Facilitating Conditions and the Use of Plagiarism Detection Software by Postgraduates of the University of Ibadan, Oyo State, Nigeria

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ABSTRACT

Plagiarism detection software is beneficial in detecting plagiarism in research works of postgraduate students. Despite the benefits of using plagiarism detection software, studies have revealed that most students, including postgraduates, do not use plagiarism detection software as expected. This could depend on the provision of facilitating conditions like internet connectivity, training opportunities and electricity. Thus, this study examined facilitating conditions and the use of plagiarism detection software among postgraduates of the University of Ibadan, Nigeria.

A descriptive survey research design of the correlational type was used for this study, with a population of 2143 postgraduates. The multi-stage random sampling technique was used to determine the sample size of 242. The questionnaire was the research instrument, and data was analysed using descriptive statistics.

Results showed that most postgraduates agreed that the university provided facilitating conditions like internet connectivity. The majority of the respondents noted that they used Turnitin monthly. Most of the respondents noted that they used plagiarism detection software to paraphrase their work and check the correctness of the grammar in their documents. The most prominent challenges confronting plagiarism detection software use by most respondents were their inability to afford subscription payment to use the plagiarism detection software and slow internet connectivity. There was a significant positive relationship between facilitating conditions and the use of plagiarism detection software by the postgraduates of the University of Ibadan, Nigeria.

Some of the recommendations for the institution's management include leveraging the vast network of alumni willing to give back to the institution and intervening in the provision of internet connectivity and electricity.

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1. Introduction

A university is a citadel for higher education and research, offering degrees across various disciplines. Postgraduate education, characterised by advanced intellectual activities, aims to equip postgraduates with enhanced knowledge and skills for optimal performance in their respective fields (Alemu, 2018; Okite-Amughoro, 2014). However, the integration of Information Communication Technology (ICT) has transformed postgraduate learning and research, enabling students to access information electronically, raising concerns about plagiarism (Gipp, 2014).

Helgesson and Eriksson (2015) define plagiarism as exploiting another person's intellectual work and passing it off as one's own. This includes using someone else's concepts, procedures, findings, or reports without properly citing the original author. Awasthi (2019), in a review of literature, identifies several types of plagiarism like copy and paste, disguised plagiarism, structural plagiarism, cut and slide, self-plagiarism, unethical collaboration, duplication, repetitive research, replication, misleading attribution and complete plagiarism.

Understanding these categories is essential for students, as each carries distinct implications and penalties. Postgraduates engaging in plagiarism risk academic penalties, tarnishing their credibility and limiting future opportunities. Plagiarism also undermines the quality of research, violating ethical standards and eroding trust within the academic community (Adeyemi & Oluwabiyi, 2013; Abraham & Torunarigha, 2020). Recognising these consequences is vital for postgraduates to maintain academic honesty and integrity.

Several types of plagiarism detection software have been developed to combat plagiarism. Plagiarism detection involves comparing documents for similarity and assigning a numeric similarity score (Graudina, 2017; Mansoor, 2022). It can be manual or electronic, with manual detection being subjective and time-consuming and electronic detection utilising text-matching software for efficiency (Jadhav & Lihitkar, 2021).

Plagiarism detection software employs algorithm-based text detection to identify content similarities across various documents or websites (Meo & Talha, 2019). The various plagiarism detection software available have their advantages and disadvantages. Jadhav and Lihitkar (2021), Ahmed (2015) and Sripathy (2017) identified some including Turnitin, iThenticate, Grammarly, Urkund, Copycatch, PlagAware, PlagScan, Plagium, Plag Tracker, PaperRater, ProWritingAid, Duplichecker, Quetext, SmallSEO Tools, Copyleaks, DMCA Scan, Dustball, Viper and others. These tools differ in their capabilities, user interfaces, and pricing structures, allowing users to choose based on their needs.

Rop (2017) also conducted a case study on the application of plagiarism detection software to enhance research among Nairobi postgraduates and lecturers. Results showed that the use of plagiarism detection software was significantly low. However, the low use of plagiarism detection software could result from the influence of facilitating conditions. Almetere et al. (2020) described facilitating conditions as the belief in the existence of organisational and technical infrastructure to support system use. Similarly, Azalan et al. (2022) defined facilitating conditions as the available infrastructure that supports technology usage. Hence, facilitating conditions are related to the availability of sufficient resources and support for individuals to use technology.

Within the context of this study, facilitating conditions are measured by internet connectivity,

training opportunities and electricity. Lack of internet connectivity could impede the use of plagiarism detection software by postgraduates. In addition, a lack of training opportunities could also hinder the use of plagiarism detection software by postgraduates. Constant electricity supply is also necessary for postgraduates to use plagiarism detection software.

Academic integrity fosters learning and creativity in an institution by giving postgraduates confidence and security as they explore new ideas and concepts. It also encourages students to take risks, think and ask questions without fear of criticism. It also offers opportunities for advancement, as postgraduates with high academic integrity will be able to fit in any organisation and reduce the corruption rate in the country. In addition, academic integrity will encourage creativity and originality among postgraduates, reducing plagiarism-induced sanctions and improving the integrity of the students and their institutions. Therefore, this study examines facilitating conditions and the use of plagiarism detection software among postgraduates of the University of Ibadan, Nigeria.

2. Statement of the problem

Plagiarism detection software is beneficial to postgraduate research as it aids in detecting plagiarised articles or research work. It checks plagiarism and provides editing services to improve the overall quality of articles or research papers. A postgraduate who uses plagiarism detection software will appreciate the value of originality as it will reduce the extent of copied texts and could encourage the student to be creative and innovative while writing. This could give such a student an edge over his or her colleague who does not use plagiarism detection software. Thus, plagiarism detection software enhances originality and promotes academic integrity.

Despite the benefits associated with using plagiarism detection software by postgraduates, studies have revealed that most students, including postgraduates, do not use plagiarism detection software as expected. This could be a function of facilitating conditions as they could either promote or discourage the use of plagiarism detection software. Although some studies have been conducted on the use of plagiarism detection software, few, perhaps none, have studied the relationship between facilitating conditions and the use of plagiarism detection software, especially within Nigeria. Thus, this study, entitled "Facilitating conditions and the use of plagiarism detection software among postgraduates of the University of Ibadan, Nigeria", became imperative.

3. Research questions

The research questions derived from the specific objectives are:
1) What are the facilitating conditions provided by the University of Ibadan to enhance the use of plagiarism detection software by postgraduates?
2) What types of plagiarism detection software are used by postgraduates of the University of Ibadan, Nigeria?
3) What is the frequency of use of plagiarism detection software used by postgraduates of the

University of Ibadan, Nigeria?

4) What is the purpose of use of plagiarism detection software by postgraduates of the University of Ibadan, Nigeria?

5) What are the challenges faced by postgraduates of the University of Ibadan, Nigeria, in the use of plagiarism detection software?

6) What is the relationship between facilitating conditions and the use of plagiarism detection software by postgraduates of the University of Ibadan, Nigeria?

4. Literature review

4.1 Prevalence of plagiarism and relevance of plagiarism detection software

Plagiarism has been a persistent issue in academia. Razera (2011) defined it as using another person's words, ideas, and information without adequately attributing them to the original author. It poses challenges for educators in educational institutions, and with the advent of the Internet, the ease of copying and pasting has only exacerbated the problem. Plagiarism is often equated with cheating, and it is a vice that leads to a corruption of independent and critical thinking, which is crucial for contributing to knowledge (Gow, 2013).

Plagiarism is a global issue that affects students from different cultural backgrounds with varying academic capabilities. While students generally understand the basics of plagiarism, the complexities of the concept can lead to confusion (Idiegbeyan-Ose et al., 2016). Causes of plagiarism include the ease of copying from the Internet, the desire for good grades, pressure to meet deadlines, and ignorance of proper citation principles (Babalola, 2012). Various types of plagiarism exist, such as accidental plagiarism, illegal paraphrasing, aggregation, copy-paste, find-replace, mosaic, pawn sacrifice, self-plagiarism, 404 error, ghostwriting, translation, cloning, and source plagiarism (Stephenson, 2018).

The complexity of plagiarism has led to different perceptions among students. In Ghana, Appiah (2016) reported that among 278 students, their definitions of plagiarism were narrow and that they confused other forms of academic misconduct with plagiarism. Specifically, the majority of the students (82.7%) thought that collusion should be considered plagiarism. However, 64% thought that patchwriting, reproducing work by slightly altering words or grammatical structure, should not be considered plagiarism. Selemani et al. (2018) conducted a study on why postgraduates of Mzuzu University in Malawi plagiarise. Results of the study showed that (63.7%) of the students plagiarise because of laziness and poor time management.

In comparison (54.7%) agreed that they plagiarise due to a lack of academic writing skills, such as citing, paraphrasing, summarising, or writing references. (50.9%) students strongly agreed that they plagiarise because of the pressure to beat assignment deadlines. From the study findings, it could be inferred that students commit plagiarism intentionally and unintentionally.

Efforts to combat plagiarism have led to developing and utilising plagiarism detection software (PDS). Sarwar et al. (2016) defined plagiarism detection software as a tool used to examine an academic work for traces of plagiarism. The PDS does this by text-matching various academic

papers, assignments, and reports against previously published works such as books, articles, and journals. Several types of PDS are available, such as Turnitin, Gradescope, iThenticate, and Docoloc (Anson & Kruse, 2023). These tools use different methods, including grammatical-based, semantic-based, grammar-semantic hybrid, and external plagiarism detection methods. While these tools have become integral in addressing plagiarism, they are not foolproof and may be ineffective with translated or paraphrased text.

Educational institutions worldwide, including the University of South Australia, subscribe to plagiarism detection tools like Turnitin, underlining their significance in maintaining academic integrity. Studies have also shown positive attitudes toward the use of PDS in reducing academic dishonesty (Sarwar et al., 2016).

While PDS plays a crucial role in detecting and preventing plagiarism, it should be used in conjunction with human intelligence (Johnson, 2015). Manual methods are still relevant but are often considered uneconomical and time-consuming. The challenge lies in finding a balance between manual and automated methods to ensure accuracy in detecting plagiarism.

Ultimately, plagiarism remains a prevalent issue in academia, driven by various factors and complicated by evolving methods. Plagiarism detection software has emerged as a valuable tool in addressing this problem, although it requires a nuanced approach when integrated with manual methods. Continued efforts to educate students and faculty about plagiarism and the responsible use of PDS are essential for maintaining academic integrity.

4.2 Use of plagiarism detection software by students of higher institutions

Scholars have researched the use of plagiarism detection software by students of higher institutions in order to stem the tide of the unethical act. Omojola & Oyebamiji (2019) conducted a study on the adoption and use of plagiarism detection software among university students in Oyo State, Nigeria. They found that while most of the respondents (85%) indicated that they were aware of plagiarism detection software, slightly more than two-fifths (47.5%) of the students agreed that they had good knowledge of using it. In comparison (41.5%) have a small usage experience.

This high prevalence of plagiarism recorded among students of all levels and disciplines has necessitated the need to curb this act. This development has led to the creation of plagiarism detection software. Hayden et al. (2021) conducted a scoping review of text-matching software used for student academic integrity in higher education in Canada. The study population was made up of Calgary postsecondary school students. Turnitin was the most frequently used text-matching software (86.0%). SafeAssign (7.0%) and Urkund (2.3%), were the next most commonly used. Other software used were Ephorus, EVE2, Grademark, JISC Plagiarism Detection Service, Scriptum, WCopyfind, iThenticate, MyDropBox, and Veriguide. Similarly, Sharaf and Banu (2021) studied the awareness, perception and attitude of postgraduates in Farook College, Kozhikode, and Kerala, India. The study population included 101 respondents, and a questionnaire was used for data collection. The results of the study on the type of plagiarism detection software used by students were Mendeley (34.48%), Turnitin (61.53%) and Plagscan (34.63%). The study recommended that universities conduct practical workshops on the use of plagiarism detection software.

The use of plagiarism detection software, exemplified by Turnitin, faces notable challenges outlined in various studies. Ayon (2017) highlighted the software's limitations in detecting instances where students copy from printed textbooks or translated books. Additionally, article rewriter tools negatively influence the software's effectiveness (Olutola, 2016). Colligan et al. (2015) reported Turnitin's challenges, emphasising its inability to compare papers with works from the invisible web or online papers in other subscribed databases. Subaveerapandiyan and Sakthivel (2022) underscored the cost barrier and Turnitin's limitations in detecting cleverly paraphrased work. Jiffriya et al. (2014) identified challenges with plagiarism detection tools, including Turnitin. Citation-based detection difficulties and time-consuming processing and report generation were recurrent themes. While considered a leading tool, Turnitin faces criticism for slow reporting times, particularly with larger documents and increased comparisons.

4.3 Facilitating conditions and use of plagiarism detection software by students of higher institutions

Few studies have examined the relationship between facilitating conditions and the use of plagiarism detection software. Krokoscz et al. (2019) investigated plagiarism behaviour among graduate students at the University of São Paulo. They found a gap between students' conceptual understanding of plagiarism and what they do in practice. They felt that while conceptual training in what constitutes plagiarism and authoritative scholarly writing is essential, more innovative measures to curb plagiarism are needed. Thus, training is vital in curbing plagiarism issues, including the use of plagiarism detection software. Walcot (2016) discovered that many postgraduates (80%) find it challenging to acknowledge other people's work properly. In this situation, the students seem unable to assign credit to ideas that are not theirs.

Oyekan (2013) opines that the ultimate solution to change the dynamics that promote plagiarism is to advocate the enactment of policies such as constant workshops on the use of plagiarism detection software. Abduldayan et al. (2019) conducted a study on internet connectivity and the use of anti-plagiarism detection software among 341 undergraduates at the Federal University of Technology, Minna, Nigeria. The study revealed that (42%) agreed that a slow internet connection is a barrier to constantly using plagiarism detection software for their academic articles or papers. The study further suggests that robust internet connectivity should be invested in; this would improve the use of plagiarism detection among students and reduce the plagiarism rate. The availability of internet connectivity is therefore necessary for higher institutions to impede plagiarism and promote the use of plagiarism detection software (Ogunsuji & Fagbule, 2020).

Furthermore, Ajanaku (2019) conducted a study on the utilisation of the Internet by undergraduates of the University of Ibadan, Nigeria. The study aimed to measure the Internet connectivity available to the students and recognise the challenges the students encounter while connected to the Internet facility provided by the institution. The study population comprised 300 undergraduate students, and a questionnaire was used to gather data. From the results obtained, the study recommended that the university provide adequate internet facilities and Wi-Fi connections, which will foster the use of plagiarism detection software among students and improve research and other academic

activities among students. The study also highlighted that erratic power supply affects internet connectivity and the use of electronic devices. In addition, the study suggested that the university should explore alternative power sources and that the government should also work on the erratic power supply. The population of the studies by Abduldayan et al. (2019) and Ajanaku (2019) comprised undergraduates, making this study, comprising a postgraduate population imperative. This is because postgraduates may also face the challenge of internet connectivity with respect to the use of plagiarism detection software.

5. Methodology

A descriptive survey research design of the correlational type was adopted for the study. The population of this study consists of postgraduates of the University of Ibadan, Nigeria. According to the data collected from the Record Office of the Postgraduate College of the University of Ibadan, there are 12,296 postgraduates in the University of Ibadan, Nigeria (Table 1).

Table 1. Population of the study

S/N	Faculty	No. of Postgraduates
1.	Education	865
2.	Social Sciences	263
3.	Arts	182
4.	Pharmacy	23
5.	Public Health	86
6.	Agriculture	304
7.	Technology	204
8	Clinical Sciences	27
9	Economics and Management Science	108
10	Veterinary Medicine	34
11	Basic Medical Sciences	47
	Total	2,143

Source: Record Office of the Postgraduate College of the University of Ibadan.

The multi-stage random sampling technique was used for this study. In the first stage, 60% of the faculties at the University of Ibadan were selected through the balloting method. The selected faculties are Education, Social Sciences, Arts, Pharmacy, Public Health, Agriculture, Technology, Clinical Science, Veterinary Medicine and Basic Medical Sciences. In the second stage, 20% of the departments in the selected faculties were selected through balloting. This selection included 4 departments in Education, 2 in Arts, 1 in Pharmacy, 2 in Public Health, 2 in Agriculture, 2 in Technology, 3 in Clinical Science, 2 in Veterinary Medicine and 1 in Basic Medical Sciences. In the third stage, a sampling fraction of 10% was used to select the sample from the randomly selected departments. The justification for using 10% came from Gay & Airason (2003), who stated

that in descriptive research, 10% of the accessible population should be sampled. Thus, the study's sample size is 242 (Table 2).

Table 2. Sample size for the study

S/N	Faculty	Department	No of postgraduates	Sample size (10%)
1	Education	Adult Education	204	20
		Counselling and Human Development	298	30
		Early Childhood	129	13
		Library, Archival and Information Studies	234	23
2	Social Science	Sociology	263	26
3	Arts	European Studies	79	26
		Philosophy	103	13
4	Pharmacy	Centre for Drug Discovery	23	2
5	Public Health	Preventive Medicine	23	2
		Health Promotion and Education	60	6
6	Agriculture	Agric Economics	165	17
		Agronomy	139	14
7	Technology	Agric Environmental Engineering	84	8
		Industrial and Food Engineering	120	12
8	Clinical Sciences	Bioethics	4	1
		Community Health	22	2
		Otorhinolaryngology	1	1
9	Economics and Management Science	Accounting	108	18
10	Veterinary Medicine	Anatomy	10	1
		Medicine	24	2
11	Basic Medical Sciences	Anatomy	47	5
	Total		1991	242

The questionnaire was the instrument used for data collection. Before administration, the instrument was validated by subject experts in the Department of Library, Archival and Information Studies, University of Ibadan. Data was analysed using the Statistical Package for the Social Sciences (SPPS) version 21. The descriptive statistics of frequency counts, mean, and standard deviation were used to analyse research questions 1-5, while Pearson's Product Moment Correlation (PPMC) was used to answer research question 6.

6. Results

6.1 Questionnaire distribution

A total of 242 copies of the questionnaire were administered to the postgraduates of the University of Ibadan, Nigeria. However, 211 copies were returned and found useful for analysis, giving a

response rate of 87.2% (Table 3).

Table 3. Distribution of questionnaire administration and return rate

Faculty	Distribution	Return
Education	86	81
Social Sciences	26	19
Arts	39	35
Pharmacy	2	2
Public Health	8	6
Agriculture	31	27
Technology	20	17
Clinical Sciences	4	4
Economics and Management Sciences	18	14
Veterinary Medicine	3	3
Basic Medical Sciences	5	3
Total	242	211

6.2 Demographic characteristics of the respondents

Table 4 presents the demographic characteristics of the respondents. Results of the demographic characteristics of the postgraduates showed that most of the respondents, 117 (55.5%), were master's degree students, while 8 (3.79%) were MPhil students. There were more male postgraduates, 128 (60.7%), than their female counterparts, 83(39.3%). The majority of the respondents, 45 (21.3%), were between 30-34 years of age, while the least 4 (1.90%) were 50 and above.

Table 4. Demographic information of respondents

Demographic Characteristics	Freq.	%
Programme		
Masters	117	55.5
MPhil	8	3.79
MPhil/PhD	49	23.2
PhD	37	17.5
Gender		
Male	128	60.7
Female	83	39.3
Age		
20-24	34	16.1
25-29	95	45.0
30-34	45	21.3
35-39	21	9.95
40-44	5	2.37
45-50	7	3.32
50 and above	4	1.90
N=211		

6.3 Answers to research questions

■ **Research question 1: What are the facilitating conditions provided by the University of Ibadan to enhance the use of plagiarism detection software by postgraduates?**

Table 5 presents results on the facilitating conditions provided by the university to enhance the use of plagiarism detection software. Findings revealed that most of the postgraduates agreed that the university provided facilitating conditions like internet connectivity (Weighted = 2.81), training opportunities (Weighted = 2.59) and electricity (Weighted = 2.77). However, the most prominent facilitating condition to most of the respondents was internet connectivity, followed by electricity and training opportunities.

Table 5. Facilitating conditions provided to enhance the use of plagiarism detection software

Statements	SA F %	A F %	D F %	SD F %	Mean S.D.
Internet connectivity					
My institution provides internet connectivity to access plagiarism detection software	73 34.6	59 29.0	45 21.3	34 16.1	2.81 .905
The internet connectivity provided by my university is fast	51 24.2	87 41.2	54 24.6	19 9.0	2.81 .908
I must be in my faculty to access the internet before I can use plagiarism detection software	48 22.7	99 46.9	53 25.1	11 5.2	2.87 .821
The internet connectivity in my university is free for plagiarism detection software use	44 20.9	83 39.3	74 35.1	10 4.7	2.76 .834
Weighted mean					2.81
Training opportunities					
My university organises training on the use of plagiarism detection software	28 13.3	91 43.1	65 30.8	27 12.8	2.57 .878
The training for the use of plagiarism detection software at my university is very practical	45 21.3	71 33.6	64 30.3	31 14.7	2.62 .981
The training organised by the university in the use of plagiarism detection software is free	33 15.6	81 38.4	68 32.2	29 13.7	2.56 .916
My lecturers are involved in the training of plagiarism detection software	37 17.5	77 36.5	72 34.1	25 11.8	2.60 .912
Weighted mean					2.59
Electricity					
There is constant power supply in my university that facilitates my use of plagiarism detection software	55 26.1	88 41.7	55 26.1	13 6.2	2.88 .870
There are alternative sources of power supply in my university to support plagiarism detection software use	37 17.5	105 49.8	47 22.3	22 10.4	2.74 .868
Each time the power breaks down, it is quickly fixed to support academic activities like the use of plagiarism detection software	32 15.2	103 48.8	55 26.1	21 10.0	2.69 .848
In the event of a blackout on campus, the university management informs the community to enable the use of alternative sources to engage in academic activities like the use of plagiarism detection software	49 23.2	77 36.5	68 32.2	17 8.1	2.75 .904
Weighted mean					2.77

Key: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)

■ **Research question 2: What types of plagiarism detection software are used by postgraduates of the University of Ibadan, Nigeria?**

Table 6 presents the responses of the postgraduates on the types of plagiarism detection software used. From the results, most respondents, 85 (40.3%), noted that they moderately used Turnitin. On the other hand, PaperRater 107 (50.7%), Dustbell 101 (47.9%), ProWritingAid 95 (45.0%) and Copyscape 95 (45.0%) were never used by a significant number of postgraduates.

Table 6. Types of plagiarism detection software used by postgraduates in the University of Ibadan, Nigeria

Plagiarism detection software	Very highly used F %	Highly used F %	Moderately used F %	Not used F %	Mean	S.D.
Plagscan	21 10.0	62 29.4	52 24.6	76 36.0	2.13	1.020
Copyleaks	16 7.6	57 27.0	70 33.2	68 32.2	2.10	.943
Quetext	16 7.6	48 22.7	57 27.0	90 42.7	1.95	.980
WhiteSmoke	10 4.7	51 24.2	60 28.4	90 42.7	1.91	.924
Dustbell	26 12.3	37 17.5	47 22.3	101 47.9	1.94	1.072
Copyscape	11 5.2	47 22.3	58 27.5	95 45.0	1.88	.933
Unicheck	26 12.3	36 17.1	59 28.0	90 42.7	1.99	1.046
ProWritingAid	24 11.4	38 18.0	54 25.6	95 45.0	1.96	1.043
Viper	15 7.1	51 24.2	53 25.1	92 43.6	1.95	.982
PaperRater	17 8.1	31 14.7	56 26.5	107 50.7	1.80	.970
Duplichecker	20 9.5	50 23.7	54 25.6	87 41.2	2.03	1.037
Unplug Checker	21 10.0	58 27.5	56 26.5	76 36.0	2.12	1.030
Grammarly	38 18.0	63 29.9	39 18.5	71 33.6	2.32	1.121
Turnitin	16 7.6	43 20.4	85 40.3	67 31.8	2.04	.909
Plag Tracker	17 8.1	41 19.4	73 34.6	80 37.9	1.98	.948
DMCA Scan	45 21.3	58 27.5	38 18.0	70 33.2	2.37	1.153
Quillbot	44 20.9	56 26.5	56 26.5	55 26.1	2.42	1.090

■ **Research question 3: What is the frequency of use of plagiarism detection software used by postgraduates of the University of Ibadan, Nigeria?**

The frequency of use of plagiarism detection software is presented in Table 7. Results revealed that 66 (33.1%) of the postgraduates noted that they used Turnitin monthly. However, slightly more than half of the respondents, 106 (50.2%), never used Viper. In addition, about two-fifths of the postgraduates, 92 (43.6%) and 90 (42.7%), never used PaperRater and WhiteSmoke. The same pattern of results was recorded for Dustbell 89 (42.2%) and ProWritingAid 88 (41.7%).

Table 7. Frequency of use of plagiarism detection software used by postgraduates of the University of Ibadan, Nigeria

Plagiarism Detection Software	Daily F %	Weekly F %	Monthly F %	Yearly F %	Never F %	Mean S.D.
Plagscan	22 10.4	25 11.8	40 19.0	45 21.3	79 37.4	2.36 1.361
Copyleaks	11 5.2	21 10.0	52 24.6	56 26.5	71 33.6	2.27 1.177
Quetext	17 8.1	20 9.5	37 17.5	51 24.2	86 40.8	2.20 1.287
WhiteSmoke	-	17 8.1	39 18.5	65 30.8	90 42.7	1.92 .965
Dustbell	10 4.7	22 10.4	22 10.4	68 32.2	89 42.2	2.03 1.173
Copyscape	5 2.4	29 13.7	39 18.5	58 27.5	80 37.9	2.15 1.145
Unicheck	4 1.9	36 17.1	20 9.5	65 30.8	86 40.8	2.09 1.164
ProWritingAid	10 4.7	28 13.3	39 18.5	46 21.8	88 41.7	2.18 1.239
Viper	7 3.3	19 9.0	25 11.8	54 25.6	106 50.2	1.90 1.129
PaperRater	12 5.7	24 11.4	39 18.5	44 20.9	92 43.6	2.15 1.254
Duplichecker	9 4.3	21 10.0	46 21.8	44 20.9	91 43.1	2.11 1.194
Unplug Checker	1 0.5	25 11.8	57 27.0	44 20.9	84 39.8	2.12 1.084
Grammarly	20 9.5	32 15.2	55 26.1	33 15.6	71 33.6	2.51 1.343
Turnitin	26 12.3	31 14.7	66 31.1	50 23.7	38 18.0	2.59 1.382
Plag Tracker	13 6.2	26 12.3	42 19.9	54 25.6	76 36.0	2.27 1.741
DMCA Scan	7 3.3	24 11.4	48 22.7	50 23.7	82 38.9	2.12 1.161
Quillbot	37 17.5	31 14.7	38 18.0	60 28.4	45 21.3	2.79 1.396

- **Research question 4: What is the purpose of use of plagiarism detection software by postgraduates of the University of Ibadan, Nigeria?**

The purpose of use of plagiarism detection software by postgraduates is presented in Table 8. Results showed that most of the respondents (=3.10) noted that they used plagiarism detection software to paraphrase their work and also to check the correctness of the grammar in their documents. Many postgraduates (=3.09) also noted that they used plagiarism detection software to edit their work. The majority of the respondents (=3.08) also noted that they used plagiarism detection software to determine the level of plagiarism in their work.

Table 8. Purpose of use of plagiarism detection software by postgraduates of the University of Ibadan, Nigeria

Statements: I use plagiarism detection software:	SA F %	A F %	D F %	SD F %	Mean S.D.
in order to paraphrase my work	66 31.3	105 49.8	36 17.1	4 1.9	3.10 .742
to check the correctness of the grammar in my documents	71 33.6	95 45.0	41 19.4	4 1.9	3.10 .774
to determine the level of plagiarism in my work	61 28.9	110 52.1	36 17.1	4 1.9	3.08 .729
to ascertain proper referencing in my work	48 22.7	114 54.0	40 19.0	9 4.3	2.95 .767
to edit my work	64 30.3	105 49.8	38 18.0	4 1.9	3.09 .745
to scan my documents, generally	52 24.6	110 52.1	40 19.0	9 4.3	2.97 .780

■ **Research question 5: What are the challenges faced by postgraduates of the University of Ibadan, Nigeria, in the use of plagiarism detection software?**

The results of the challenges affecting the use of plagiarism detection software by postgraduates are presented in Table 9. Results revealed that the most prominent challenges confronting the use of plagiarism detection software by most of the respondents (=2.61) and (=2.53) were their inability to afford subscription payment to use the plagiarism detection software and slow internet connectivity that hinders the use of plagiarism detection software.

Table 9. Challenges to the use of plagiarism detection software by postgraduates of the University of Ibadan, Nigeria

Challenges	SA F %	A F %	D F %	SD F %	Mean S.D.
I cannot afford subscription payment to use plagiarism detection software	39 18.5	59 28.0	105 49.8	8 3.8	2.61 .828
The interface of the plagiarism detection software is too technical for me to understand	19 9.0	52 24.6	112 53.1	28 13.3	2.29 .810
I do not have the necessary information and communication technology skills to use plagiarism detection software	26 12.3	72 34.1	85 40.3	28 13.3	2.45 .874
Slow internet connectivity hinders me from using plagiarism detection software	38 18.0	59 28.0	90 42.7	24 11.4	2.53 .917
I do not have the time to use plagiarism detection software	22 10.4	59 28.0	82 38.9	48 22.7	2.26 .928
I do not have compatible gadgets to use plagiarism detection software	31 14.7	61 28.9	85 40.3	34 16.1	2.42 .930

■ **Research question six: What is the relationship between facilitating conditions and the use of plagiarism detection software by postgraduates of the University of Ibadan, Nigeria?**

Table 10 presents the results of the correlation analysis conducted to examine the relationship between facilitating conditions and the use of plagiarism detection software by the respondents. Results revealed a significant positive relationship between facilitating conditions and the use of plagiarism detection software by the postgraduates of the University of Ibadan, Nigeria (r=.339**; df =210; p< 0.01). This implies that the more the facilitating conditions like internet connectivity, training opportunities and electricity are provided, the more the postgraduates are expected to use the plagiarism detection software.

Table 10. Relationship between facilitating condition and use of plagiarism detection software by postgraduates in the University of Ibadan

Variables	Mean	Std. Deviation	N	R	Df	Remarks
Facilitating conditions	29.84	6.934	211	.339**	210	Sig.
Use of plagiarism detection software	34.89	13.520				

7. Discussion of findings

Results showed that the most prominent facilitating condition provided to most of the respondents was internet connectivity, followed by electricity and training opportunities. This indicates that the university's management tries as much as possible to ensure that the postgraduates have what they need to use the plagiarism detection software. The facilitating conditions captured in this study, internet connectivity, electricity, and training opportunities, were identified by Thompson (2013) as essential in using internet-based technology. The finding of this study differs from that of Shehu, Urhefe, and Aworo (2015), who carried out a study on accessibility and use of internet services in Nigerian libraries and reported that most participants claimed that they had no access to internet services.

The majority of the postgraduates used Turnitin monthly. However, slightly more than half of the respondents never used Viper, and about two-fifths of the postgraduates never used PaperRater and WhiteSmoke. This also indicates that Turnitin still has an edge over the other types of plagiarism detection software. The findings of this study align with those of Hayden, Eaton and Patrick (2021), who conducted a scoping review of text-matching software used for student academic integrity in higher education in Canada and reported that Turnitin was the most frequently used text-matching software.

Findings showed that most respondents noted that they used plagiarism detection software to paraphrase their work, check the correctness of the grammar in their documents, edit their work, and determine the level of plagiarism. Plagiarism detection software can be used for different purposes as deemed fit by the postgraduates. This agrees with the function of plagiarism detection software, as noted by Sarwar et al. (2016), who stated that plagiarism detection software is a tool used to identify plagiarism in academic work. It aims to identify overlapping content and indicate potential plagiarism by highlighting matching or similar sections.

The most prominent challenges confronting the use of plagiarism detection software by most respondents were their inability to afford subscription payment to use the plagiarism detection software and slow internet connectivity. These constraints can no doubt inhibit the respondents' use of plagiarism detection software. The result of this study corroborates that of Subaveerapandiyan and Sakthivel (2022), who studied the obstacles in subscribing to plagiarism detection software by colleges in Tamil Nadu, India and reported that one of the challenges that hindered the use of plagiarism detection software was the expensive cost of subscribing to the plagiarism detection software.

There was a significant positive relationship between facilitating conditions and the use of plagiarism detection software by the postgraduates of the University of Ibadan, Nigeria. If there is fast internet collection, a stable power supply, and adequate skills to use plagiarism detection software, postgraduates will be motivated to use it more. This result tallies with that of Abduldayan et al. (2019), who conducted a study on internet connectivity and the use of anti-plagiarism detection software among students at the Federal University of Technology, Minna, Nigeria and reported that robust internet connectivity was identified as a factor that could promote the use of the software. Similarly, Adekanbi and Megwaonye (2020) studied the use of institutional policy on Turnitin plagiarism detection software at Nigeria's Premier University, and they recommended that training workshops should be organised

for students on the use of Turnitin software to promote its use.

8. Conclusion and recommendations

Plagiarism is a menace that is ravaging the academic world and can tarnish the image of the ivory towers. In as much as information and communication technology can be used to plagiarise, the same tool can deter individuals, especially students, from plagiarising. This is done through the use of plagiarism detection software, which sends a signal that plagiarism is not tolerated and that plagiarists will not go undetected. If postgraduates who are more into research activities know that the universities have such a provision, they would be careful to uphold the ethics of academic writing.

However, to promote the use of plagiarism detection software, the university management needs to pay attention to facilitating conditions like internet connectivity, training opportunities, and electricity. The more these conditions are favourable, the more motivated the postgraduates will be to use the plagiarism detection software. In an environment where internet connectivity is not available or very slow, the postgraduates are not trained to use this software, and the electricity used to charge their devices is epileptic, they would be discouraged from using it. Thus, facilitating conditions like internet connectivity, training opportunities, and electricity are determinants of the use of plagiarism detection software by postgraduates. Based on the outcome of the study, the following recommendations are hereby presented:

1) In order to improve the provision of facilitating conditions like internet connectivity and electricity, the institution's management should harness the vast network of alumni willing to give back to the institution that made them. Their intervention in the areas of internet connectivity and electricity could go a long way in improving the situation for the better.

2) Additionally, to sustain the organisation of training programmes on the use of plagiarism detection software, the institution's management could incorporate this into the orientation of new postgraduates so that the students can use the skills acquired throughout their programme.

3) Furthermore, the faculty can motivate postgraduates to use plagiarism detection software often by ensuring that assignments are submitted with similarity reports. If the postgraduates know this, their use of plagiarism detection software will improve.

4) In conclusion, to address the challenge of the inability to pay for data subscriptions to use plagiarism detection software, the management of the Postgraduate College should give the registered students access to the university's Wi-Fi connection. The cost of this can be subsidised and incorporated into their school fees.

References

Abduldayan, F., Yusuf, H., & Olatunde, A. (2019). Perception of undergraduates on the use of Turnitin plagiarism checker in Federal University of Technology, Minna, Nigeria. *Covenant Journal of Library & Information Science, 2*(1), 38-54. Retrieved from http://journals.covenantuniversity.edu.ng/index.php/cjlis/

Abraham, O., & Torunarigha, Y. (2020). Academic dishonesty: Examining the causes and consequences of plagiarism in higher educational institutions of learning. *International Journal of Innovative Social Science & Humanities Research, 8*(4), 88-19.

Adekanbi, S. O., & Megwaonye, E. C. (2020). Academics' attitudes to and use of institutional policy on Turnitin plagiarism detection software at Nigeria's premier university. *Journal of Information Science, Systems and Technology, 4*(2). Retrieved from http:arcis.ui.edu.ng

Adeyemi, B. M., & Oluwabiyi, M. (2013). Scholarly use of information for research by postgraduate students: The role of Kenneth Dike Library (KDL), 5(8). Retrieved from https://doi.org/10.5897/IJLIS2013.0366

Ahmed, Rana Khudhair. (2015). Overview of different plagiarism detection tools. *International Journal of Futuristic Trends in Engineering and Technology, II*, 1-3.

Ajanaku, J. O. (2019). Utilisation of the internet by undergraduate students of the University of Ibadan, Nigeria. *International Journal of Science and Technology Education Research, 10*(3), 30-36. Retrieved from https://doi.org/10.5897/ijster2018.0441

Alemu, S. K. (2018). Meaning, idea and history of University/Higher Education: Brief Literature Review. *FIRE: Forum for International Research in Education, 4*(3). Retrieved from https://doi.org/10.32865/fire20184312

Almetere, E., Kelana, B., & Mansor, N. (2020). Using UTAUT model to determine factors affecting Internet of Things acceptance in public universities. *International Journal of Academic Research in Business and Social Sciences, 10*(2). https://doi.org/10.6007/ijarbss/v10-i2/6915

Anson, C. M., & Kruse, O. (2023). Plagiarism detection and intertextuality software. In *Digital Writing Technologies in Higher Education: Theory, Research, and Practice* (pp. 231-243). Cham: Springer International Publishing.

Appiah, M. K. (2016). Incidence of plagiarism among undergraduate students in higher institutions in Ghana. *International Journal of Research in Economics and Social Sciences, 6*(3), 269-279. Retrieved from http://www.euroasiapub.org/

Awasthi, S. (2019). Plagiarism and academic misconduct: A systematic review. *DESIDOC Journal of Library & Information Technology, 39*(2).

Ayon, N. (2017). Students' and instructors' perceptions of Turnitin: A plagiarism deterrent? *Creative Education, 08*(13), 2091-2108. https://doi.org/10.4236/ce.2017.813141

Azalan, N., Mokhtar, M., & Karim, A. (2022). The role of facilitating conditions in e-zakat adoption. *International Journal of Academic Research in Business and Social Sciences, 12*(12). https://doi.org/10.6007/ijarbss/v12-i12/15960

Babalola, Y. (2012). Awareness and incidence of plagiarism among undergraduates in a Nigerian private university. *African Journal of Library, Archives and Information Science, 22*(1), 53-60.

Colligan, C., Joyce, M., Bull, S., & Loyen, C. (2016). Humanities research software design: The Wilde Trials web app. *Scholarly and Research Communication, 7*(2/3). Retrieved from https://doi.org/10.22230/src.2016v7n2/3a256

Gipp, B. (2014). Citation-based plagiarism detection: Detecting disguised and cross-language plagiarism using citation pattern analysis. Springer.

Gow, S. (2013). Plagiarism across Europe and beyond. Shanghai. Retrieved from https://academicintegrity.eu/conference/proceedings/2013/Gow_Cultural.pdf.

Graudina, V. (2007). Computer-based plagiarism detection methods and tools. *Proceedings of the 2017 International Conference on Computer Systems and Technologies - CompSysTech '07.* Retrieved from https://doi.org/10.1145/1330598.1330642

Hayden, K. A., Eaton, S. E., Pethrick, H., Crossman, K., Lenart, B. A., & Penaluna, L.-A. (2021). A scoping review of text-matching software used for student academic integrity in higher education. *Education Research International, 2021,* 1-15. Retrieved from https://doi.org/10.1155/2021/4834860

Helgesson, G., & Eriksson, S. (2015). Plagiarism in research. *Medicine, Health Care and Philosophy, 18,* 91-101. Retrieved from https://aliah.ac.in/upload/media/04-04-20_1585985620.pdf

Idiegbeyan-ose, J., Nkiko, C., & Osinulu, I. (2016). Awareness and perception of plagiarism of postgraduate students in selected universities in Ogun State, Nigeria. *Library Philosophy and Practice (e-Journal).* Retrieved from http://eprints.lmu.edu.ng

Jadhav, S. D., & Lihitkar, S. R. (2021). Plagiarism Detection Software: A Comparative Evaluation. *Library Philosophy and Practice (e-journal).* 6206. https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=11753&context=libphilprac

Jiffriya, M. A., Jahan, M. A., Ragel, R. G., & Deegalla, S. (2014). AntiPlag: Plagiarism detection on electronic submissions of text-based assignments. *2013 IEEE 8th International Conference on Industrial and Information Systems.* Retrieved from https://doi.org/10.1109/iciinfs.2013.6732013

Jiffriya, M., Jahan, M. A., & Ragel, R. (2021). Plagiarism detection tools and techniques: A comprehensive survey. *Journal of Science-FAS-SEUSL, 2*(02), 47-64. https://seu.ac.lk/jsc/publication/v2n2/Manuscript%205.pdf

Johnson, R. (2015). Examining the boundaries between musical borrowing, influence, and plagiarism. Retrieved from https://doi.org/10.17615/2pf8-z714

Krokoscz, Marcelo, & Ferreira, S. M. S. P. (2019c, April 25). Perceptions of graduate students at the University of São Paulo about plagiarism practices in academic works. *Anais da Academia Brasileira de Ciências.* Retrieved from https://www.scielo.br

Mansoor, M. N., & Al-Tamimi, M. S. H. (2022). Computer-Based Plagiarism Detection Techniques: A Comparative Study, *13*(1), 3599-3611. Retrieved from https://doi.org/https://doi.org/10.22075/ijnaa.2022.6140

Meo, S. A. & Talha, M. (2019). Turnitin: Is it a text-matching or plagiarism detection tool? *Saudi Journal of Anaesthesia, 13*(5), 48. https://doi.org/10.4103/sja.sja_772_18

Ogunsuji, O. O., & Fagbule, O. F. (2020). Plagiarism: the curse of internet in African academia? *Annals of Ibadan Postgraduate Medicine, 18*(2), 98.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8369403/

Okite-Amughoro, F. A. (2014). The use of electronic information resources for academic research by postgraduate students at Delta State University, Abraka, Nigeria. *South African Journal of Libraries and Information Science, 80*(2). https://doi.org/10.7553/80-2-1527

Olutola, F. O. (2016). Towards a more enduring prevention of plagiarism. *African Journal of Criminology and Justice Studies, 9*(1), 83-97. Retrieved from https://www.umes.edu

Omojola, O., & Oyebanji, O. (2019). *Journal of Education Review, 11*(2), 86-95. Retrieved from https://www.researchgate.net/publication/352102977

Oyekan, O. (2013). Academic Integrity: Study & Guide. Xlibris. Xlibrispublishing. Retrieved from https://books.google.com.ng.

Razera, D. (2011). (Thesis). Awareness, attitude and perception of plagiarism among students and teachers at Stockholm University. Retrieved from https://www.diva-portal.org/smash/get/diva2:432681/fulltext01.pdf.

Rop, F. K. (2017). Application of Plagiarism Detection Software to Enhance Research: A Case of University of Nairobi Post Graduate Students and Lecturers (Doctoral dissertation).

Sarwar, M., Moin, M., & Jabeen, M. (2016). Role of Plagiarism Detecting Software in Reducing Academic Dishonesty at M.Phil Level. *The Dialogue, 11*(4), 414. Retrieved from https://link.gale.com/apps/doc/A480607986/

Selemani, A., Chawinga, W. D., & Dube, G. (2018). Why do postgraduate students commit plagiarism? An empirical study. *International Journal for Educational Integrity, 14*(1). Retrieved from https://doi.org/10.1007/s40979-018-0029-6

Sharaf, N., & Banu, K. (2021). Plagiarism: Awareness, perception and attitude of research scholars in Farook College, Kozhikode, Kerala, India scholars in Farook College. *Library Philosophy and Practice.*

Shehu, H., Urhefe, A., & Aworo, P. (2015). Accessibility and Utilisation Of Internet Service In Nigeria Libraries: An Empirical Study. *International Journal of Academic Research and Reflection, 3*(5), 78-89.

Sripathy, T. (2017). Plagiarism Detection Softwares and their useful applications to Indian Researchers, Teachers, Writers & Students: Literature Review. *International Journal of Advance Research in Science and Engineering, 6*(8), 1497-1502. http://www.ijarse.com/images/fullpdf/1503324393_IETEbanglore645.pdf

Stephenson, S. (2018). Plagiarism Conference, Turkey. Retrieved from http://academicintegrity.eu/conference/wp-content/files/presentation18/Stephenson.pdf.

Subaveerapandiyan, A., & Sakthivel, N. (2022). A study of obstacles in plagiarism software subscribing by colleges in Tamil Nadu. *DESIDOC Journal of Library & Information Technology, 42*(5), 318-324. Retrieved from https://doi.org/10.14429/djlit.42.5.18273

Walcott, P. (2016). Attitudes of second-year Computer Science undergraduates toward plagiarism. *Caribbean Teaching Scholar, 6*, 63-80.

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