



Plagiarism Level Analysis of Online Take-home Examination Results and Its Correlation with Doctoral Program Students' Learning Outcome

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Cheating behaviour in exams in the form of plagiarism occurs in school and college education. Academic fraud is common at the higher education level at the undergraduate, master's level, and even at the doctoral level. Academic fraud is getting out of control and is difficult to eradicate on examinations carried out on-line without strict supervision. The purpose of this research was to reveal the level of academic cheating in the form of plagiarism and its correlation with the results of the mid and final test of the Doctoral program, which was conducted in the form of an on-line take-home examination. This research use a correlation analysis technique with a simple regression test. The sample was determined by purposive sampling technique, amounting to 101 students of 2018, 2019, and 2020 classes who took the 2nd-semester learning technical analysis and development courses. The plagiarism level of the mid and final-semester results was tested using Turnitin. This research found that the level of plagiarism in the form of an average similarity index in the mid-semester are at the intermediate level; medium level internet resources ; publication at a low level; and middle-level student papers. Meanwhile, at the end of the semester, it is known that the similarity index is at the intermediate level; medium level internet resources ; low level publications, and student papers at the intermediate level. Furthermore, the results of this study also reveal that there is a positive and significant correlation between index, internet source, and student papers with the results of mid-semester exams, except for the source of publication plagiarism. Meanwhile, there is only a positive and significant correlation between the source of student paper plagiarism and the examination of the results for the final semester exams. In contrast, the similarity index, internet sources, and publication did not find a significant relationship.

Keywords: plagiarism, on-line examination, take-home examination, study result, doctor student

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INTRODUCTION

Academic cheating has become a phenomenon in various educational institutions around the world, including higher education. Plagiarism, which is a form of academic fraud, is found at the undergraduate and master level and carried out by Doctoral program students. The research results by Hosny & Shameem (2014) reveal that 52 % of master students have replaced other people's words with their language without citing the source and 32 % of students use someone else's exact sentence without citing the source. Arwendria (2019); Darmansyah (2020) revealed that the average similarity index for Doctoral program students' exam results was 38.45 %.

In general, academic dishonesty can be divided into three main categories: cheating, plagiarism and collusion (Moon, 2006). When technology is widespread, plagiarism from internet sources is the main choice for those interested in cheating. The Internet has a very large wealth of information and is easily accessible to answer exam questions. In today's digital era it is easier to access the Internet in their lives, literature has revealed that in recent years, more and more young people are practising cheating, and it is becoming more and more worse every year (Ma et al, 2008; Arwendria, 2018). Stricherz (2001) found that the internet was an important resource for students and more than half of the 4500 students reported plagiarizing sources online. Wang (2017) also found that 80% of students believed that the Internet had made the problem of plagiarism more serious with 75% of students reporting that the online environment made it easier for them to cut and paste material.

Academic cheating, as revealed above, is carried out in various ways, but the aim of students is the same, namely to get high scores without the need for maximum effort. Ferro & Martins (2016) stated that students usually realize that obtaining and creating their assignment material is wrong, but they feel that the possibility of being caught and the risk is relatively small. Franklyn-Stokes & Newstead (1995) revealed that poor time management on the part of students and their desire to get better grades are the main motivation for plagiarism.

Moreover the results of the same study also revealed Devlin & Gray (2007) lack of time, poor time management, laziness, and ease of copy access provided by ICT and Internet are the first order factors to explain this practice; and Akbulut et al. (2008) rediscovered that lack of time and desire to get good grades are personal factors associated with academic plagiarism. The Internet as a 'source of resources' or 'library library' is no longer a metaphor; In addition, it has become a reality that affects all fields based on the exchange of information, placement of content, and access and production of knowledge. (Comas-Forgas & Sureda-Negre, 2010). Learning outcomes like this are dangerous for them because of the process of acquiring knowledge, skills, and impurities through hard work in learning. The learning achievement obtained does not reflect the competence mastered but the result of copy-paste from illegal sources.

Academic cheating, regardless of its form and type, is certain to hurt student life. Academic fraud, which violates morals and ethics, will be carried into their lives after graduating and living in society. The implication, according to Chang et al. (2015), the

occurrence of plagiarism seems to be considered an ethical failure. That is, if plagiarism occurs, the normal academic ethics of hard work, individual effort, and recognition of other people's work have failed, leading to a culture of cheating. According to Magnus et al, (2002), there is an association between the level of college cheating and the country's corruption index in cheating culture. . The results of the same study were also expressed by Orosz et al, (2018) that there is a strong relationship between academic dishonesty and the level of corruption of a country. Laduke (2013) revealed that students who engage in dishonest activities in an academic context, particularly undergraduate students, are more likely to exhibit inappropriate behavior during social life and vice versa.

From this point of view, individuals who are accustomed to cheating in college have a higher probability of doing so in the professional and work fields (Harding et al., 2004). Plagiarism causes many problems in terms of ethics and morals, both while studying and after entering the world of work. Cheating behavior causes the assessment of competency achievement to be biased. The learning outcomes obtained by students are doubtful because it is not the result of thinking but plagiarism by copy-pasting from illegal sources.

There have been many attempts to combat academic fraud, especially plagiarism. The approach to academic integrity offers a working conceptual framework, but there is still a need to define concrete behavioral characteristics such as; speaking the truth, obeying classes and assignments, carrying out activities on Its own, following instructions given, giving answers on exams with only approved materials, citing and giving credit for the work of others, and collaborating fairly during teamwork assignments (Anderson & Arsenault, 2005).

However, it did not work because the challenges of developing information and communication technology were increasingly sophisticated. Building a relationship between the level of corruption in a country and the level of academic dishonesty in its educational institutions is a difficult task to undertake because fraud and corruption have many different forms and causes, especially in complex contexts such as the social dynamics of a country (International Transparency, 2017). Learning and examinations carried out online opened up opportunities for students to plagiarize because it was relatively unsupervised. McNabe & Olmstead (2009) found that about a third of undergraduate students believe that online learning is most conducive to cheating. Especially if the exam questions were designed only using superficial questions, low cognitive levels would make it easier for students to copy answers from the internet. The solutions offered are many and varied. Nevertheless, often find it difficult because the characteristics of online learning are not supportive. Such strict supervision cannot be carried out because the exam is independent of utilizing information technology.

The most rational way that is considered is by raising awareness in the form of appeals and warnings not to cheat. Fostering student ethics and morals through the awareness that academic fraud is dangerous and will cause problems in the future. Educators can make awareness through a persuasive approach through the learning process. Yang et al. (2013), surveying students in mainland China and Taiwan, revealed that comprehensive

academic education, integrity, and increased student academic awareness and punishment can effectively reduce dishonesty. Other strategies include combining punishment with parental responsibility to build ethical models for their children and using peer culture as a tool to combat digital plagiarism (Hosny & Shameem, 2014). Moral development will positively influence the level of academic cheating especially based on learning. Students are especially concerned about teaching "universal moral values" (Davis et al., 2009). Some authors have even suggested that 'academic honesty courses' should be included in student training (Voelker et al., 2011).

Educators can do awareness through the design of exam questions using *Extenics techniques*. Chang et al. (2015) revealed the design of exam questions to reduce the level of academic cheating in exams applying theory *extenics* using three pathways; 1) elements; 2) criteria; and 3) domain of discourse. Wang et al. (2017) examined cheating involving information technology (internet) and a monitoring system in the exam script. This research aims to reveal the level of plagiarism for answers to mid and final tests carried out online in a public university Doctoral program course in West Sumatra, Indonesia. Specifically, what is researched is 1) how big is the level of the similarity index, internet sources, student papers, and publications; and 2) how big is the correlation coefficient between the source of plagiarism and the results of the *Mid Test* and *Final Tests*.

METHOD

The sample of this research is 101 students of the Doctoral program at the Universitas Negeri Padang - Indonesia, consisting of 32 batches of 2018, 35 students of 2019, and 34 students of 2020. The quantitative research method *ex post facto* uses correlational techniques with simple regression analysis to measure Turnitin's plagiarism level. The lecture process in the January-June semesters of 2018 and 2019 applies a guided inquiry learning model with face-to-face meetings. In January-June 2020, continue to use guided inquiry online. Meanwhile, the *Mid Test* and *Final Test* are carried out in an online take-home examination, which is sent via a special email. The exam answers are returned to the lecturer one week later via email. The *Mid Test* is held on the 9th week, and the *Final Test* is in the last week of 16 lectures for one semester.

Data about the answers to the online *Take-home Mid* and *Final Test* of Doctoral program students in batches of 2018, 2019, and 2020 (semester 2) in the course "Development Analysis and Implementation of Learning Technology" is taken from an email file sent by students one week after completing the exam. Data on the percentage of plagiarism on the mid and answers were *Final Test* obtained from the results of Turnitin testing, which focused on four components, namely similarity index, internet sources, publications, and student papers. Learning outcomes only choose a distributed cognitive domain from C1 to C6 obtained from direct assessment of essay questions sent by students on a scale of 0-100. This research uses descriptive statistics to explore the characteristics of the research population and is tested with inferential statistics. The statistical data reported is the Standard Deviation (SD) and mean value (M).

Data normality testing with *Kolmogorov-Smirnov* at $p \leq 0.05$ obtained a statistical significance value =, 000 (Mishra et al., 2019). Data for each variable is normally distributed. The correlation between the level of plagiarism and learning outcomes uses Product Moment with a simple regression test. The grouping of plagiarism levels in the form of similarity numbers (%) using the Turnitin test stated (1) there is no similarity 10%; low level of 11-24%, medium level of 25-49% similarity, and high level of similarity is 50-74% or 75% similarity.

FINDINGS

The research results displayed are a summary of descriptive statistical analysis and the level of plagiarism in the form of similarity index, internet sources, publications, student papers, and study results of mid-semester exams (Table 1). Next, a summary of the results of the simple correlation analysis of the plagiarism level and the results of the mid-semester exam is shown (Table 2), and the correlation of the plagiarism level with the results of the final semester exam results (Table 3).

Table 1

Description of statistics and plagiarism levels on *Mid Test* and *Final Test* (N = 101)

No	Source plagiarism and learning outcomes	Description of statistics							
		Max		Min		Mean		SD	
		Mid	Final	Mid	Final	Mid	Final	Mid	Final
1	Similarity index	66 %	56 %	8 %	6 %	38.44 %	31.53 %	13.72	12.06
2	Internet sources	64 %	52 %	7 %	5 %	36.42 %	29.54 %	14.17	12.33
3	Publications	17 %	30 %	2 %	0 %	7.25 %	7.79 %	3.52	6.17
4	Student papers	48 %	46 %	5 %	4 %	25.38 %	25.47 %	9.87	11.20
5	Learning outcomes	100	100	62	53	86.47	88.54	8.44	8.50

The results of checking the level of plagiarism on students' mid-test answers using Turnitin obtained an average percentage of the similarity index (38.44 %), and internet sources (36.42 %), publications (7.25 %), and student papers (25.38 %), and learning outcomes 86.47. Meanwhile, the answers to the results *Final Test* found an average percentage of similarity in number similarity index (31.53%) and internet sources (29.54%), Publications (7.25 %) and student papers (25.47 %), and learning outcomes 88.54.

The similarity index for the *Final Test* (Table 1) is significantly lower than that of the *Mid Test*. It means that there is a decrease in plagiarism on the *Final Test* compared to the *Mid Test*. The same findings were also found on the internet source, student papers. While the percentage of similarity from the plagiarism source publications is not only very small, there is also no significant difference between the *Mid Test* and the *Final Test*. Meanwhile, there is an increase in the results on the *Final Test* compared to the *Mid Test*.

Table 2

Summary of the correlational analysis results mid-semester and significance test (N = 101)

No	Source plagiarism	Correlation coefficient	t Test results		Conclusion
		Mid semester test results	t _{count}	t _{table}	
1	Similarity Index	0.4345	2.7291	1.6939	t _{count} > t _{table} Significant
2	Internet Sources	0.4388	2.7623	1.6939	t _{count} > t _{table} Significant
3	Publications	0.0834	0.4733	1.6939	t _{count} < t _{table} not significant
4	Student Papers	0.3250	1.9440	1.6939	t _{count} > t _{table} Significant

Correlation of sources of plagiarism with results exams *Mid Test* students' were analyzed to determine how strong the relationship between the two was. Table 2 the summary of the analysis results, reveals a significant correlation with the similarity index with the results of the *Mid Test* with the correlation coefficient $r = 0.4345$ (t_{count} > t_{table} = significant). The level of plagiarism on internet sources also has a positive and significant correlation with the results of the *Mid Test* ($r = 0.4388$). The source of plagiarism student papers has a correlation number of 0.3250, which is also significant. Meanwhile, the level of similarity to the sources of plagiarism publications does not correlate with the results of the *Mid Test* ($r = 0.0834$). The results of the correlational analysis with simple regression (Table 3) have passed the analysis requirements test, namely the normality and homogeneity test of the data.

Table 3

Summary of the *Final Test* semester correlational analysis results and significance test (N = 101)

No	Source plagiarism	Correlation coefficient	t Test Results		Conclusion
		Results <i>Final Test</i>	t _{count}	t _{table}	
1	Similarity Index	0.0676	0.3834	1.6939	t _{count} < t _{table} Not Significant
2	Internet Sources	0.0789	0.4476	1, 6939	t _{arithmetic} < t _{table} Not Significant
3	Publications	0.0973	0.5528	1.6939	t _{arithmetic} < t _{table} Not Significant
4	Student Papers	0.2903	1.7161	1.6939	t _{arithmetic} > t _{table} Significant

Table 3 explains the correlational analysis results of the level of similarity between the sources of plagiarism and the results of the *Final Test* semester. The correlation analysis results revealed a correlation between the insignificant similarity index and the results of the *Final Test*, the correlation coefficient $r = 0.0676$ (t_{count} < t_{table} = insignificant). Internet Sources ($r = 0.0789$) are also not significantly correlated with the results of the *Final Test*. Meanwhile, the similarity level of the sources of plagiarism *publications* does not correlate with the results of the *Final Test* ($r = 0.0834$). ($r = 0.0973$). Meanwhile, it was found that the source of the plagiarism of student papers was significantly correlated with the results of the *Final Test* with a correlation coefficient of 0.2903.

DISCUSSION

The similarity index analysis shows that the level of similarity in student answers for both the *Mid Test* (38.44 %) and the *Final Test* (31.53 %) is still classified as medium.

Various studies have studied the factors that can contribute to the tendency to cheat and plagiarize. The plagiarism category adopted by Ison (2012) based on the recommendations of Bretag & Mahmud (2009) and iParadigms (2012) is used to classify the level of plagiarism if the similarity index $\leq 10\%$ indicates little or no evidence of plagiarism, low rates of 11-24%, intermediate levels of 25-49% similarity, and high levels of plagiarism if the similarity is 50-74% or $\geq 75\%$ similarity. It means that the level of plagiarism carried out by students in answering the exam is in the middle-level category.

Many factors cause academic cheating in examinations. These factors can be classified into three (3) categories: demographic, social and technological, and situational (Harding et al., 2001). Social and technological factors that can increase the likelihood of cheating and plagiarism include lack of awareness, peer culture, lack of punishment, absence of risk, and pressure to achieve (Ma et al., 2007). Also, the use of the Internet for task completion was found positively correlated strongly with plagiarism (Eccles et al., 2006). The level of similarity middle is already foreseeable that the conditions of exams online allow students to commit fraud because it was done without any supervision on the implementation of the test.

In this context, the exam take-home was given one week to solve the questions at home by giving freedom to students to answer questions. Thus students commit cheating not because of the short time on the exam but more due to situational factors (Sheard et al., 2003; Razera et al., 2010). Students feel their work is boring, afraid of failures, lack of training, and maybe pressured by insufficient time for study and heavy workload. The results of other studies (Hosny & Shameem, 2014) reveal that 83.48% of students often or sometimes use electronic resources as a source of plagiarism. From the perspective of environmental advocates, technology is the primary means of promoting academic fraud (Stogner, 2013).

However, the research results by Sullivan et al. (2016) believe that digital technology is a conduit for academic fraud, and the use of technology itself cannot significantly influence academic cheating. New educational and instructional technologies are now replacing traditional. These new technologies are doing much more than simply delivering regular lectures (Elsaadani, 2013). However, trends and issues related to integrating ICT into the curriculum in the teaching and learning process can be explored by future research by new generations of lecturers (Hue & Jalil, 2013).

Integrating other successful education procedures with online learning may prove useful and enhance learning outcomes (Aghajani & Adloo, 2018). However, another condition that provides students opportunities to plagiarize is exams that use the system *electronic online* resource-based. Technology has become a major cultural communication tool and, although it offers better access to a variety of ideas and information, it also provides opportunities for ideas and information to be misrepresented (Howard & Davies, 2009). It appears that the source of the plagiarism student papers does not change between the *Mid Test* and *Final Test* because there is no need to refer to references. It is recognized that authorship may become blurred because of the many ways to access information (Moorman & Horton, 2007). Students have frequent

experiences with different internet search browsers, social media, social networks, and multimedia tools outside of the academic environment, making plagiarism easy.

Based on the type of plagiarism sources, it can be stated that internet sources and student papers are classified as medium level compared to publications. Table 1 above reveals that internet source is categorized as intermediate level (*Mid Test*: 36.42 %; *Final Test*: 29.54 %), and student papers can be stated at the intermediate level similarity, but the two exams have scores that are not much different (*Mid Test*: 25,38%; *End Test*: 25,47%). Sources of plagiarism from publications categorized as very low, and there is no significant difference between the *Mid Test* (7.25%) and *Final Examination* (7.79%), which are both stated to have no similarity.

Therefore, based on the data from the plagiarism source above, it can be stated that students plagiarize with copy-paste from internet sources because the sources are abundant, and there is no need to mention the source. However, according to the theory (Bailie & Jortberg, 2009), (King et al., 2009) behind the fraud involved a fraud triangle based on three elements, namely incentives/pressure, opportunity, and rationalization/attitude. A large number of students will then rely on their skills in copy-pasting to save time and avoid complicated thinking (Bahadori & Hoseinpoufard, 2012).

A significant decrease in the level of plagiarism on the internet sources and student papers on the *Final Test* compared to the *Mid Test* is thought to influence awareness through questions *extenics*. Questions designed with techniques *extenics* and an appeal, to be honest in exams, can reduce the level of plagiarism. This opinion is supported by research results (Ferro & Martins, 2016) which state that educators can implement several strategies to help foster perceptions of right and wrong as far as plagiarism is concerned. Cronan et al. (2018) introduced a moral obligation and experience to analyze student behavior during plagiarism exams in an online learning environment. Simkin et al. (2010) used rational behavior theory to build a research model, used motivation, threats, class demonstrations to observe student cheating attitudes and subjective norms, and analyzed the relationship and intention of cheating behavior.

The decrease in plagiarism from internet sources and student papers is thought to influence the treatment given in designing the exam questions. The questions are given in the *Final Test* use techniques *extenics* by writing warnings and appeals not to cheat and have a positive impact on decreasing the level of plagiarism. After being confirmed with the students' answers, 77.27 % stated that the warning not to cheat stated in the exam sheet effectively increased academic integrity. *Theory Self Efficacy* (Leary, 2019), corroborates this finding which states that humans care about making good impressions on others; consequently, it can be assumed that a person asked for loyalty will behave loyally to make a good impression, so that a request for non-plagiarism in the test results in fewer people in the group committing plagiarism. Anderman & Koenka (2017) revealed that perceptions of personal and class goals, self-efficacy, and the consequences of cheating can effectively reflect students' intentional dishonesty. Research results Stogner et al. (2013) stated that the social learning variables of association, imitation, and social reinforcement with different expectations have a strong

predictive effect on intention and frequency of cheating behavior on the Internet. However, self-control and stress variables have a little predictive effect.

The level of plagiarism from the sources is publication relatively low, not different between the *Mid Test* and the *Final Test*. After being confirmed by the question of why not taking answers from the publications, 48.34 % of students stated that it was difficult to find suitable articles to support the answers and required hard efforts to get them. Judging from the current trend of higher education development, online learning as an independent learning mode without the supervision of educators will be more widely used in teaching reform (Chang et al., 2020). Meanwhile, plagiarism sources from the internet source and student papers can be accessed easily and in a very large number, thus encouraging students to copy and paste into answers without referring to references. The research results by Hosny & Shameen (2014) support this finding that 72 % of master students have often or sometimes use electronic resources as a source of plagiarism. This kind of result is claimed by students as the result of their work and ideas. Students are reluctant to admit that they are cheating and often underestimate academic dishonesty (Peer, 2014)

The next finding is that there is a positive and significant correlation between the level of plagiarism and the similarity index, internet source, and student paper with the results of the exam mid-semester. These results indicate that part of the exam results is *mid-semester* determined independently by the similarity index, internet source, and student paper, except for the source of plagiarism publication. This means that the higher the level of plagiarism, the higher the achievement of student learning outcomes on mid-semester exams.

Therefore, the research results by Olivia-Dumitrina et al. (2019) revealed that 39.2 % of students believe that they can take information directly from the Internet to do their academic assignments without risk. García-Villegas et al. (2016) confirmed that academic dishonesty is a manifestation of a culture where it is easy and common to break the rules and where integrity is not respected. This is of course worrying because competency acquisition is precisely determined in part by the level of plagiarism. According to Ferro & Martins (2016), the worst consequence for plagiarists is that they hinder their future chances of being successful in life.

In this research, it was also revealed that there was no correlation between similarity index, internet source, publication, and the results of the *Final Test*. Meanwhile, the level of plagiarism on the source of student papers has a positive and significant correlation with the results of the *Final Test*. The insignificant correlation of the three sources of plagiarism confirms that he also designed essays in exams in addition to the alleged influence of awareness. How to reduce the incidence of cheating during the exam, can use non-multiple choice exams and use a different version of the exam (Kerkvliet & Sigmund, 1999). The policy against cheating and the relevant penalties must be explained in the introduction of each lesson or exam and taken seriously by all educators (Hosny & Shameem, 2014). Meanwhile, the correlation between the source of plagiarism of student papers and the results of the *Final Test* is positive and significant

shows that students are still plagiarizing from internet sources, especially student papers, even though the question sheets have written a warning not to cheat.

According to Hosny & Shameem (2014), one of the reasons may be that electronic communication via handheld devices and other popular devices makes it easier for students to copy and send information both inside and outside the classroom. However, not all researchers agree that computerized note taking and assessment are. Some researchers argue that assessment and note-taking fluency, the rate at which students can record notes or answer examination questions, is more important than whether or not students write by hand or on a computer (Barrett, Swan, Mamikonian, Ghajoyan, Kramarova, & Youmans, 2014)

CONCLUSIONS

Based on the results of the research and discussion above, it can be stated that academic fraud in the form of plagiarism still occurs in the educational environment of the Doctoral program. The level of plagiarism that occurs in mid-semester exams is classified as mid-level positively and significantly correlated with mid-semester exams, except for sources of plagiarism Publications. Whereas for the source of plagiarism, student papers on the exams have *Final Test* a semester positive correlation with the results of the final semester examinations.

Furthermore, it is also proven that there is a decrease in the level of plagiarism from the mid-semester exams compared to the final semester exams. It can be concluded that plagiarism has penetrated all levels of education, starting from undergraduate and doctorate degrees. The ways that can be done, especially for examinations that take place online, are to provide an appeal warning and design questions that allow less space for academic cheating in the form of plagiarism. Applying and making them aware of academic violations is a moral and ethical violation that needs to be warned since the learning process. Techniques for designing exam questions that can reduce academic cheating, especially plagiarism from internet sources, need to be developed continuously in subsequent research. Results do not contaminate the test results copy-paste from other internet sources of printed materials, so that is the real competence obtained by students, so that when they have graduated, they are faced with problems in the world of work, they can overcome them according to the competencies they have obtained through a good learning process and exams. Which is done without cheating by promoting honesty, morals, and ethics.

Moreover, the results of this study lead to important future research on the factors associated with fraudulent behavior in learning and training; do not base assignments on digital resources and resources, but rather use non-digital resources available at university libraries and demonstrate an interest in and familiarity with the institution's academic regulations regarding plagiarism and other potential forms of academic dishonesty.

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