design an appropriate plagiarism standard and training programs. With e-learning becoming more commonly used as technology advances, the development and utilization of an online platform to promote best practices in scholarly writing should be considered.

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Data availability The data that support the findings of this study are openly available in Mendeley Data at http://doi.org/10.17632/46v7bhb7sr.1.

Code availability N/A.

Declarations

Conflict of interest The authors declare no competing interests.

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