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Comparative analysis of anti-Plagiarism tools: Turnitin and others

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Abstract
This paper gives a basic understanding of plagiarism and the research guidelines along with the comparison of anti-plagiarism tools. It also tries to find the reasons for popularity of Turnitin among the research community. The paper found that some of the tools are better in performance as compared to others in few parameters of comparison while other tools are preferred in some distinct criteria. Turnitin that stores the uploaded contents automatically increasing its database and the feasibility to researchers has been the popular amongst the various anti-plagiarism tools due to such features. To make it more user friendly, a few suggestions are also given by this paper.

Keywords: Plagiarism, software, tool, turnitin, research, matching text

Introduction
Plagiarism is defined as an act of presenting someone else's work as own work. This is an offence in academia as it is a breach of ethics and an act of academic dishonesty [1]. As per UGC Regulations 2018, there are four levels of plagiarism. Plagiarism at level 0 is similarities up to 10% and this is called minor similarities with no offence. Plagiarism at level 1 is similarities of the range 10-40% which entails the academic body to ask the student to submit a revised script within a stipulated time. Level 2 of plagiarism is the similarities of 40-60% that attracts the punishment of one-year debarment from submitting the revised script while above 60% similarities is defined as level 3 of plagiarism that entails the registration of the student to be cancelled in the program. While in academia and research publications, the offender of level 1 to 3 will be asked to withdraw the manuscript with denial of one-year increment and supervising role in level 2 and denial of two-years increment and supervising role in level 3 offence.

Plagiarism is a problem increasing in the students of post-graduation and graduation [2]. Researchers plagiarize because of poor research skills, poor citation skills, poor time management, improper guidance, poor knowledge of plagiarism and academic integrity, sub-standard writing skills etc [3]. Removing all these issues in researchers and helping them with the awareness about the appropriate referencing and citation can help in avoiding plagiarism. "Anti-plagiarism tool is defined as the software that gives an analysis of the duplicate textual contents. The software just detects the plagiarism and does not correct it. It can either be an application based or app based. Researchers may use the software to check the plagiarizing of their works as well and a university tries to prevent the plagiarizing of the works by its students." [4]. There are many plagiarism detection tools in the market which are not free like iThenticate, Grammarly, Blackboard, Academic plagiarism, PlagiarismDetect.org and Turnitin [5]. There are many open-access plagiarism tools as well like Plagscan, Plag Tracker, Plagium, Plagiarisma and Dupli checker [6].

[1] Chapter 10, Academic Integrity and Research Quality, University Grants Commission (2021)
[2] Whittle (2008)
[3] Meo and Talha (2019)
[4] www.pcmag.com
[5] Dr B Sutradhar (2018)
[6] Ibid.

Turnitin is a software that checks the similarity index from internet sources which are publicly accessible; published books, journals, proceedings etc. and student submissions on turnitin. It doesn't cover in-house repositories, in-house databases and unpublished articles. Turnitin has some advantages like easier to submit the research and publication works, instant receipt of submissions and feedback through same interface [7]. Turnitin differentiates the similarity level in different colors- blue representing no matching words, green representing 1% to 24% similarity index, 25% to 49% similarity index in yellow color, orange highlighting 50% to 74% while red outlines the similarity index above 75% [8]. This color coding is to be interpreted with academic judgements to get the originality report of the research and publication work.

Comparison of various anti-plagiarism software

There are various software for plagiarism checking with most of them being chargeable. There is a wide variation in terms of content checking, languages supported and the databases. Some of the tools are compared in Table 1 and Table 2 with distinct features.

The two tables of comparison suggests that there are many major criteria which give advantage of some other anti-plagiarism tools over Turnitin like Urkund is preferred in analysis time. Turnitin has the limitation of data contents as well which makes other competitive tools as better options over it. There are many alternatives to Turnitin with few of those being listed below with their basic features.

PlagAware

It detects and scans plagiarism using classical search engine. It has 3 application fields. First, it allows its users in cases of possible content theft, to have an automatic observation of own contents. Second, it is used for analysing students' academic documents and the corresponding plagiarism. Third, it provides proof of authorship which gives the authors additional competitive advantage increasing the academic value of their research work. Moreover, it also has features of multiple documents comparison. German is its primary compatible language while English and Japanese are the secondary languages supported.

PlagScan

This software is compatible for all languages of Arabic and Latin characters along with the languages using international UTF [9]-8 encoding. It uses complex algorithms to detect plagiarism. It tracks its vast databases and the various online documents for detection of plagiarism. Like many other anti-plagiarism tools, it too is used for comparison of multiple documents.

CheckForPlagiarism.net

It has used document source analysis and document fingerprint to protect documents in cases of plagiarism. Document fingerprint is done through numerical attributes. This has an advantage over other tools in terms of synonyms and sentences search. It means that manipulation of sentences and improper paraphrasing can be detected using this tool. The other advantage of this tool is that it checks plagiarism against the documents which are now not available online after its removal. It supports major European languages like Spanish, French, Italian, German, Portuguese along with Korean and Chinese.

iThenticate

It supports more than 30 languages. This allows to check correct citations and originality of contents up to 25000 words. Like CheckForPlagiarism.net, it also detects the plagiarism from the contents which are removed from the websites like some essays or articles. It also helps in comparison of multiple documents. Like most of the tools developed so far for the detection of plagiarism, it too checks against the available local databases in addition to the online contents. This does deep searching for publication and internet checking as compared to the other anti-plagiarism software tools.

PlagiarismDetection.org

This helps in quick detection of plagiarism with higher accuracy level as compared to other tools. It supports English and all languages that use Latin characters. Like other anti-plagiarism tools, this too is competitive in cases of internet, publications and databases checking. This doesn't support the comparison of multiple documents. Being popular among students and teachers, it has a good database of submitted assignments as well.

With the above insights, it can be said that depending upon the requirements of the users, the appropriate and most suitable anti-plagiarism tool can be used. Some tools perform better in one language while the other in some different language. For German language, Turnitin detects plagiarism the best while Urkund does so in Slavic and PlagScan in Romanic languages [10]. Bailey (2020) remarked from his research analysis that Turnitin along with Urkund and PlagScan are the best tools on the criteria of usability and coverage. Even in terms of cost advantage the users prefer the less suitable tools and this limits the scope of plagiarism detection and is a concern for the research community as a whole. The researchers have also found that turnitin acts as plagiarism deterrent as there is low intentional plagiarism, copied texts or matching contents in turnitin users' contents as compared to non-turnitin users [11].

Suggestions for improvement of turnitin

Halgamuge (2017) suggests some of the ways to improve the turnitin software. It is listed as

(a) The matching speed can be made faster to help students check the plagiarism report quickly before submission.
(b) The matching of contents needs to improve so that referenced citations are taken care of.
(c) The software can be improved to avoid paraphrased or direct quoted texts as plagiarised work.
(d) The options for file submissions can be made more extensive and multiple file uploads can also be allowed to make the plagiarism check for students more feasible.

In addition to the suggested improvements, turnitin can also increase the file limit of 40MB contents and the page limit of 400 pages which would make the plagiarism check by the students and academia far more accessible. The turnitin also needs to improve its similarity detection for the contents with appropriate citations as detects the contents of single and double quotations with due credit given to the referred contents.

[7] Ibid.
[8] Ibid.
[9] Unicode Transformation Format
[10] Jonathan Bailey (2020)
[11] Paul Stapleton (2012)

Table 1: Basic comparison of anti-plagiarism tools

Software	First public release	Latest stable version	Deployment Options	Scripts supported	License	Notes
Copyscape	2004		SaaS	Latin	freemium	Targeted at website managers.
Grammarly		2016	SaaS	Latin	freemium	Checks against public web pages and ProQuest databases.
HelioBLAST			(free of charge web service)	Latin	-	Checking against titles and in Medline/PubMed. Submissions are limited to 1000 words.
iThenticate	2004	2017	SaaS	Latin	proprietary	
PlagScan	2008		SaaS, On-Premises	Cyrillic, Latin & Arabic	limited	Submissions are checked against a private shared repository, public online documents and the user's own private repository.
PlagTracker	2011		SaaS	Cyrillic, Latin	freemium	Plagiats Portal rated as Useless for academic purpose
Turnitin	1997		SaaS	Latin & multiple scripts through translation	proprietary	Automatically stores uploaded contents and texts to its database
Unicheck	2014	SaaS	SaaS	Cyrillic, Latin	proprietary	Pricing per page based on 137.5 words per nominal page.
Compilatio	2005	2022	SaaS	Arabic, Latin	proprietary	Provides anti-plagiarism software for students, teachers, institutions and writing professionals

***Source*:** Wikipedia

Table 2: Comparison of some plagiarism tools with turnitin

Serial numbers	Particulars	Urkund	Viper	iThenticate	PlagScan	Turnitin
1.	Scope of search	Journals, Online books, Websites, Internet, News, Student Database	10 billion sources of Journals and books	Journals, Books, Web pages, Standard blogs, Scholarly content items, conference proceedings, online news etc.	Journals, Web documents, Internal archives (Internet with 14 billion digital content)	Journals, Web pages, Student papers databases etc.
2.	Supporting other languages	Yes	56 languages	Yes	Yes	19 languages
3.	File format	PDF, PPT, HTML, MS Word, txt etc.	PDF, MS Word, Open Office and Google docs format	PDF, PPT, HTML, MS Word, etc.	Yes	HTML, PPT, RTF, MS Word, PDF, Word XML
4.	Analysis of time	Fast	Average premium scan time less than 30 seconds	Average	Average	Average
5.	Bulk uploading	-	One at a time	-	-	Yes
6.	Direct matching of source and URL of the source provided	Yes	Yes	Yes	Yes	Yes
7.	Interpretation of Plagiarism score	Yes	Yes	Yes	Yes	Yes
8.	Plagiarism report-downloadability	Yes	Yes	Yes	Yes	Yes
9.	Checking against own work	-	Yes	-	Yes	Yes
10.	Citation verification	-	-	-	-	Yes
11.	Limitation of data or pages	-	-	400 Pages or 40 MB	-	400 Pages or 40 MB maximum
12.	Availability for various categories of users	Yes	Yes	Yes	Yes	Yes
13.	Availability for single user	No	Yes	Yes	Yes	Yes
14.	Support	Yes	Yes	Yes	Yes	Yes
15.	API [12] & Plug-In[13]	Yes	-	Yes	Yes	No

***Source*:** Chandere, Satish and Lakshminarayanan (2021)

[12] Application Programming Interface- Bridge between different devices and software.
[13] A software component adding specific features in existing program.

Conclusion

Although there are many anti-plagiarism detection tools, there is no ideal software or tool in wholesome. The distinct advantages and limitations of the various available tools makes the concerned user to choose the most suitable one. There is a need to universalise the language base of all the tools. There are many compatible languages to some anti-plagiarism tools, but the extent of their performance is not up to the level of corresponding performances in the leading global languages of research [14].

Various researchers have pointed out the issues of tools with poor performances in translation and paraphrasing plagiarisms detection [15]. None of the anti-plagiarism tools are good performers for translation plagiarism [16]. Moreover, the detection of paraphrasing plagiarism [17] is also a concern for the research world where the original content is just altered to avoid the plagiarism detection and question the research ethics of the offender. Thus, although there has been the popularity of Turnitin and Urkund for plagiarism checking but there is a need of upgradation in areas of their limitations to make it more conducive for research. There is also the need to aware the research community of the various techniques of plagiarism detection tools. The research community also needs to understand the areas of unethical research practices and the corresponding penal provisions. The researchers must also adhere to the global norms set for copyrights, patents and other related areas of research. These intakes will help in having ethical research community throughout the globe.

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[14] Jonathan Bailey (2020)
[15] Ibid.
[16] Plagiarism when the contents are translated to different language to avoid detection and hide the originality
[17] When proper credit is not given to the originator of the content