PLAGIARISM AND OTHER ACADEMIC DISHONESTY IN THE LIGHT OF FLORIDI'S INFORMATION ETHICS

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Abstract. *The aim of the paper is to raise awareness of the globally widespread issues, whose growth resulted in critical concern in regard to academic integrity and ethics, particularly in the age of the third industrial revolution. The purpose of this paper is to suggest possible solutions towards reducing plagiarism and other academic dishonesties in the light of Floridi's information ethics. To this end, experimental research method is employed to simulate key dimensions recognized as fundamental causes of the phenomena. The results show that moral agent negatively affects the whole infosphere and increases the level of entropy. Significant percent of plagiarism further correlates with the first and the most important moral principle given by Floridi. To satisfy other three principles, agent should take into account both, proactive and reactive strategies. The best moral action is the one that succeeds in satisfying all four laws simultaneously. Based on the findings introduced in the paper, the study provides recommendations towards academic honesty behaviour. The paper can contribute to both, academic institutions and business organizations.*

Keywords: *academic integrity, ethics, plagiarism, academic dishonesty, Floridi's information ethics*

1. INTRODUCTION

Academic dishonesty continues to attract considerable interest among academics nowadays, resulting in a globally widespread issue that create a thoughtful concern in respect of academic integrity and ethics [1, 2]. Ellahi et al. [2] in their recent research stand out that academic dishonesty have been under diligence for more than 70 years, yet with the third industrial revolution new forms of academic dishonesty have been emerged, which resulted in creating even greater challenge to deal with this phenomenon [2]. Academic dishonesty may be viewed from different perspectives [3], and is considered as the problem that contains various patterns including plagiarism, cheating, falsification, inappropriate collaboration and other dishonesties [4]. Among all, plagiarism is the most critical form that disregards academic integrity [1] and represents the problem that grows at high speed [5].

With that in mind, the paper seeks to find and suggest possible preventive solutions towards reducing plagiarism and other academic dishonesties, with the special reference to Floridi's information ethics. Taking into account that unethical behaviour during studying may further result in organizational unethical behaviour [6], the study contributes to both academic institutions and business organizations in its intention to resolve this complex issue.

The paper is structured as follows. The literature review section provides fundamental issues with respect to the ethics phenomenon: its definition, classification and overview of the historical development, starting from Socrates and Platon to Aristotel, who is justly recognized as the founder of ethics. Also, this section unfolds ideas of other significant philosophers that dealt with this subject, yet given in an abbreviated form. Further, it exhibit background on information ethics with the particular emphasize on Floridi's information ethics' principles. The research method is then introduced with a detailed explanation of the procedure carried out in the course of verifying the hypotheses given in the paper. Thereafter, research results are shown, followed by discussion and concluding remarks sections.

2. LITERATURE REVIEW

2.1. Ethics: definition, classification and historical development

Ethic represents a system of moral principles that is closely related with general dilemmas of decisions people make and life they lead [7]. Ethics studies can be divided into three branches [8]:

1. Metaethics deals with the meaning and origin of ethical principles. It is further divided into i) *metaphysical* aspect, which answers on the question whether ethical principles exist independently of humanity, ii) *psychological* aspect, which examines what motivates us to ethical behaviour and iii) *linguistic* aspect that seeks key ethical terms.
2. Normative ethics attempts to define principle which can distinguish morally right from morally wrong behaviour. The "Golden Rule" [9] outlines right from wrong, and three main branches can be observed: i) *theories of virtue* that emphasize personal traits instead of a set of predefined rules, presuming that person with virtue will behave morally; ii) *deonthological theories (theories of duty),* presuming that persons should behave according to some objective duties we have (e.g. to ourselves, to others, to God) which should not be neglected if some gain can be obtained from neglecting such duty; iii) *teleological theories*, stating that morality of the action can be decided by its consequences, stating action as moral if it ends in more good than bad to the subject of the action (ethical egoism), more good than bad to everyone except the subject of the action (ethical altruism) and more good than bad to all (utilitarism).
3. Applied ethics focuses on practical questions like pro-life or pro-choice views, genetic manipulation, ecological

ethics, artificial insemination, sexual morality or cyberspace ethics.

Historically, development of ethics for Western world began with the Sophists, followed by Socrates and his concept so called "eudaemonia", which may be perceived as philosophy that defines “luck” or actions towards well-being and prosperity. In other words, Socrates understands “luck” as the simultaneous desire that a person behaves in accordance with the right norms, resulting in an successful outcome and welfare. The moral doctrines of Socrates provide direction towards further development of Hellenic and Hellenistic philosophy of moral.

Further, Plato, Socrate’s disciple continues work by considering the concept of Good (with capital G), observing it in two ways, i.e. as final objective and as a universal principle. He considers the universality of good, dealing with the metaphysics, and recognizes the moral intuition. Also, Plato examines innateness of human kindness as well as the role of the mind in assessment of morality acts. Plato discusses relations between ethics and society, and relations between ethics and aesthetics. He distinguishes difference between virtue and its end/consequence, making category of independent, metaphysical virtue and good.

Aristotel deals with the fundamental issue of good principle that leads to “eudaemonia”, meaning perfect fulfilment of humans’ nature, which can be linked to Maslow’s self-actualization [10]. Aristotel looks into ethical principles moving between virtue and ultimate goal of the action. To acknowledge the establishment of virtues, it is necessary to review the theory that is based on the philosophy which takes into account virtue as a measure “mesotęs” [11] between excess and deficiency. The theory became the leading one in explaining the virtues in Christian period. It has been argued that virtue is dependent of mind and cannot be viewed separately. Aristotel has analysed eleven virtues and finally concluded that extreme values of virtues imply flaws [12, 13]. Thus, a lack of courage leads to cowardice; while too much courage represents precipitance and violent recklessness. Subsequent contribution to this phenomenon has been given by Christian theologians, adding three basic Christian virtues: faith, hope and love.

Thomas Aquinas follows Aristotle’s idea of good and evil as part of our psyche he called “practical wisdom” (*prudentia*) [14, 15]. Tomas Aquinas believed that there is an analogous fraction in human psyche, so called "synderesis", which provides an intuitive orientation in moral principles. According to Aquinas, “synderesis” was created by God when he created humans as rational beings, to be able to realize the spiritual world of moral truth. The subsequent examination has focused on human selfishness.

Thomas Hobbes [16] (seventeenth century) argued that the majority of human actions are based on selfishness, including positive intention to produce good deed, in order to get the feel of superior value, to acquire social recognition, or to use it in some other way. This viewpoint is called the psychological egoism. Also, it has been recognized that egoism is the basis for all actions towards superiority. Closely to this view is the aspect of psychological hedonism as well as psychological altruism, representing a set of believes that there is still some instinctive goodness as the main motor for actions, in addition to egoism and hedonism.

John Locke is loosely related to such ideas, creating philosophy of inalienable human rights and ethics around it [17], making moral foundation for Declaration of Independence and rights theories in ethics [18], based on four principles:

- Rights are the result of the natural order of things
- Rights are universal and cannot vary from country to country
- Rights are the same for all people regardless of gender, ethnicity and capabilities
- Rights are inalienable, meaning that it is not possible to renounce them voluntarily.

Theory of Immanuel Kant [19] tends to theories such as "Golden Rule", and at the same time is similar to other deontological theories. Kant's work largely relies on work of Grotius and Pufendorf. He recognizes that we have a moral obligation to both, ourselves and others, yet he considers that there is a fundamental principle of duty, from which all other duties are derived. This principle is called as categorical imperative that is based on four basic dimensions.

Centuries of development lead to new branch in the research. Advent of cyberspace imposed questions concerning ethics in that environment, and information ethic distinguished as main stream for research. It is seen as a generalization of environmental ethics by Dodig Crnkovic [20], who finds three main traits:

- Less anthropocentric concept of agent, including non-human (artificial) and distributed (networked) entities
- Less biologically biased concept of patient as a ‘centre of ethical worth’ in any form of existence.
- More inclusive conception of environment that encompasses both natural and artificial eco-systems.

2.2. Information ethics overview

Today, the theory of information ethics is more than twenty-three hundred years old. It has its roots in Aristotel’s theory of understanding human nature and individual objects within it. In the 1940s and 1950s, philosopher and scientist Norbert Wiener grounded a base for today’s informational understanding of the Universe and the role of humans, focusing on ‘cybernetic’ analysis of human nature and society, and perceiving human beings as information objects.

Based on his findings in the area of cybernatics, communication theory, and computing science Wiener created assumptions related to the information age [21]:

- The whole Universe including its objects and processes is made of matter/energy and information.
- All animals are information-processing beings which behavior depends centrally upon such processing ability
- In contrast to animals, humans have bodies that make the information processing ability in their central nervous systems especially sophisticated.

Following these assumptions, Wiener claimed that information is physical – it is exposed to laws of nature and can be measured in the light of science. By combining the knowledge from the domains of philosophy, physics, biology and information science, Wiener created philosophical foundations for the ethical field that is currently called information and computer ethics.

Wiener's considerations of Information were to a great extent linked to a concept, often referred to *Shannon Information*. In 1948, Wiener's student Claude Shannon published an article titled "*A Mathematical Theory of Communication"*, which provided foundations for the theory of Information. He was often called a father of the Digital Age. Although almost all of the credits go to him, the development of Information Theory was the result of joint contributions made by many outstanding individuals, who later broadened his concepts and ideas [22].

In his paper *"The Mathematical Theory of Communication"*, Shannon presented elements and steps of communication, considering information as a message or a set of messages that have to be sent via noisy channel from the information source to the information receiver. Before being transferred over the channel, the sender's messages is converted into signals. A receiver receives the signal, reconstructs it in the form of a message that was intended to be delivered. Finally, the message is delivered to a person or for whom it was originally created. Shannon also brought entropy – a key measure of information into the theory. Entropy reflects the amount of uncertainty that is involved in the value of a random variable [23].

By linking matter-energy concept and Shannon information phenomena, Wiener showed that every physical process emerges as a combination of matter and information and neither can exist without the other. In the period during the Second World War, together with several colleagues, Wiener made substantial achievements to cybernetics as an applied science. According to Wiener, this new science focused on computers and the enormous social and ethical implications of their use [24]. Soon after the end of the Second World War, he further investigated the matter of social and ethical issues of upcoming automatic age, what we nowadays refer to the second industrial revolution.

After Wiener's attempts to raise consciousness about ethical questions, there was no significant theoretical contribution to this field for more than a decade. The discussions related to the question of information ethics continued between the 1960s and 1970s by scientists who did not realize that Wiener had already done so much work in this area. Setting aside the contributions made by Wiener, the concept of "computer ethics" has been firstly introduced by Walter Maner. Maner, as well as Johnes considers this area of research as one that deals with issues that were caused by the progress of computer technology [25]. According to these authors, already existing ethical problems become even deeper. In her book, Johnson described similar issues to those discussed by Maner and she also referred to the application of the concept of utilitarianism and Kantaism to tackle moral problems and issues [26].

The most influential definition of computer ethics in this area was given by James Moor in his article *"What Is Computer Ethics?"* The specificity of this theory is reflected in the fact that it is independent of any philosophy theories and adaptable for different approaches for solving ethical problems. Moor claimed that computers are universal tools, and that they can perform any operation that includes input, output, and logical operators. He stressed that there will be two stages of information revolution. The first phase is *technological introduction* that includes development and refinement of computers. In the second phase of *technological permeation*, we noticed broad dispersion of technology in everyday human activities and social institutions [27].

Each of these definitions of computer ethics suggested that influence of computers and computer technologies not only boosted old problems, but also raised some new ethical problems that required new theoretical and practical approaches for grounding new ethical rules and policies. The use of information technology affected in invaluable measure the ethical dimensions of the information society. The combination of computer technology and the power of information finally produced Information ethics as a scientific discipline [27].

Information ethics opens some new possibilities, like reformulating Golden rule towards less anthropocentric form:

"Always behave in such manner to treat information, whether it resides in yourself or in other entity not as a mean to the end, but as the end itself".

That form puts greater challenge task in front of the agent of the ethical behaviour, and is impractical due to cyberspace which often distances agent of the action and consequence of its actions, puts actions into wide, complex system of interaction, introduces new entities like artificial intelligence agents etc. Other similar experiments in reformulation of classical principles in form appropriate for information entities did not result in significant advancement. One of the most successful approaches is Luciano Floridi's approach, which stars from the "infosphere" [28], our new environment comprised of all info-products, info-targets and info-resources, structures and processes providing information.

That environment is especially strengthened in last few decades due to the advent of information and communication technologies [29].

2.3. Luciano Floridi's principles of information ethics

Although the discussion related to the philosophy of information lasted from the end of World War II, Luciano Floridi is considered to be first or at least the most important, philosopher of the information ethic. Floridi argues that information can be considered in three ways that determine approach to information ethics. His approach turns out to be useful, as it enables recognizing the ethical relevance of information. Information can have crucial role as a resource that implies that individuals possess information. In the sense of information as resource, ethics can be described "*using the triple A*" availability, accessibility and accuracy of informational resources. Information becomes a product when it is reviewed, managed and used by agents - individuals or companies. During such a process information can have ethical impact, which implies the necessity for the ethical analysis. In the context of information as a product, information ethics is described using the terms such as accountability, liability, libel legislation, testimony, plagiarism, advertising, propaganda, and misinformation.

Since environment is made of information, third sense in which information can be subjected is information as target. A good example of this consideration of information is hacking, vandalism or security, piracy, intellectual property, open source, freedom of expression, censorship, filtering and contents control [31].

In Floridi's theory there are three fundamental concepts upon which the theory holds its ground: infosphere, moral agent and patient, ontology [32].

Driven by ICT revolution, which is impossible to deny, Floridi tends to carry out a general theory of the world based on the philosophy of information. He suggests that, one of the most important consequences of technological change is alighting the human from a pedestal among others, animate and inanimate, which have in common that - each in its own way - process information together and inhabit infosphere. It is a world of inforg, where only semantic inforg is human. In other words infosphere is sum of all informational entities and their relations [32].

Moral agent is an individual or an artificial creation, due to the fact that artificial structures can undoubtedly make information misusage. Floridi distinguishes those who take a moral act (agents) and those who suffer (enjoy) the effects of the act (the patients). Characteristics of the agent are interactivity, adaptability and autonomy [33].

Since information is observed as an entity, in considering information ethics, we must use the ontological approach, which means that any form of reality, have a right and possibility to exist and emerge in its own way in the nature [32]. Information Ethics is an ontocentric, patient-oriented, ecological macroethics [32].

Biocentric ethics is analysis of moral principle of ecosystem on the on the *intrinsic worthiness of life and the intrinsically negative value of suffering* [32]. The idea of this approach is to develop ethics in which patient can be human or any form of life, which well being has moral standing. Moreover, ethics principles must contribute to guiding the agents ethical decisions and behavior.

According to Floridi, current understanding of the information ethics in the sense of biocentrism must be replaced with the ontocentrism, suggesting that there is something more elemental than life, which he calls being, and something more fundamental than suffering, known as entropy [34]. In his consideration of the information, entropy addresses any means of destruction of informational objects. In creating ontological theory, the method of abstraction plays a critical role. *"Level of Abstraction (LoA)"* specifies that, for example, every object can be viewed differently by few people, which depend on their own interests and conceptual interfaces. Floridi defines LaA in the following way [36, p. 249]:

"A LoA can now be defined as a finite but non-empty set of observables, which are expected to be the building blocks in a theory characterized by their very choice".

Following the elements of Information macroethics, it can be concluded that this theory is universal since it suggests that every being must be respected and have equal rights in the infosphere. From the biocentric perspective only alive entities are considered to be the center of moral claims. According to Floridi and his ontocentric theory, every form of being is also a body of information, thus information ethics is focused on it, and helps to overcome the limits grounded in the biological approach [35].

Floridi's belief is that every individual has obligations to be morally concerned not only with their own development but also with the well-being of the whole infosphere. Responsibilities of human moral agent to the infosphere are guided by four moral principles given by Floridi [30]:

1. Information entropy ought not to be caused in the infosphere (this is basic, most general principle Floridi identifies as the null principle)
2. Information entropy ought to be prevented in the infosphere
3. Information entropy ought to be removed from the infosphere
4. Information ought to be promoted by extending, improving, enriching and opening the infosphere that is by ensuring information quantity, quality, variety, security, ownership, privacy, pluralism and access. (This principle is most detailed and specific).

These principles lead an agent to make the appropriate decisions and actions that will affect infosphere and every informational entity involved. Moral agent is accountable for any mistake that can occur and can increase entropy, which will make him misunderstood IE moral laws. Floridi argues that every human moral agent have special role that is more important than roles of other moral agents. His theory provided framework that allowed us to address issues which we were unable to handle with the methodological frameworks proposed earlier [30].

3. RESEARCH METHOD

For the purpose of this paper we have used experiment as the most suitable research method to understand cause-and-effect processes by showing what result occurs when particular factors are manipulated. Manipulated or independent variables in our experimental research represent four dimensions we have recognized as key factors that urges plagiarism and other academic dishonesty. On the other side, we have measured the dependent variable, which in our study represents the percent of plagiarism as an effect of the simulation process.

The dimensions in the role of manipulated variables were created based on the broader literature review and based on the students' experience. To ensure the objective view on conceptualized independent variables, we have run pilot research by employing interviews with professors from various universities. Finally, independent variables consist of the following key dimensions referring to key factors affecting plagiarism and other academic dishonesty:

- immorality;
- lack of focus;
- lack of knowledge;
- combined immorality and dishonesty.

Key dimensions were constructed in four different scenarios, each of which simulates a corresponding dimension.

Scenario 1 was developed to simulate immorality by editing text from published paper (copy/paste) without citing the source. Scenario 2 attempts to imitate lack of focus. It contains reorganized text from the same source used for scenario 1, but without citing the source. Scenario 3 was created to manipulate third dimension, i.e. lack of knowledge in which all possible mistakes in referencing were made. Finally, scenario 4 implies simulation of combined immorality and dishonesty. This scenario was simulated by incorporating other's published research results showing as original one.

Further, four scenarios were examined using two different plagiarism software in order to understand plagiarism effects of each factor and at the same time to verify the consistency of the obtained results from different sources. The results are depicted hereafter.

4. RESULTS AND DISSCUSSION

Table 1 shows results of experimental research using four different scenarios to verify percent of plagiarism employing two different software packages.

Table 1. The results of experimental research

Independent variable	Dependent variable – percent of plagiarism	
	Results from software 1	*Results from software 2*
Immorality	13%	11.90%
Lack of focus	8%	4.98%
Lack of knowledge	9%	5.02%
combined immorality and dishonesty	9%	5.02%

Based on the results depicted, simulation of immorality, i.e. plagiarism in documents [37] by editing copied published text without citing the source, has the highest percent of plagiarism (13%, 11.90%), followed by scenarios that relate to lack of knowledge and combined immorality and dishonesty (9%, 5.02%). However, manipulated variable with the lowest percent of plagiarism refers to lack of focus (8%, 4.98%).

In respect to Floridis principles, it is clear that in every scenario presented, decisions made by moral agent affect the well-being of the infosphere and hence the informational entities involved. The contribution of moral agent negatively affects the whole infosphere and increases the level of entropy. The results show that every scenario contains significant percent of plagiarism, which correlates to the first and the most important moral principle given by Floridi. Breaking rule number 0, the null law, represents the worst scenario an informational agent can do, implying highest blame. In order to satisfy other three principles, agent should take into account both, proactive and reactive strategies. The best moral action is the one that succeeds in satisfying all four laws simultaneously.

According to the obtained results, the study provides several findings and implications that should be noted. First, it is evident that the results of independent variables differ in respect to dependent variable, i.e. in regard to plagiarism effects using two different sources for plagiarism detection. Such result implies that there is no consistency when verifying the plagiarism percentage using different software packages. Second, the results depict that immorality amounts the highest percent of plagiarism, comparing to other independent variables. In that respect we have put a question whether plagiarized original text has harder form of academic dishonesty than plagiarizing original research results? Our dilemma further implies that plagiarism software packages do not recognize the weights of plagiarism effects, which further implies development of smart technologies and robots that will support such issue more effectively. Although many software applications were designed to detect or to decrease plagiarism in academic works [38], our finding corresponds to the statement that plagiarism software packages are still in emerging phase, implying developments and improvements in years to come [39]. McKeever [39] noted that there is no software which is created to differ academic honesty from academic dishonest behavior, leaving that judgment to subjective expertise of teachers / academics.

Further, it is evident that simulation of third scenario has a high percent of plagiarism, comparing to other manipulated variables, indicating that lack of knowledge and clarity of citing also contribute to academic dishonesty. It has been argued that some students do not know what plagiarism is [40]. Also, it has been found that if they are aware, there is no enough understanding at what point the usage of different sources passes into academic dishonesty [41, 42]. Roig and DeTommaso [43] found that students often do not make difference between plagiarized text and correctly paraphrasing. Similarly, Ting [44] in his recent research revealed that the main reason for students to skip citations in their assignments lie in the lack of knowledge on referencing conventions. This finding further implies development of strategic and tactical educational measures that will help students to understand cause-and-effects of this significant issue. Also, we are with the opinion that fundamentals principles should be made in respect to arising awareness of the plagiarism issue, by providing adequate education of how to properly use knowledge to reduce errors and at the same time to increase academic honest behaviour.

Finally, rapid growth of information that do not create value for stakeholders often result in difficulties to properly cite all sources, which may result in academic dishonesty without having real awareness of such outcome. Accordingly, we suggest a systematic review of existing approaches, principles, methodologies and tools that will prevent negative impact caused by the phenomenon of big data.

5. CONCLUSION

Overall, we have some conclusion on morality of academic plagiarism. Also, we can also analyse academic publishing environment and common practice in the light of ethical theories and Floridi's information ethic.

Common practice of journals in academic publishing, especially those with high standings is to take over most author rights. So in a way, leading academic journals are using other people's work for promotion of their status.

Large number of journals offers their articles free of charge, in some form of Open Access. However, common practice among best publishing houses is to charge significant sums for downloading of the articles. Again, common practice is that not even a part of amount charged goes to:

- Article authors
- Article reviewers

Those parties invest most of the work related to the article production and dissemination, and journal holds better negotiation position because authors are often required to publish their ideas and articles, donating their work for free. The donation is in this case not "Pro bono civitatis", taking into account larger community does not directly benefits – they have to pay in order to read the findings, but mostly for the good of the journal owners controlling cash flows of the journal business.

So a question can be asked: Whether such practice "extends, improve, enrich and open the infosphere" (Floridi's fourth law)? Whether leading journals management behave in a way that their behaviour should become a universal maxim, following ideas of Kant? Such behaviour maxim can be, maybe severely, formulated as "If you are in position to use non-proportionally large share other people's work for gain of smaller part of community which was not directly involved in the creation of the value, use your position and obtain as much gain as possible without compensating directly creators of value".

Also, we can ask a question if paradigms of academic publishing in late XX and early XXI century is in accordance with information ethics and ethics, and then in regard to plagiarism is it a cause of problem, or symptom and manifestation of deeper problem?

In regard to business world, employees with the highest moral values over the time become victims under the pressure to behave unethically, if organizational culture supports such behaviour. Accordingly, plagiarism should not be cured post-festum, but preventively, through adopting main institutional paradigms of academic publishing to principles of ethical theories, maybe at first with Floridi's information ethics.

The phenomenon should be viewed holistically to understand all aspects that disturb academic honesty. To this end, the study provides a set of recommendations that should be taken into account for further development of academic honest behaviour: a) development of sophisticated technologies and robots that will be able to differentiate academic honesty from academic dishonest behaviour; b) development of strategic and tactical measures that will help students to understand cause-and-effects of academic dishonesty; c) development of fundamentals in regard to arising awareness of the plagiarism issue, by providing adequate education of how to properly use knowledge to reduce errors and at the same time to increase academic honest behaviour; d) a systematic review of existing approaches, principles, methodologies and tools that will prevent negative impact of big data that might cause academic dishonesty.

Future research should incorporate qualitative studies to create potential to obtain deep factors that influence academic dishonesty. Also, future research should involve perspectives of different stakeholders in order to further contribute to academic integrity, ethics and to academic society in the struggles with this globally widespread issue.

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