

General Guidelines for Academic Integrity

Report (amended version)

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Erasmus+ project “European Network for Academic Integrity”

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ABOUT THE PROJECT

The project “European Network for Academic Integrity” (ENAI) aims foremost to raise awareness in the matters of plagiarism, academic ethics, scholarly values and academic integrity. ENAI focuses not only on students, but on the entire academic community (including professors, researchers, post-docs, PhDs, administration staff and management, academic ethics committees, etc.).

This project envisages developing three major outputs: Educational materials for higher education institutions’ teachers and students (O1), Toolkit for cross-sector cooperation in terms of academic integrity (O2) and Handbook for improvements in academic integrity (O3). The latter output consists of seven sub-outputs, such as general guidelines for academic integrity, glossary of terms related to academic integrity, self-evaluation tools for students, teaching and research, self-assessment tool for institutions / faculties / departments and briefs.

This report refers to a sub-output 3A (General guidelines for academic integrity) of the project.

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Preface

These general guidelines serve as a supportive document for the glossary for academic integrity (sub-output 3G) that describes the definitions of terms related to academic integrity. They serve to help build common understandings of integrity issues in both academia and business. The guidelines outline minimum requirements and responsibilities of various stakeholders in academia. Many of the guidelines are necessarily general, but, where relevant, we provide country-specific examples as well as adjusting to meet to the needs of different fields of study/research.

The general guidelines are addressed to a full range of stakeholders, including national ombudspersons, judicial authorities, compliance officers, research project managers and other related bodies or units in academia (such as policy units, educators/instructors, senior administrator/managers/coordinators) as well as students, the business sector and others.

Guidelines development approach

The development of the guidelines was divided into four stages.

First, each guideline development group (GDG) member selected terms from the Glossary for Academic Integrity for which they have expert knowledge. At the end, 46 out of 208 terms remained free of guidelines as self-explanatory.

Second, GDGs agreed on criteria for general guidelines development, such as: 1) a guideline should be country-and discipline-specific where appropriate; 2) a guideline should be concise; 3) a guideline should help avoiding misinterpretation of the words used in a term's definition; 4) a guideline should help make a distinction between terms; 5) if a guideline is inherent to particular stakeholders, it should be clearly stated; 6) only reliable sources should be included in guidelines; sources should be properly acknowledged, i.e. in-text citation and the list of cited sources; and 7) a guideline might provide short and clear examples/illustrations.

Third, each GDG member made his/her contribution either individually or within a smaller group of those members who selected the same term for guidelines development.

Fourth, all contributions were refined in relation to the definition of a term provided in the glossary for academic integrity (see <http://www.academicintegrity.eu/wp/glossary/>) and to the set of predefined criteria in order to ensure consistency of a guideline. Each guideline contains an excerpt from the glossary for academic integrity, i.e. only definitions of related terms are used in the box while the source could be consulted within the glossary for academic integrity. Each guideline is formatted with a few sub-headings, such as additional clarification on glossary definition(s) (backed by reliable

sources), related examples or requirements (where possible backed by reliable sources), recommended reading and references.

In summary, this amended report addresses general guidelines for 112 terms related to academic integrity that are further grouped thematically into i) guidelines about fundamental terms, ii) guidelines about institutional culture and practices, iii) guidelines about science and research, iv) guidelines about academic writing and publishing, and v) guidelines about academic integrity breaches.

Limitations

Although all web-based links were valid at the time of completion in February-October 2018 (and amended version in September 2019), over time some links may have expired and others may only be available once cookies are accepted.

Even though the GDG members come from various countries and disciplines, development of particular guidelines was done in smaller groups. This might have led to examples that are discipline-specific or country-specific. We believe this does not threaten usability of the guidelines in other contexts, but it has to be taken in account. The authors will be grateful for any additional suggestions for improvement.

Amendment notice

The first version of this report has been available since October 2018. However, in the course of subsequent project work the authors have noticed content related and technical errors which have been adjusted in this amended version of the report. Also, some pieces of text have been made more consistent or clarified. A full list of mended guidelines is provided in Errata available on the web site: <http://www.academicintegrity.eu>¹.

¹ Direct link to Errata: http://www.academicintegrity.eu/wp/wp-content/uploads/2019/09/Errata_Guidelines_09_2019.pdf

Guidelines about Fundamental Terms

Ethics is a branch of philosophy that derives from ancient greek *ἠθικός* (ethikos), from *ἦθος* (ethos), and includes the study of universal values and human morality. Ethics includes the subjects of moral psychology, descriptive ethics, and value theory (Audi, 1999).

Basic **ethical principles** include (a) fidelity (being faithful) (b) beneficence (benefiting others) (c) non-maleficence (taking positive steps to prevent harm or minimise the risk of harm in cases where harm cannot be avoided); in other words, the actions must produce more good than harm, (d) justice (being just; not imposing any unfair burdens), and (e) respecting autonomy and integrity which necessitates the obligation to respect the decisions made by the participants (and collaborators) with honesty (Hobbs, 1948).

Some dictionaries define the term “ethics” in relation to morality that loosely describes common values of ethics of traditions, groups or individuals (Audi, 1999). Since an ethical code has become a fundamental pillar in every discipline, the World Health Organization (WHO, 2017) has itself identified the following as their core values of ethical principles:

- **Integrity:** To behave in accordance with ethical principles, and act in good faith, intellectual honesty and fairness;
- **Accountability:** to take responsibility for one’s actions, decisions and their consequences;
- **Independence and impartiality:** to conduct oneself in a manner that personal views and convictions do not compromise ethical principles, official duties or other interests;
- **Respect:** to respect the dignity, worth, equality, diversity and privacy of all persons;
- **Professional Commitment:** to demonstrate a high level of professionalism and loyalty to the organization, its mandate and objectives.

Ethical standards are often created at the professional, institutional and/or organisational level. For example, maintaining gender equality in the workplace; treating the customer with respect and kindness; or anonymity of a customer's private information. In academic research, this means following the main ethical principles such as fidelity, beneficence, non-maleficence, justice, autonomy and integrity (see above). In fact, there is no uniform set of “standards” for different fields and the enforceability may vary.

Note that ethical standards in the workplace may mean the application of moral principles, standards of behaviour, or a set of values regarding appropriate conduct in the workplace setting, either as individuals or in a group. These include, maintaining moral norms such as: being honest and trustworthy, being courteous and respectful,

being competent, having the desire for continuous improvement, maintaining ethical/moral behaviour, respecting confidentiality, exemplary behaviour and so on. However, it should be noted, the meanings of the terms “morals” and “ethics” may sometimes be contradictory (Laccarino, 2001).

Ethical values (or principles) should underpin ethical standards. In any field, these principles provide a framework for professional behaviour to maintain the ethical standards for an institution’s strategies, and actions to achieve its goals. Sometimes morals conflict with ethical values. For example, defence lawyers’ morals may tell them a murderer should be punished, but their professional ethical value requires them to defend their clients. Likewise, in medicine when giving professional advice on DNR (Do Not Resuscitate), the physician’s own moral values should not interfere with measures taken for informed consent.

Ethicality is a synonym of “being ethical” and is usually referred to as the ethicality of particular behaviour. Ethicality is just following ethical principles with moral judgement, which can be affected by human thinking, behaviour and experience, since humans are prone to systematic and predictable ethical errors.

Ethical dilemmas are common in medicine (Parker et al., 1997) in situations when the professional is faced with a decision-making problem, with a choice between different possible moral priorities, without specific indications or information about which of them is clearly acceptable or preferable. In computer science, the dilemmas include discussions of hacking and computer crime, the theft of hardware, software or data, sabotage in forms of viruses, worms or trojans, denial of services, violation of privacy of companies, their customers and employees, violation of privacy of natural persons and their personal data, usage of expert systems instead of natural persons (e.g. in medicine, robotics), replacement of humans with intelligent machines (e.g. in factories, self-driving cars), expert systems, liability for faulty programs, and software ownership and piracy in terms of privacy (Berzai, 2017).

ENAI recommendation

In order to practice ethical behaviour, institutions should focus on creating their own ethical code based on acknowledged ethical principles (perhaps following the WHO guidelines). In addition, institutions should focus on establishing independent committees to oversee ethical conduct, both inside and outside the organisation (including partners and collaborators). The ethical committee membership may include one or two employees of the institution; however, the majority of the members should be neutral and be able to function independently without facing any pressures from the institution. These committees should be responsible for drawing up ethical principles for the institution. In state institutions such as the UK's National Health Service (NHS), or its counterparts in other countries, there is usually a centralised committee to ensure consistency in the oversight of ethical practices.

Examples of available guidelines

Declaration of Helsinki - Ethical Principles for Medical Research Involving Human Subjects. Adopted by the 18th WMA General Assembly, Helsinki, Finland, June 1964 and one of the latest amended by the 64th WMA General Assembly, Fortaleza, Brazil, October 2013.

Ethics for Researchers: Facilitating Research Excellence in FP7. Brussels: European Commission, 2013. Available at: http://ec.europa.eu/research/participants/data/ref/fp7/89888/ethics-for-researchers_en.pdf [11 March 2018]

McCormick, R.M. (2013). Principles of Bioethics. Ethics in Medicine, University of Washington School of Medicine. Available at: <https://depts.washington.edu/bioethx/tools/princpl.html> [11 March 2018]

Universal or Core Ethical Values. Available at: <https://static1.squarespace.com/static/557227cee4b0c5ac0270c331/t/5890fb0db8a79b243d8e6ab3/1485896462108/UniversalOrCoreEthicalValues.pdf> [11 March 2018]

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Berzai, L. (2017). Ethical problems in computing. Association of Information Technology Professionals. Available at <https://www.aitp.org/home/aitp-blog/2017/07/04/ethical-problems-in-computing/> [31 May 2018]

Hobbs, N. (1948). The development of a code of ethical standards for psychology. *American Psychologist*, 3(3): 80-84.

Laccarino, M. (2001). Science and ethics. *EMBO Rep.*, 2(9): 747-750. DOI: 10.1093/embo-reports/kve191

Parker, M.H., Price, D.A. Harris, P.G. (1997). Teaching of medical ethics: implications for an integrated curriculum. *Medical Education*, 31(3): 181-187. <https://doi.org/10.1111/j.1365-2923.1997.tb02563.x>

WHO (2017). *Code of Ethics and Professional Conduct*. Available at: http://www.who.int/about/ethics/code_of_ethics_full_version.pdf?ua=1 [11 March 2018]

RESPONSIBILITY | ACCOUNTABILITY | AUTONOMY

The term "**accountability**" derives from Latin *accomptare* (to account) and is the prefixed form of *computare* (to calculate) (Oxford English Dictionary, 1989) and is used widely in all professions, including academic communities. It is worth mentioning that this term is frequently aligned with responsibility. Although both terms are similar in character, they should be differentiated. Being accountable does not necessarily imply being responsible. For example, the business sector demonstrates its accountability towards stakeholders through publishing their corporate social responsibility (CSR) report online, but this does not exempt them from their responsibility if there are mistakes.

Accountability is often discussed in line with **autonomy** of higher education institutions and quality of higher education. Autonomy (Christman, 2018) comes from Ancient Greek: *autonomia* (αὐτονομία) and *autonomos* (αὐτόνομος) from - *auto* (αὐτο) "self" and *nomos* (νόμος), "law". The concept of autonomy "one who gives oneself one's own law" is the capacity to make an informed, un-coerced decision (Stanford Encyclopedia of Philosophy).

For example, in a Lithuanian Constitutional Court decision (28/07-29/07) it is clearly stated that being autonomous is about accountability and responsibility towards society in general – *"autonomy is relative and must be coordinated with the principle of responsibility and accountability to the state and society, and with the duty of schools of higher education to observe the Constitution and laws"* (Ruling, 2008, point 2.1).

There are diverse **responsibilities** inherent to various stakeholders in academia (e.g. responsibilities to research participants; editorial responsibility; social responsibility). The main responsibilities of an academic community are often described in the code of conduct/ethics.

The duty of care towards research participants should be carried out in accordance with internationally accepted ethical principles and embedded in codes of conduct/ethics. To appropriately address these responsibilities, organisations conducting research should carry out a research ethics assessment beforehand. Moreover, each scientist is equally responsible for both his/her own and others' academic development and assessment when having a group work (Vujakovic and Bullard, 2001).

Social responsibility in research and higher education refers to decisions that take into account the potential impact on society at large and the environment. For example, social responsibility is seen through the dissemination of research results/findings, participation in relevant societal debates and other activities.

Examples of social responsibility

Dissemination of research to the general public. In: *Guidelines for Research Ethics in Science and Technology*. The Norwegian National Research Ethics Committees, 2016. Available at:

https://www.etikkom.no/globalassets/documents/english-publications/60126_fek_guidelines_nent_digital.pdf [26 February 2018]

Minimal requirements and responsibilities related to accountability in higher education

Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG 2015). Available at: http://www.enqa.eu/wp-content/uploads/2015/11/ESG_2015.pdf [26 February 2018]

Rome Declaration on Responsible Research and Innovation in Europe. Participants and organisers of the conference "Science, Innovation and Society: achieving Responsible Research and Innovation", Rome, Italy, 19-21 November 2014. Available at: <https://ec.europa.eu/digital-single-market/en/news/rome-declaration-responsible-research-and-innovation-europe> [9 August 2018]

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Oxford English Dictionary. Oxford University Press, 2nd edition, 1989.

Ruling of the Constitutional Court of the Republic of Lithuania regarding on the compliance of paragraph 4 (wording of 22 April 2003), paragraph 5 (wording of 30 June 2005) of article 47 (wording of 18 July 2006), article 57 (wording of 18 July 2006), paragraph 3 (wording of 22 April 2003), paragraph 4 (wording of 30 June 2005) of article 58 (wording of 30 June 2005), paragraph 1 (wording of 22 April 2003) of article 60, and paragraph 1 (wording of 22 April 2003) of article 61 of the Republic of Lithuania's Law on Higher Education with the Constitution of the Republic of Lithuania, as well as on the dismissing of the part of the case subsequent to the petition of the President of the Republic of Lithuania, the petitioner, which was set forth in his decree (No. 1K-1138) "on applying to the constitutional court of the Republic of Lithuania" of 22 October 2007, requesting an investigation into whether items 3 and 14 of the methods of establishing the needs of funds from the state budget of the Republic of Lithuania and assigning them to institutions of science and studies as approved by the resolution of the Government of the Republic of Lithuania (No. 1272) "On approving the methods of establishing the needs of funds from the state budget of the Republic of Lithuania and assigning them to institutions of science and studies" of 11 October 2004 (wording of 5 October 2006) are not in conflict with paragraph 3 of article 40 and paragraph 3 of article 41 of the Constitution of the Republic of Lithuania, 20 March 2008. Available at: <http://www.lrkt.lt/en/court-acts/search/170/ta1368/content> [14 February 2018]

Vujakovic, P., Bullard, J. (2001). The Ethics Minefield: issues of responsibility in learning and research. *Journal of Geography in Higher Education*, 25(2): 275-283.

MORAL | MORAL NORM | MORAL VALUES | MORALITY

The term “**moral**” (synonyms are virtuous, good, righteous, upright, upstanding, right-minded, etc.) (Merriam Webster’s Thesaurus, n.d.) is concerned with the principles of right and wrong behaviour, also known as morality.

A moral person may choose to follow some code of ethics. However, the term moral refers to intrinsic principles of a person or group (not general). According to Lawrence Kohlberg (1976) humans do not have an innate moral framework at birth. During childhood, the concept of “morals” begins by following behaviour accepted by society, mainly to avoid punishment. As they grow more self-aware, these self/socially imposed “principles” are internalised. However, it should be noted that these morals may or may not be in line with the law. In addition, one would not simply accept all the cultural norms as morals.

Since moral values are culturally linked, they may vary across countries, tribes and ethnicities. A morally accepted act for one group/ethnic community can be a prohibited act for others (e.g. polygamy).

Morality is often a culturally conditioned response. It may be influenced by parental upbringing, social interactions, community norms, friendships, or religious beliefs (Manstead, 2000). The term “**morality**” (from Latin: *moralis*, lit. 'manner, character, proper behaviour') seems to be used in two distinct broad senses: a descriptive sense and a normative sense. The former is associated with codes of conduct which are regarded as either individual or social cultural values; whereas the latter refers to a universal consensus on the acceptance of anything either as right or wrong without associating it with cultural norms (Gert and Gert, 2017).

A **moral norm** is the “*moral correctness of a behaviour*” and can help in the evaluation of what is right and good within a given situation (Harms and Skyrms, 2008). A moral norm is often taken as an indication how humans ought to exercise their freedom/private or public behaviour. These can be expressed as rules, principles, dispositions, and character traits. In other words, moral norms are standards or criteria for judging and acting. They play a significant role in sustainable behaviour. There are three different types of moral norms, namely, (a) material norms – specifying the means of actions by deciding what should (or should not) be the action (e.g. intentional cheating is wrong), (b) formal norms – deciding the mode (by whom) or form of action or non-action (e.g. the righteous man walks in his integrity), and (c) synthetic norms – a combination of the description of an action with moral evaluation (e.g. thou shalt not kill) (Harms and Skyrms, 2008).

Moral norms are the criteria of judgement about the sorts of persons that we ought to be and the sorts of actions that we ought to perform. As such, moral norms provide us with some consistency and stability in moral life by bringing about some depth and breadth to our moral judgments. They provide us with patterns for human conduct—“common denominators”. In short, moral norms help us to determine what is right and good

within a given situation. Moral norms can be positive (do unto others each according to his own) or negative (do not kill), general (be good) or specific (do not tell a lie).

Moral values are a set of principles that guide an individual in the evaluation of right versus wrong. Moral values form the basis to justify individual or collective decisions, intentions and actions; moral values are strictly dependent of culture and habits. Kinnier et al. (2000) have summarised the moral values as:

- (a) Commitment to something greater than oneself;
- (b) Self-respect and care for oneself;
- (c) Respect and care for others; and
- (d) Caring for other living things and environments.

Sometimes moral values may interfere in ethical reasoning before decision-making. Some of the moral values are listed below (Kinnier et al., 2000):

• Benefiting others	• Keeping promises
• Co-operation	• Kindness
• Compassion	• Loyalty
• Courage	• Patience
• Empathy	• Respect for others
• Forgiveness	• Responsibility for personal actions
• Generosity	• Self-control
• Honesty	• Tolerance

It becomes clear when comparing the lists of moral and ethical values that there is an overlap. In fact, it is extremely difficult to explain, by definition, the differences between the two. McNamara (2012) explains that “*a person who knows the difference between right and wrong and chooses right has got moral values*” (para. 3). On the other hand, if “*morality is reflected in his (sic) willingness to do the right thing – even if it is hard or dangerous – [then this] is ethical*” (McNamara, 2012, para. 3). In fact, ethics are moral values in action.

Further reading

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In Latin, **data** is the nominative plural of datum. The concept of data encompasses a wide range of factual material that is produced (collected) in scientific research such as numerical data, textual documents and materials, images, artefacts, audio or video materials and other. Collected raw data is further processed and analysed in order to generate scientific knowledge. For example, in the biomedical field, the term “data” represents the outcome of an experimental procedure. Examples of data are health statistics, sales figures, stock prices, geolocation co-ordinates, language corpuses, audio recordings, videos and images. Today in most cases data are digitally available objects (simple or complex), many of which emerge or are the results from research processes. In the process of data handling and management related to research, data are determined and collected to be further analysed and visualized.

We can distinguish various types of data:

Based on data preparation for analysis:

- “Raw data” is a collection of numbers, images, characters or videos before it has been “cleaned” and corrected by researchers (Benedetto, 2017).
- “Cleaned” or filtered data refers to data after the first stage of processing. After raw data is collected, it is important to comprehensively check it and correct data entry errors (Benedetto, 2017) (e.g. the age of a person must be between 0 and 120 years, so age less than 0 or age greater than 120 is a data entry error).

Based on the strategy of data collection:

- “Field data” is raw data that is collected in an “uncontrolled environment” (Benedetto, 2017) (e.g. from sensors on the person’s body, from environment outside the laboratory, landscape surveying measurements, from on-line surveys, qualitative interviews).
- “Experimental data” is data that is “generated within the context of a scientific investigation by observation and recording” (Benedetto, 2017, para. 3).

Based on the methodological approach:

- “Qualitative data” refer to data obtained using qualitative data collection methods (e.g., interviews, unstructured observations). It allows coding, grouping or categorizing attributes or characteristics of a phenomenon or a thing that has been researched. In statistics, qualitative data refer to categorical data (e.g., variables like eye colour, nationality, zip code represent different categories). Even when expressed in numbers (e.g., phone number) categorical variables are not numeric in nature and cannot be used for calculations as numbers (only as distinct categories).
- “Quantitative data” is numeric in nature and can be used for mathematical calculations and statistical analysis. Examples of quantitative data can be weight,

speed, income (if expressed in a numeric manner) or age (if expressed in number of years).

Based on the level of structuration of data:

- “Structured data” are any data that is clearly defined and formatted according to specific rules. This includes data contained in XML, RDF, JSON, object or relational databases, and spreadsheets.
- “Unstructured data” refers to data which do not have a predefined structure. Unstructured data files can include text and multimedia content, for example, e-mail messages, word processing documents, videos, photos, audio files, presentations, webpages, other kinds of business or research documents (Ronk, 2014), when they are not formatted (structured) in any specified or predetermined manner.

For researchers it is also important to have knowledge about the following types of data:

- “Open data” are “online, free of cost, accessible data that can be used, reused and distributed provided that the data source is attributed and shared alike” (FOSTER, n.d.).
- “Linked data” is a method of publishing structured data so that it can be interlinked and become more useful through semantic queries (Berners-Lee, 2006). Linked data may also be open data, in which case it is usually described as “linked open data” (LOD, n.d.).
- “Metadata” is data that provides information about other data (e.g. description about data in a data set). It is divided into descriptive metadata (is used for discovery and identification), structural metadata (is used for description of a structure of compound data objects) and administrative metadata (is used for data management) (Zeng, 2004).
- “Big data” is a term describing data sets that are so voluminous and complex that traditional data processing application software is unable to process them (Walker, 2015). Examples of big data sets are health data, corpuses of documents from the Internet, data from sensors from mobile phones and smart home devices and other. “*Big data challenges include capturing data, data storage, data analysis, search, sharing, transfer, visualization, querying, updating, information privacy, and data source*” (Udroiu and Bere, 2018, p. 7).

The term data is different from other related terms such as information or knowledge. **Knowledge** is something that we know; it is linked to the existence of a person or group of persons who know (Nagel, 2014). The key features of knowledge are facts (we can know only facts or true propositions) and confidence (actually knowing vs. thinking that we know) (Nagel, 2014). Knowledge is related to familiarity with facts, information or skills that can be gained either through formal education or experiences (English Oxford Living Dictionaries, n.d.). “While a set of data can be used as a unit to directly derive information, knowledge or wisdom is often derived in an indirect manner” (Mitra, 2019, para. 4). Therefore, **information** is related both to data and knowledge. One can derive

information from data; pieces of information then serve to understand concrete or abstract concepts, which creates knowledge. One example is data from a Web server. A server collects data about visits to a digital library, e.g. on every user's click on a web document the server logs the date and time of the visit, the IP address of the user, the URL address of the web document, the type of a browser used by the user. These data give information, such as how many users use the Chrome browser, how many users of our web page are from the UK, how many visits there have been to our web page on Sundays. Information is derived from data after it has been analysed in some fashion.

Knowledge can be explicit or implicit (tacit). Explicit knowledge is stored in books, encyclopaedias, documents, learning materials, web pages, etc. It can be easily reproduced. Examples of explicit knowledge are mathematical formula for Pythagoras theorem, description of the process of college enrolment or recipes for preparing simple dishes. Tacit knowledge is hidden in skills, ideas or experiences of persons that they have in their minds and is not easy to express or interpret; it is important to transfer tacit knowledge into more explicit forms, so that it is available for further reuse (Chugh, 2015).

One type of knowledge is “**common knowledge**” that in the definition of the Cambridge dictionary (n.d.) is “something that is known to many people but often not made known officially”. For example, everyone knows that *we use language to communicate with each other*. In the case of blending such an expression into your paper, you do not need to provide a citation as it is considered to be common knowledge. Common knowledge can be divided into smaller components. For example, field specific common knowledge refers to knowledge known by anyone within a specific field. Suppose that you are an applied linguist and, in your paper, you explain your readers that *there are four main language skills namely listening, speaking, reading, and writing*. Although an averagely educated person may not correctly name all these skills, you do not need to cite such an expression, as any applied linguist knows the interaction among these skills. However, there is a tricky point related to common knowledge. This time suppose that as an applied linguist you claim that *developing writing skills is the most difficult skill, compared to the development of other skills*. You need to provide evidence from empirical studies, or if relevant from your own research, to support your claim that developing writing skills is regarded as the most difficult of the four skills; any claims you make in your academic writing that are not common knowledge must be explicitly justified. As a rule of thumb, if you are not sure about it, it is safer to provide a citation rather than taking a risk.

Razi (2011) calls attention to expressions that might be non-academic and gives this example: “According to the results of a research study, female learners are more successful than male learners in terms of reading comprehension in a foreign language” (p. 190). Please note that the expression “research study” cannot be considered as an in-text citation since it does not provide any information about the source that such a claim depends on. Evidence is made available for the reader about the specific “research study” being discussed, through the citation and associated reference.

Also, it is important to note that “vague references to common and popular knowledge (e.g., *as we know*, *as people say*) function as hedges in conversational and informal registers” [emphasis original] (Hinkel, 2004, p. 325); therefore, such colloquial expressions should also be avoided in scholarly work.

To help you decide whether you need a citation or if your information can be considered as common knowledge and you don’t need a citation, ask yourself:

- Who is your audience?
- What can you assume they already know?
- Will you be asked where you obtained your information? (MIT, 2019, p. 8).

Also note that what may be considered “common knowledge in one culture, nation, academic discipline or peer group may not be common knowledge in another” (MIT, 2019, p. 8). When you are in doubt, it is recommended to cite your source.

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Guidelines about Institutional Culture and Practices

CULTURE OF ACADEMIC INTEGRITY | ETHICS INFRASTRUCTURE

The **culture of academic integrity** is an organisational spirit and climate that informs and promotes ethical behaviour and addresses ethical failures in effective and efficient ways. Cultures of integrity help to build communities of trust influencing strategies, conduct and activities throughout educational and research institutions. For example, honesty is needed so that students really learn and their degrees have value. A diploma from a university where honesty and academic integrity are not appreciated may not be valued by an employer when students enter the workplace, particularly if the diploma does not accurately represent the capabilities of the student. Also, when it comes to professional practice, it can be very risky for wider society to have people working in positions of responsibility without the required knowledge for that field, for example in medical, legal, engineering and accountancy professions.

Ethics infrastructure “consists of formal and informal systems – each including communication, surveillance, and sanctioning components – as well as the climates that support these systems” (Tenbrunsel et al., 2003, p. 287). This refers to ethics management tools, such as codes of ethics, hotlines, helplines, ethics committees, audit, diverse policies and procedures, ombudspersons.

ENAI recommendation

A key approach to counter academic misconduct and dishonesty in higher education is to develop institution-wide strategies to promote a culture of academic integrity through activities such as: the provision of guidance and education for all stakeholders about adoption of values associated with academic integrity (Honesty, Fairness, Trust, Responsibility, Respect, Courage (ICAI, 2014)); mentoring in responsible conduct of research; research policy development; institutional support for research ethics oversight; curriculum and assessment design and development; and ethical leadership.

Minimal requirements for the development of culture of academic integrity

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Tenbrunsel, A.E., Smith-Crowe, K., Umphress, E.E. (2003). Building houses on rocks: the role of the ethical infrastructure in organizations. *Social Justice Research*, 16(3): 285-307.

CODE OF CONDUCT | CODE OF ETHICS | ACADEMIC INTEGRITY COMMITTEE | DISCIPLINARY COMMITTEE | ETHICS COMMITTEE | RESEARCH ETHICS COMMITTEE | AUDIT

The terms “**code of ethics**” and “**code of conduct**” are often used interchangeably. Both code of ethics and code of conduct are used to encourage specific forms of behaviour by stakeholders, but whereas a code of ethics defines values and principles and is used for decision making, a code of conduct provides direction on application of the values and principles to specific situations (Nieweler, 2014).

Codes of ethics and codes of conduct can be developed for the purposes of a single institution, organisation, profession or for an association of institutions / organisations, for a professional field (e.g. code of ethics of lawyers), for research field (e.g. code of ethics for social research) or other settings.

There are several types of committees (or panels) related to academic and research integrity (such as academic integrity committee, disciplinary committee, ethics committee, research ethics committee), usually established at the level of university or faculty/school, according to national and university standards.

The roles of these committees may include:

- handling cases of student misconduct
- handling cases of staff misconduct
- approving research projects to mitigate risks related to research integrity (ethical approval)
- assessing and researching the institution’s status with regard to academic integrity (ethics assessment)
- developing standards and enforcement procedures related to academic integrity (policy to enhance academic integrity)
- reviewing scientific papers before they are submitted for publishing
- handling appeals from staff or students
- promoting appropriate standards of conduct

In public health research the research ethics committee or institutional review board (IRB) is constituted of independent individuals who have responsibility for ethical revision of protocols for research involving humans or animals (ethical approval), ensuring that protocols are ethically justified and have scientific merit, and that they will be developed in line with ethical principles.

For each committee, regulations or guidelines should define:

- purpose and mandate of the committee,
- composition of the committee,
- required qualification of the committee members,
- tenure of its members,

- procedure of appointing and removing its members,
- minimal frequency of meetings,
- detailed description of procedures for handling cases and decision making,
- procedures for considering appeals,
- list of possible outcomes (if applicable).

Including students in these committees is strongly encouraged (Morris, 2016, p. 407) (e.g. at the University of Insubria (Italy), the University's ethics committee is made up of five members, including a student (Commissione Etica di Ateneo, n.d.)). In some countries, e.g. Czechia (The Higher Education Act of the Czech Republic, n.d.), this is even required by law.

Auditing is one of the methods that can be used for evaluating the ethics infrastructure (so-called ethics management tools). There are several types of performance audit inherent to research and higher education, such as data auditing (e.g. examination of research records, policies, activities, personnel, or facilities to ensure compliance with ethical or legal standards or institutional policies (Resnik, 2015)); ethics audit (e.g. examination of compliance with the ethical standards of its organisation and stakeholders, including the society at large, including an assessment of systematic ethical issues; it is value-linked (Carmichael et al., 1998)). As Resnik (2015) suggests, “audits may be conducted regularly, at random, or for cause (i.e. in response to a problem)”.

ENAI recommendation

At the institutional level, both a code of conduct and a code of ethics should be adopted and made publicly available. These codes should be periodically reviewed; there should be a body/ bodies responsible for conducting these reviews, e.g. ethics committee.

Examples of guidelines on how to develop codes

Gilman, S. C. (2005). *Ethics Codes and Codes of Conduct as Tools for Promoting an Ethical and Professional Public Service: Comparative Successes and Lessons*. OECD study. Available at: <https://www.oecd.org/mena/governance/35521418.pdf> [9 March 2018]

Model Code of Ethics Principles. Professional standard councils, June 2002. Available at: <https://www.psc.gov.au/sites/default/files/Model%20code%20of%20ethics%20principles.pdf> [9 March 2018]

Examples of codes

ACM Code of Ethics and Professional Conduct. Available at: <https://www.acm.org/about-acm/acm-code-of-ethics-and-professional-conduct> [9 March 2018]

The European Code of Conduct for Research Integrity (revised edition) (2017). ALLEA - All European Academies. Available at: <http://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf> [9 March 2018]

The Netherlands Code of Conduct for Academic Practice: Principles of good academic teaching and research (first 2004; revised 2014). Available at: [http://www.vsnul.nl/files/documenten/Domeinen/Onderzoek/The_Netherlands_Code%20of_Conduct_for_Academic_Practice_2004_\(version2014\).pdf](http://www.vsnul.nl/files/documenten/Domeinen/Onderzoek/The_Netherlands_Code%20of_Conduct_for_Academic_Practice_2004_(version2014).pdf) [9 March 2018]

Examples of available guidelines or other information related to audit

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The Institutional Animal Care and Use Committee. National Institutes of Health Office of Extramural Research. Available at: <https://grants.nih.gov/grants/olaw/tutorial/iacuc.htm> [9 March 2018]

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DATA MANAGEMENT

The **management of data** should be systematically organised to appropriately process, store and access data. Effective data management is crucial for any research field with the aim of eliminating or minimizing potential risks that can occur at any stage of a project, from collecting to storing, analysing and sharing data.

It is recommended that researchers consider developing a data management plan to define in advance how data should be handled during the project and after its completion. A data management plan will ensure correct data format, organization and annotation, straightforward archiving into databases for subsequent analysis, easier reuse and avoidance of data loss. The plan should include information about data collection and analysis, data storage/preservation and reuse/redistribution. Also, effective data management helps to minimise the risk of data manipulation and falsification. At least one person should be designated in advance as a data manager.

Data repositories serve the purpose of accumulating, storing and sharing a variety of materials, for example, UK Data Archive; MIDAS, LiDA in Lithuania; R3data.

Examples of available guidelines for data management

Best practice guidelines on publishing ethics: a publisher's perspective, second edition. Wiley. Available at: https://authorservices.wiley.com/asset/photos/Ethics_Guidelines_26.04.17.pdf [13 March 2018]

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WHISTLEBLOWING | REPORTING IRRESPONSIBLE RESEARCH PRACTICES

All members of an academic community should be encouraged to report cases of misconduct and actions constituting potential risks. Institutions should adopt measures to protect whistleblowers and ensure that accusations are handled fairly even when high-profile people are involved.

It should be emphasised that **whistleblowing** is in the public interest. In some cultures, whistleblowing is perceived as a synonym to denouncing people, including its negative connotations. It should be clearly differentiated – denouncing is a negative act with the purpose of harming someone, whereas whistleblowing is a positive act with the purpose of cleaning the institution from negative behaviour and preventing damage to its reputation.

Institutions may also benefit from the possibility of anonymous whistleblowing, particularly for reporting corruption, for example by using hotlines or helplines. Ideally anonymous whistleblowing should be discouraged, because whistleblowers should be accountable for their actions.

Although whistleblowers are often motivated individuals acting alone, there are examples of networks and groups of volunteers that work together in an organised way to tackle more systemic corruption and malpractice. An example of such a network is the Dissernet organisation operating in Russia. This is a group of activists who are exposing high levels of plagiarism in theses and academic papers. They are especially focusing on doctorates conferred without merit on Russian academics and politicians (<https://www.dissernet.org/>; Wikipedia, n.d.). Another such example with a similar mission is the Vroni plag Wiki, maintained by a group of academics based in Germany (Vroni plag Wiki, n.d.). Some other examples of malpractice, often uncovered by investigative reporting, continue to be reported in the media (for example BBC Panorama 2017, BBC File on 4 2018). Cohen and Winch (2011) reported on the prevalence of diploma and accreditation mills operating out of different countries.

Although irresponsible research practices fall short of academic misconduct, they can cause significant reputational damage and loss of trust for individuals, teams and institutions. Such practices include failure to follow ethical guidelines, carelessness, improperly listing authors, failing to report conflicting data, or the use of misleading analytical methods (WCRI, 2010).

ENAI recommendation

Institutions of higher education and research, “as well as journals, professional organizations and agencies that have commitments to higher learning and research, should have [robust and transparent] procedures for responding to allegations of misconduct and other irresponsible research practices and for protecting those who report such behaviour in good faith. When misconduct or irresponsible research practice is

confirmed, appropriate actions should be taken promptly" (WCRI, 2010, point 12) to correct or retract any artefacts that are likely to mislead or cause harm. Those responsible for the irresponsible actions may be subject to sanctions and may be required to undergo training. In the case of whistleblowing about malpractice at the upper levels of the university, the situation should be reported to an independent committee on ethics and integrity that is external to the institution.

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RISK MANAGEMENT

Each research or research project has risks, which may be of many types, such as financial, legal, ethical, technological, methodological, physical, staff related, reputational.

Breaches of academic integrity can be related to (Baccarini and Melville, 2011):

- Research methodology (data falsification or manipulation, plagiarism, making unjustified claims);
- Funding (fraud, corruption, undeclared conflict of interests);
- Research subjects or other team members (physical or psychological harm, insufficient respect to other cultures, gender-based harassment);
- Procedures (unreported misconduct, consent denial, confidentiality breach).

The most severe breaches sometimes lead to negative media coverage and loss of reputation of the institution with possible serious financial consequences.

To deal with the risks, institutions should identify risks related (not only) to academic integrity and adopt measures to eliminate or reduce them. Where risks cannot be eliminated, the institution should prepare response scenarios for the case of occurrence of these risks. This applies especially to highly risk-sensitive research projects. In each project proposal, risks should be identified and measures to their mitigation or elimination should be taken.

According to Baccarini and Melville (2011), common **risk management** consists of:

- Communication and consultation with stakeholders;
- Establishment of the context for project risk management;
- Identification of risks – their causes, probability and impact;
- Evaluation of risks leading to their prioritisation;
- Treatment of risks – i.e. implementation of strategies to manage risk events;
- Monitoring and review of the project risk management process effectiveness.

These activities are in the core of project management of any research project and the project manager is directly responsible for their handling.

ENAI recommendation

Each research project should define potential risks by their likelihood, impact and deliver appropriate mitigation measures. Risk management plan should be monitored and revised when needed by a principal investigator as well as assisted by university internal body, such as institutional review board or other.

Identification of each risk includes its category, probability, indicators, impact, stakeholder(s) affected, countermeasure mechanism and person(s) responsible for

handling the risk. Appropriate risk management method should be chosen with regards to institutional policy, cultural context and research area.

Example of project risk management techniques

Cagliano, A.C., Grimaldi, S., Rafele, C. (2015). Choosing project risk management techniques. A theoretical framework. *Journal of Risk Research*, 18(2): 232-248. DOI: 10.1080/13669877.2014.896398

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GENDER-BASED HARASSMENT | EXPLOITATIVE RELATIONSHIPS

Exploitation can occur in power relationships, for example between student and supervisor or student and teacher, whereby the victim is under certain obligations to the exploiter and feels unable to refuse unfair or unjustified demands. Examples of **exploitative relationships**: when a supervisor demands to be listed as an author of a paper to which he did not contribute; a teacher requiring students to buy their text book or to have intimate relationship as a condition of passing the exam.

Gender-based harassment can include actions by students, academics, supervisors, peers and other individuals encountered during teaching, learning and assessment, industrial secondments, fieldwork or research. The intimidation and personal discomfort caused by such circumstances creates a barrier to educational progression, communication, mobility and scientific networking.

The Australian Government quality and standards agency responsible for higher education (TEQSA) has developed a Guidance Note on Wellbeing and Safety (TEQSA, 2018) that sets out the obligations of institutions for safeguarding their students and employees from a range of identified risks. The Guidance Note covers provision of (TEQSA, 2018, p. 2):

- Avenues and contacts for support for students if needed;
- Availability of specific types of personal support services;
- Ensuring that support service offered reflect the needs of student cohorts;
- Promotion of a safe environment;
- Management of critical incidents.

The Guidance note urges institutions to “take pre-emptive action to minimise incidents” (TEQSA, 2018, p. 5) rather than simply responding to grievances.

Some other examples of gender-based harassment include: a student facing sexual harassment or assault by a supervisor or colleague during a work placement off campus; harassment of a member of university staff (stalking) by a student; a teacher or student uses obscene humour or tells jokes about sex or any gender in general or assign gender-derogatory nicknames. In some cases, such misbehaviour can be treated both as a crime and an ethical infringement.

ENAI recommendation

To prevent gender-based harassment, regular training of the academic community is essential. Also, regular training is required for those who investigate such misbehaviour to ensure any cases are managed with sensitivity and appropriate remedies are applied.

Examples of guidelines and policies on gender-based harassment

Policy on preventing sexual and gender-based harassment. Approved January 27, 2011; updated May 2013. Ontario Human Rights Commission. Available at: <http://www.ohrc.on.ca/en/policy-preventing-sexual-and-gender-based-harassment-0> [25 May 2018]

Sexual Harassment Guidance: Harassment of Students by School Employees, Other Students, or Third Parties. Approved 13 March 1997; revised 16 October 2015. U.S. Department of Education. Available at: <https://www2.ed.gov/about/offices/list/ocr/docs/sexhar01.html> [19 September 2018]

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Guidelines about Science and Research

SCIENTIFIC ACTIVITY | RESEARCH | SCIENTIFIC WORK

Scientific activity could be understood as a process (e.g. ongoing study) and as an output (e.g. drug or tool development). All scientific activity implies the use of scientific method, which refers to the techniques used to formulate and test hypotheses or propositions (possible explanations for a certain phenomenon, which may or not be proven true), through the systematic use of observation, measurement and experimentation (Hoyningen-Huene, 2008). As a pedagogical term, scientific activities may also refer to scientific experiments used as a learning tool at all levels of education for introducing the scientific method to students.

Scientific work can be understood as a very broad term, referring not only to the production and publication of a scientific study, but also to the description of the scientist profession. Scientific work is particularly relevant for society when producing knowledge that allows the evolution of science (e.g. pioneering projects or revolutionary findings) contributing to enhance scientific literature, hence it should aim to inform assertively, and to be, as much as possible, highly reliable, pertinent, and clear (COPE, n.d.).

Research is a careful, systematic, persistent intellectual activity, which promotes the discovery of new facts and tests new ideas on a specific topic. Particularly associated to universities and public or private research organisations or academies of science, research creates opportunities for individuals to get involved in the conception or creation of new knowledge, products, processes, methods and systems, and in the management of projects, according to the Commission to the Council and the European Parliament (Researchers in the European Research Area, 2003).

According to Frascati (OECD, 2015, p. 28), research and experimental development (R&D) “*comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge*”. Different types of research such as applied, basic, correlational, experimental or qualitative can be conducted depending on the main and final goals of the research study.

Further reading

Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals (2017). ICMJE. Available at: <http://www.icmje.org/icmje-recommendations.pdf> [10 March 2018]

References

Committee on Publication Ethics: COPE | Promoting integrity in research publication. Available at: <https://publicationethics.org/> [10 March 2018] (cited as COPE)

Hoyningen-Huene, P. (2008). Systematicity: The nature of science. *Philosophia*, 36(2): 167-180.

OECD (2015). *Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development*, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris. DOI: <http://dx.doi.org/10.1787/9789264239012-en>.

Researchers in the European Research Area: One Profession, Multiple Careers (July 2003 COM (2003) 436 final). Brussels: Communication from the Commission to the Council and the European Parliament. Available at: https://cdn1.euraxess.org/sites/default/files/policy_library/careercommunication_en.pdf [10 March 2018]

SCIENTIST | RESEARCHER

A **scientist** is a person who establishes an active involvement in the scientific process. Different ways of being involved in the sciences can be studying it, being trained on it, teaching it or doing scientific work. For instance, a science enthusiast, who simply has an interest in scientific updates and, consequently, establishes a passive relation with science, is not included in this definition. Moreover, the terms "scientist" and "researcher" might have different connotations in some countries. For example, in Lithuania and Latvia, a scientist is a PhD holder while this qualification is not mandatory for a researcher.

A **researcher** is someone who conducts a diligent and systematic investigation or inquiry into a subject, field or problem to discover or revise facts, principles, theories or practical applications. Based on Frascati (OECD, 2015), the Commission to the Council and the European Parliament (Researchers in the European Research Area, 2003, p. 6) states that a researcher is a professional "engaged in the conception or creation of new knowledge, products, processes, methods and systems, and in the management of the projects concerned". According to the International Council for Science (ICSU, 2008), researchers hold responsibility to conduct and communicate their research ethically, with honesty, integrity and respect; as a community, researchers share responsibility to promote science for the benefit of society and avoid potential dangers arising from the application of science. They are also responsible for, and have the need to pro-actively engage in, their own personal and career development, and lifelong learning, since they are equipped and supported to be adaptable and flexible in an increasingly diverse, mobile, global research environment (Concordat to Support the Career Development of Researchers in UK, 2008).

The European Charter for Researchers (2005) set out the following responsibilities for researchers: research freedom, ethical principles, professional responsibility, professional attitude, contractual and legal obligations, accountability, good practice in research, dissemination and exploitation of results, public engagement, relationship with supervisors (and managers), supervision and managerial duties and continuing professional development.

References

Researchers in the European Research Area: One Profession, Multiple Careers (July 2003 COM (2003) 436 final). Brussels: Communication from the Commission to the Council and the European Parliament. Available at: https://cdn1.euraxess.org/sites/default/files/policy_library/careercommunication_en.pdf [10 March 2018]

Freedom, responsibility and universality of science. Paris: International Council for Science (ICSU), 2008. (cited as ICSU)

OECD (2015). *Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development*, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris. DOI: <http://dx.doi.org/10.1787/9789264239012-en>.

The Concordat to Support the Career Development of Researchers - An Agreement between the Funders and Employers of Researchers in the UK. June 2008. Available at:
<https://www.sussex.ac.uk/webteam/gateway/file.php?name=vitae-concordat-2011.pdf&site=377> [10 March 2018]

The European Charter for Researchers. 2005/251/ES, Official EU Bulletin dated 22 March 2005. Available at: <https://euraxess.ec.europa.eu/jobs/charter/european-charter> [10 March 2018]

RESEARCH ETHICS | RESEARCH INTEGRITY | RESEARCH FRAUD | RESEARCH MISCONDUCT

In general, **research ethics** is understood as having a broader sense than research integrity. Nevertheless, both terms are applied in an overarching manner.

As Beauchamp and Childress (2013) claim, researchers should adhere to the recognised ethical practices and fundamental ethical principles appropriate/specific to their discipline(s), as well as to ethical standards, as documented in the different national, sectoral or institutional codes of ethics. In addition to this, the European Code of Conduct for Research Integrity summarises the main rules of conduct for a researcher to follow according to the definition of “integrity” (ALLEA, 2017) and gives a complete and exhaustive definition of **research integrity** requiring that research should be conducted according to the four principles of reliability, honesty, respect and accountability.

Research fraud refers to the infringement of ethical principles in research while **research misconduct** explains the locus of occurrence of misbehaviour. To deal with these misbehaviours the Committee on Publication Ethics (COPE) provide guidelines on how institutions and journals should respond to research misconduct in publications and publishing.

Reasons for research fraud and research misconduct in academia include career pressure (“publish or perish” is commonly stated in academia) or the difficulty to reproduce some results, which can induce the researchers to “manipulate” data (reported in guidelines for data fabrication/falsification) (e.g. Breen, 2003; Brice and Bligh, 2004; Fanelli et al., 2015; Kumar, 2008; van Dalen and Henkens, 2012).

Examples of available guidelines for handling research fraud/misconduct, enhancing research integrity

COPE. Guidelines. Available at: <https://publicationethics.org/resources/guidelines> [9 March 2018]

The European Code of Conduct for Research Integrity (revised edition). All European Academies, 2017. Available at: https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/h2020-ethics_code-of-conduct_en.pdf [9 March 2018]

Research Misconduct Procedures & Guidelines. University of Colorado Boulder, Research & Innovation Office. Available at: <https://www.colorado.edu/researchinnovation/rcr/research-misconduct/procedures-guidelines> [9 March 2018]

Research Integrity. National Institutes of Health, Office of Extramural Research. Available at: https://grants.nih.gov/grants/research_integrity/research_misconduct.htm [9 March 2018]

Public Health Service Policies on Research Misconduct; Final Rule 42 CFR Parts 50 and 93 (Part III). In: *Federal Register on May 17, 2005.* Department of Health and Human Services. Available at: https://ori.hhs.gov/sites/default/files/42_cfr_parts_50_and_93_2005.pdf [9 March 2018]

Further reading

Resources for Research Ethics Education. Available at: <http://research-ethics.org/introduction/what/> [10 March 2018]

References

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- Beauchamp, T.L., Childress, J.F. (2013). *Principles of Biomedical Ethics*, 7th Edition. Oxford: Oxford University Press.
- Breen, K.J. (2003). Misconduct in medical research: whose responsibility? *Internal Medicine Journal*, 33: 186-191.
- Brice, J., Bligh, J. (2004). Author misconduct: not just the editors' responsibility. *Medical Education*, 39: 83-89.
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- van Dalen, H.P., Henkens, K. (2012). Intended and unintended consequences of a publish-or-perish culture: A worldwide survey. *Journal of the American Society for Information Science and Technology*, 63(7): 1282-1293.

RESPONSIBLE CONDUCT OF RESEARCH | QUESTIONABLE RESEARCH PRACTICES

Responsible conduct of research (RCR) is the practice of scientific activity that leads to sound and ethical science and ultimately to public confidence in scientists and scientific knowledge. Science must be done in an honest, accurate and unbiased way and RCR guidelines promote adherence to the highest scientific and ethical standards. The four basic sources of rules for the RCR are professional codes, government regulations, institutional policies, and personal convictions.

Various practices can be considered as **questionable research practices** (QRPs), for example, carelessness or negligence in the handling of research results, unreported conflicts of interests (Research Integrity and Compliance, n.d.), biased reporting of results, augmented publication, and gift or guest authorship. According to the USA National Academy of Sciences, National Academy of Engineering, & Institute of Medicine (1992, as cited in Agnoli et al., 2017, p. 1), QRPs are “methodological and statistical practices that bias the scientific literature and undermine the credibility and reproducibility of research findings”. QRPs do not reach the level of research misconduct, though they still foster concerns regarding quality and credibility of research and science (Banks et al., 2016; Research Integrity and Compliance, n.d.). In addition to this, Martinson et al. (2005) claimed serious misbehaviour in research damages the reputation of, and undermines public support for, science, and that sometimes lesser forms of research misbehaviour may be more damaging in undermining public confidence in science due to their much higher visibility and prevalence.

The first comprehensive list of major and minor research misbehaviours covering all disciplinary fields was published by Bouter et al. (2016).

ENAI Recommendation

RCR training is mandatory for all undergraduate and graduate students and researchers supported by funding agencies.

Examples of available guidelines for responsible conduct of research

Steneck, N.H. ORI Introduction to the Responsible Conduct of Research. Available at: <https://ori.hhs.gov/ori-introduction-responsible-conduct-research> [10 March 2018]

10 Guidelines for the Responsible Conduct of Research. In: *Responsible Science: Ensuring the Integrity of the Research Process: Volume II*. National Academy of Sciences (US), National Academy of Engineering (US) and Institute of Medicine (US) Panel on Scientific Responsibility and the Conduct of Research. Washington (DC): National Academies Press (US); 1993. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK236192/> [10 March 2018]

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Agnoli, F., Wicherts, J.M., Veldkamp, C.L., Albiero, P., Cubelli, R. (2017). Questionable research practices among Italian research psychologists. *PLoS One*, 12(3): 1-17. doi: 10.1371/journal.pone.0172792.

Banks, G.C., Rogelberg, S.G., Woznyj, H.M., Landis, R.S., Rupp, D.E. (2016). Editorial: Evidence on Questionable Research Practices: The Good, the Bad, and the Ugly. *Journal of Business Psychology*, 31(3): 323-338. doi: 10.1007/s10869-016-9456-7.

Bouter, L.M., Tjldink, J., Axelsen, N., Martinson, B.C., ter Riet, G. (2016). Ranking major and minor research misbehaviors: results from a survey among participants of four World Conferences on Research Integrity. *Research Integrity and Peer Review*, 21: 1-17. doi: 10.1186/s41073-016-0024-5.

Martinson, B.C., Anderson, M.S., de Vries R. (2005). Scientists behaving badly. *Nature*, 435 (7043): 737-738. doi: 10.1038/435737a PMID: 15944677.

Research Integrity and Compliance. MIT. Available at: <http://research.mit.edu/research-integrity-and-compliance/general-misconduct-and-questionable-research-practices> [9 March 2018]

Responsible science: Ensuring the integrity of the research process (Vol. I). National Academy of Sciences, National Academy of Engineering, & Institute of Medicine. Washington, DC: National Academy Press, 1992.

Assessment of ethical principles is part of the process of ethical review and approval. Typically, the Principal Investigator responsible for conducting the research is required to identify any risks associated with both the study and chosen methodology and explain how these risks will be managed and mitigated. The assessment should be carried out by a nominated ethical panel or individual research-active senior academic (not necessarily officially assigned to this duty), after appropriate training. For example, in the supervisor-doctoral student relationship the supervisor should not carry out ethics assessment for the student due to related research (conflict of interest) and possible subjectivity.

Ethical approval is usually carried out at institutional/organisational level and may incorporate legislative guidance from a law society or government organisations. Before research begins the design and plans should be subjected to an ethical approval process. The approval process will normally include questions about social responsibility, rigour of research methods and processes, duty of care for living subjects of research (humans and animals), identification and management of associated risk factors, compliance with any regulations and theoretical underpinnings (Brall et al. 2017). Although there are many excellent guidelines on ethical approval, there is no single universal approach that can fit all research situations.

Corey et al. (1998) have provided an ethical decision-making model, which is used by many organisations during their ethical approval process (as quoted in Cottone and Claus, 2000):

- Step 1: Identify the problem
- Step 2: Identify the potential issues involved.
- Step 3: Review relevant ethical guidelines.
- Step 4: Know relevant laws and regulations.
- Step 5: Conduct consultation.
- Step 6: Consider possible and probable courses of action.
- Step 7: List the consequences of the probable courses of action.
- Step 8: Decide on what appears to be the best course of action.

Ethical approval helps to prevent any possible harm [resulting from educational activities or research] that must be avoided or at least mitigated by robust precautions.

Proactive actions to safeguard against identifiable risks (personal, social or other) include informing and warning society and the scientific community of the possible consequences of mishaps, abuse or refusal to cooperate with protective measures put in place. One of the remedies is requiring informed consent whenever human subjects are involved as participants in research.

As scientific research can only involve human subjects if their participation is voluntary, **informed consent** (written or oral consent, permission, and assent) is mandatory, particularly in the medical profession, in sociology and sometimes in law (Code of Human Research Ethics, 2010). An oral form of consent may sometimes be used in social research (e. g., it can be voice recorded). In biomedical research, only written consent is acceptable evidence, obtained under a voluntary participation policy, which refers to a “human research subject's exercise of free will in deciding whether to participate in a research activity” (Hogan, 2008, p. 952).

Guidance information provided to participants prior to receiving informed consent may differ depending on type of research, scientific field, institutional specificities or other circumstances. Usually, the following general elements are included: title and aim of a research, responsible institution and (or) person, contact person, explanation of the role of research participant, explanation of ethical considerations, explanation of treatment of personal data, explanation of treatment of information provided by research participant, explanation of possible risks. As stated by the Royal College of Nursing, freely given informed consent is central for ethical research when human participants are involved and “it is bound by ethical and legal frameworks” (RCN, 2011, p. 6). Furthermore, there can be specific requirements related to certain types of research. For example, in social sciences research it is necessary to receive assent to make a voice or video record. In the case of longitudinal study, re-consenting can be obtained informally (i.e. verbally) at times, provided the formal consenting is revisited at a predetermined point in time (Durham, 2014).

The primary purpose of informed consent is to protect the subjects of research. It also serves to protect the researchers/clinicians from accusations of negligence, failure to inform or disclose. Therefore, it requires a balanced and interactive discussion of (a) benefits and risks, (b) alternatives to the method/procedure/treatment, and (c) why that procedure/method/treatment was selected over the other alternatives (Chico and Taylor, 2018). Also, in the case of patient treatment, it should also require a clear discussion of what could happen if the patient elects to have no treatment, etc.

Whenever minors, or other persons considered unable to give their informed consent, are involved as research participants, informed consent must be provided by their parents or guardians. In addition, assent from the participants themselves should be provided when possible.

Researchers must ensure that the informed consent evidence is suitably documented and stored safely and confidentially. Written informed consent forms must be signed both by a researcher and either the participant or parent / guardian, before the research begins.

Examples of informed consent forms

Forms & Consent Templates. Stanford University Research Compliance Office. Available at: https://humansubjects.stanford.edu/new/resources/forms_templates/ [11 March 2018]

Informing participants and seeking consent (Last updated on 19 Mar 2018). Health Research Authority. Available at: <https://www.hra.nhs.uk/planning-and-improving-research/best-practice/informing-participants-and-seeking-consent/> [11 March 2018]

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- Chico, V., Taylor, M.J. (2018). Using and Disclosing Confidential Patient Information and The English Common Law: What are the Information Requirements of a Valid Consent? *Medical Law Review*. 26(1): 51-72.
- Code of Human Research Ethics*. The British Psychological Society, 2010, 2nd edition. Available at: <https://www.bps.org.uk/sites/beta.bps.org.uk/files/Policy%20-%20Files/BPS%20Code%20of%20Human%20Research%20Ethics.pdf> [11 March 2018]
- Corey, G., Corey, M.S., Callanan, P. (1998). *Issues and ethics in the helping professions* (5th ed.). Pacific Grove, CA: Brooks/Cole.
- Cottone, R.R., Claus, R.E. (2000). Ethical Decision-Making Models: A Review of the Literature. *Journal of Counseling & Development*, 78(3): 275-283. DOI:10.1002/j.1556-6676.2000.tb01908.x
- Durham, J. (2014). Ethical challenges in cross-cultural research: a student researcher's perspective. *Australian and New Zealand Journal of Public Health*, 38: 509-512. DOI:10.1111/1753-6405.12286
- Hogan, S.O. (2008). Voluntary Participation. In: *Encyclopedia of Survey Research Methods*, ed. T. J. Lavrakas. <http://dx.doi.org/10.4135/9781412963947.n629>. Online Publication Date: January 1, 2011.
- RCN (2011). Informed consent in health and social care research. In: *RCN guidance for nurse's Second edition*. The Royal College of Nursing, 2011.

CONFIDENTIALITY | CONFIDENTIALITY VIOLATION

From 2016 the EU introduced General Data Protection Regulation (GDPR), with full compliance by all member states mandated from the 25th May 2018. This legislation sets out both obligations and rights of individuals, companies, institutions regarding the storage, maintenance, use and protection of private data. For example, in the context of education and research, this applies to personal “*data pertaining to human subjects, papers or research proposals submitted for peer review, personnel records, proceedings from misconduct inquiries or investigations, and proprietary data*” (Resnik, 2015).

Confidentiality should also apply to “pseudonymisation” where it can partially identify the subject of research.

A breach of confidentiality can constitute serious academic misconduct. This can occur when appropriate procedures have not been put in place to manage and safeguard personal or sensitive data.

ENAI recommendation

Institutional rules related to ensuring confidentiality should be in compliance with laws, clearly described and elucidated to the academic community. To prevent violations of confidentiality it is recommended that when planning research this issue is considered in both the data management strategy and within the risk management plan.

References

GDPR Portal: *The EU General Data Protection Regulation*. Available at: <https://www.eugdpr.org/> [27 April 2018]

Resnik, D.B. (2015). *Glossary of Commonly Used Terms in Research and Ethics*. National Institute of Environmental Health Science, National Institutes of Health, May 2015. Available at: <https://www.niehs.nih.gov/research/resources/bioethics/glossary/index.cfm> [14th August 2019]

Guidelines about Academic Writing and Publishing

Copyright is regulated by national legislation.

The Berne convention clauses, first accepted in 1886, served for many European countries to substantiate national copyright laws (WIPO, 1886). Hence, all kinds of rights, including moral, ethical and others related to intellectual property are described in national legal regulations, e.g. Republic of Lithuania Copyright Law, UK Intellectual Property and Copyright Law.

Authors as owners of the intellectual property rights (IPR) for their work may agree assignment of their IPR to third parties. As Resnik (2015) states, copyright laws also describe “a fair use exemption which allows limited, unauthorized uses for non-commercial purposes”.

There are differences between countries in intellectual property rights related to works produced by students in connection with their studies. In many countries (e.g. UK, Republic of Ireland, Lithuania) the IPR for work undertaken by undergraduate and postgraduate students that relates to their studies rests with the higher education institution rather than with the students. However, in some other countries (e.g. Germany) where the rights remain with the students, difficulties can arise relating to how student work is stored and used, particularly uploading student work to text-matching software.

ENAI Recommendation

It is advisable to check the copyright restrictions on any artefact that someone intends to use, e.g. there may be a fee for its use or restrictions on how it may be used; if it is “open access” it may be free for personal use, but not for commercial use.

It is advisable to discuss IPR and reach agreement in advance about any copyright issues in all cases for artefacts produced in relation to an institution, a project or other co-operative settings.

Higher education institutions should explicitly inform students of the situation in relation to the IPR of the works that they produce during their studies. Students should also be made aware whether their assignments will be collected and stored in repositories accessed by text-matching software, for comparison to other works. Higher education institutions should provide guidance for their students in registering patents or brand names.

Examples of national copyright laws

Seimas (2016). *Republic of Lithuania Copyright Law* (version valid from 1 June 2016). Available at: <https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/5d10f130b83f11e5be9bf78e07ed6470?positionInSearchResults=0&searchModelUUID=40ad19a7-b6ff-45e5-8c77-628ca56096a9> [24 February 2018]

UK Government (n.d.). *UK Intellectual Property and copyright law*. Available at: <https://www.gov.uk/topic/intellectual-property/copyright> [9 March 2018]

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Resnik, D.B. (2015). Glossary of Commonly Used Terms in Research Ethics. National Institute of Environmental Health Science, National Institutes of Health. Available at: <https://www.niehs.nih.gov/research/resources/bioethics/glossary/index.cfm#a750735> [24 February 2018]

WIPO (1886). *The Berne Convention for the Protection of Literary and Artistic Works*. World Intellectual Property Organization, 1886. Available at: <http://www.wipo.int/treaties/en/ip/berne/> [24 February 2018]

AUTHOR | AUTHORSHIP | CO-AUTHOR | CORRESPONDING AUTHOR | CONTRIBUTORSHIP | UNETHICAL AUTHORSHIP | AUTHORSHIP ABUSE | GIFT OR GUEST AUTHORSHIP | COERCION AUTHORSHIP | GHOST AUTHORSHIP | GHOST WRITER | GHOSTWRITING | INVENTED AUTHORSHIP

General definition and criteria

In science, **authorship** is a fundamental component in research accountability towards stakeholders and society. For researchers, authorship is the basis for individual credit and reputation, and may be important for academic career advancement, social acknowledgement and popularity, economic and financial revenues, etc. While in general an **author** can be defined as anyone who contributed to the creation of an original work, criteria for authorship may be different across academic disciplines. An increasing number of academic institutions, scientific societies and scientific journals are developing specific guidelines for authorship assignment.

In medicine and related biological areas, the most acknowledged guidelines are those from the International Committee of Medical Journal Editors (ICMJE; see <http://www.icmje.org/>), which include the following criteria: (i) substantial contributions to conception or design of the work, or acquisition, analysis, or interpretation of data, (ii) drafting the work or providing critical revision of the contents, (iii) final approval of the version to be published, (iv) agreement to be accountable for all aspects of the work. All the criteria must be fulfilled to qualify as an author, and all those who fulfil the four criteria should be included among the authors. ICMJE guidelines do not address the issue of the order in which authors are listed, which is usually based on consideration of relative roles and contributions provide by co-authors. The first author, who has the major visibility, is often the one who did most of the work. The corresponding author may be either the first or the last of the co-authors, however exceptions are frequent. With the increasing importance given to the order and roles of authors, it is becoming increasingly common for publications to designate two or more first, last and/or corresponding authors, even if this raises ethical and methodological questions.

Other scientific areas, especially those dealing with big data and large collaborations (e.g. in physics), the criteria may not be so strict and well-defined. For example: the co-authors may be listed in alphabetical order; the list of authors may include people who are unfamiliar with this specific study or manuscript. The latter example, while possibly accepted within a defined discipline, would nonetheless deserve careful assessment for their ethical sustainability. Indeed, it might be argued that for anyone to qualify as author they should provide intellectual contributions to the study.

Contributorship is often considered as synonymous with authorship; however, it might also include contributions from subjects who do not fully meet authorship criteria. Their contributions should be noted in a specific section within the manuscript, such as “acknowledgements”.

Responsibility for authorship assignment

The Committee on Publication Ethics (COPE; see <https://publicationethics.org/>) recommends that the subject of authorship is raised right at the start of a study, and that authorship is discussed regularly throughout the study's evolution. Keeping written records of discussions and agreements is also recommended. Everyone should be kept informed and involved about any changes by means of written notes. According to the ICMJE, authorship assignment is the responsibility of individuals who conduct the work. There is general agreement that authorship disputes should be arbitrated by the researchers themselves and/or by academic institutions (and not e.g. by journals or journal editors).

The ICMJE clarifies that criteria for authorship should not be used to exclude any potential contributor, and that anyone who meets criteria such as design of the work and/or data acquisition and interpretation should be also given the opportunity to be involved in writing and approving the eventual manuscript.

While it might be easily understood that a young researcher might find it hard to engage with a senior researcher in a discussion about authorship, this consideration just raises the importance of the need for clear and preliminary establishment of authorship criteria and for the training of researchers (and in particular of principal investigators and supervisors). In case disputes arise, as far as possible they should remain amicable and not accusatory. It can be useful to examine how authorships were decided and to discuss how the work would have looked in the absence of a specific contribution.

Academic institutions should be responsible for the development and adoption of sound guidelines approved by the academic community, and for the subsequent training. In addition, they should have procedures to deal with authorship disputes (e.g. ombudsperson, independent committees, and offices for research integrity).

Finally, it is strongly recommended that anyone who meets criteria for authorship will be included among co-authors, irrespective of her/his position in the academic institution (including technicians and students). A section detailing co-authors' individual contributions (possibly in relation to the criteria adopted to decide about authorship) should always be included at the end of a manuscript.

Unethical authorship

Authorship is fundamental to accountability in scientific research and, as a consequence, unethical allocation of authorship credit is considered as scientific misconduct. **Unethical authorship**, which also may be defined as **authorship abuse**, includes listing as authors people who provided little or no contribution to the study (gift, guest and honorary authorship), as well as excluding people who, on the contrary, deserved authorship credit.

Gift or guest (honorary) **authorships** are often imposed by individuals (e.g. senior scientists, heads of laboratories and departments), and in this case they might be also defined as **coercion authorships**. Such situations should be always reported to the body responsible for considering accusations of misconduct. A fair way to deal with coercion authorships is to include a paragraph in the manuscript detailing co-authors' individual contributions, and a second paragraph acknowledging all the other contributions that do not qualify for authorship. For example, just being the head of the lab/department and/or just providing funding for the research does not qualify for authorship. Nonetheless any contribution should be appropriately acknowledged. In fact, many scientific journals are now expecting a “statement of authorship” detailing the contributions of each listed author. Though not consistent amongst journals, some editors expect an authorship declaration from each author. The expectation by the International Committee of Medical Journal Editors (ICMJE), as set out in their guidelines, is that a listed author should have “substantially” contributed to the study (ICMJE, n.d.). However, it is not clear whether these strict guidelines are being adhered to by all academics/authors.

A peculiar kind of authorship abuse is the inclusion of senior scientists and/or departmental leads as co-authors with or without their knowledge. Such behaviour, often occurring together with data fabrication/falsification, usually aims at increasing the impact of a study and/or the reputation of the leading author, by showing that s/he has established collaborations with a well-known senior colleague. Such occurrence looks like a mix between honorary and coercion authorship. Likewise, some academics ostensibly expect authorships just by providing samples, reagents or critical advice; such contributions should be in fact recognised in the acknowledgement section (rather than authorship as such).

Omission from the list of authors of people who would qualify for authorship may occur without or with their knowledge and consent. In the latter case, this kind of authorship abuse is usually defined as ghost authorship. **Ghost authors** are those who write or prepare a text for publication, often on commission and upon payment. In pharmaceutical industry-sponsored publications, the listed authors may include complimentary or honorary authorships based on scientific reputation, to increase the impact of the publication, even if they do not qualify for authorship (Roper and Korenstein, 2015; Ross et al., 2012). The term ghost writer usually refers to a professional author who willingly takes part, or helps in writing articles, reports, or texts, that are officially credited to another person.

From a general point of view, a **ghost writer** may or may not be a professional writer with or without financial gains. It should be emphasised that a person who writes for others without financial gains, with the aim of giving them “an unfair advantage” is also a ghost writer. However, care should be taken to interpret the term “ghost writer” when dealing with autobiographies that are mostly written collaboratively by a named author and ghost-writer, speeches for politicians and other cases, which are considered ethically acceptable, provided the use of the ghost-writer is properly acknowledged.

However, in reality, especially in the autobiographies of celebrities, the publishing industry accepts that the book is mainly written by the ghost writers who would remain anonymous. On the other hand, some autobiographies are mostly written collaboratively by a named author and the ghost writer. These are considered as ethically acceptable writing practices, provided the ghost writer is properly acknowledged.

Ghost writers are being used in academia, journalism, professional novel writing, and cinema and in music industry. Sometimes ghost writers are being used to either edit or rewrite their scripts to improve them (Sivasubramaniam et al., 2016).

Finally, **invented authorship** may either overlap with coercion authorship or actually indicate authorship attribution to a fictitious character, as in the case of Ike Antkare (which reads like "I can't care"), a fictitious researcher who authored computer-generated nonsense papers to demonstrate the flaws of automatic citation rankings of scientists, or Stronzo Bestiale ("total asshole"), a fictitious name included among the authors of a real paper.

ENAI Recommendation

When there is a case of unethical authorship it is recommended that the allegation of authorship abuse is reported either to a publisher or the Academic Integrity Committee within an institution.

Examples of authorship disputes and abuses from COPE

Cases: authorship and contributorship. Committee on Publication Ethics. Available at: https://publicationethics.org/cases?f0%5B0%5D=im_field_classifications%3A2772 [26 April 2018]

Examples of guidelines on authorship

Authorship and contributorship. COPE - Committee on Publication Ethics. Available at: <https://publicationethics.org/authorship> [26 April 2018]

Defining the Role of Authors and Contributors. ICMJE - International Committee of Medical Journal Editors. Available at: <http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html> [26 April 2018]

Guidelines on Authorship. University of Cambridge, UK. Available at: <https://www.research-integrity.admin.cam.ac.uk/research-integrity/guidelines-authorship> [26 April 2018]

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Defining the Role of Authors and Contributors. ICMJE - International Committee of Medical Journal Editors. Available at: <http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html> [26 April 2018]

Roper, N., Korenstein, D. (2015). Industry Collaboration and Primary Guest Authorship of High-Impact Randomized Clinical Trials: A Cross-Sectional Study. *Journal of General Internal Medicine*, 30(10): 1421-1425.

Ross, J.S., Gross, C.P., Krumholz, H.M. (2012). Promoting transparency in pharmaceutical industry-sponsored research. *American Journal of Public Health*, 102(1): 72-80.

Sivasubramaniam, S.D., Kostelidou, K., Ramachandran, S. (2016). A close encounter with ghost-writers: an initial exploration study on background, strategies and attitudes of independent essay providers. *International Journal for Educational Integrity*, 12: 1. doi.org/10.1007/s40979-016-0007-9

In academic writing correctly formatted citations are required to identify the source of ideas or facts. The referencing style may vary depending on several factors including the type of writing, the topic and the specific discipline and/or area of research, the type of publication (e.g. the journal/book/thesis), and the publisher. **Citation** by other authors is fundamental to the recognition of an author's merit in science. Citation is mainly recognized in two forms, namely as an 'in-text citation' and a 'reference'. The former in general refers to the inclusion of content using the three techniques of paraphrasing, summarizing, and quoting from the named source. It should be noted that all sources that are cited in the text must be written as reference entries at the end of the text so that readers who would like to read these cited sources can retrieve more detailed information. Please note that some citation styles (e.g., MLA style) may encourage the integration of sources as reference entries that are not cited in the text; however, other styles (e.g. APA style) require the exact match between in-text citations and reference entries.

Paraphrasing is a legitimate way of referring to other sources to support your ideas in academic writing. It involves three essential steps of restructuring the original expression, rewording and changing words with their synonyms, and finally acknowledging the original source. However, it may not be possible to change all the words because of the terminology involved in the original expression. Therefore, before replacing words with their synonyms, it is necessary to differentiate the terms that should stay the same in the paraphrased expression from the other words that should be replaced with their synonyms. Also paraphrased and original expressions should not necessarily be of similar lengths. For novice authors, it could be a good strategy to read the original expression several times and check for any possible comprehension problems before proceeding with the further steps of paraphrasing (Razi, 2011). In order to make structural changes with the original expression, you may consider active-passive transformations, breaking up lengthy expressions or merging shorter ones. When it comes to changing words, it is not required that every word is replaced with a synonym. Indeed, you are not allowed to do this since some key terms must be the same in the two versions. However, for dealing with other simple words, it could be a good strategy to refer to a digital corpus in order to find an appropriate synonym or a similar phrase. For example, WordsAndPhrase.Info (Word and Phrase.Info, 2018) or Academic Phrasebank (University of Manchester, 2018) provides a free digital platform to do this. In the case of paraphrasing lengthy expressions from the same source, you may consider using pronouns, linking devices, and markers in order to connect ideas to each other; otherwise, repetitive use of the author's surname and date of publication will make the text difficult to read. In this case, you can cite the original source in the first sentence and relate following sentences by using pronouns, linking devices and markers. Parenthetical citations styles usually require the use of author's surname and date of publication in terms of year for a proper citation. However, page numbers may also be

incorporated if you wish to direct your readers' attention to a specific page in a lengthy text (APA, 2010). In numerical referencing styles (e.g. Vancouver (Monash University library, 2018), IEEE (IEEE, 2018)) at the point to reference on a source is used a number in superscript¹ or brackets (round (1), square [1]). In reference list is given full details of each source in numerical order that readers can find sources by numbers before sources. Paraphrasing is a legitimate form; therefore, cannot be regarded as plagiarism as long as the sources are correctly cited. Find-replace plagiarism is false paraphrasing by changing single words by synonyms and not citing the source.

Problems can arise with paraphrasing when writers re-express the content of survey articles in which other studies are cited by paraphrasing. Survey articles usually summarise the findings and arguments of other studies so that readers get an overview of the research field. Rewording of text from secondary sources may change the meaning of the ideas expressed in the original articles. Therefore, in the case of paraphrasing such studies, authors are expected to find the original research article and then read and carefully summarize the primary source.

University of Louisville Writing Center (2018, para. 6) provides the following example of paraphrasing.

Original quotation: "In the case of Facebook, it has changed its format multiple times, and merged other literacy practices – email, instant messaging, games – into its structure in an attempt to keep users on the site" (Keller, 2014, p. 74).

Paraphrase: Facebook has tried to hold on to its users by incorporating new functions like games and email (Keller, 2014).

Summaries are technically very similar to paraphrases. In summaries, the aim is transferring the main ideas by using your own words. As with paraphrasing, it is important to attribute the summarized ideas to the original source. The only difference between paraphrased and summarized expressions is related to the length. Although paraphrased expressions are usually of similar length to the original text. As the name suggests, summaries are much shorter than the original expressions. Summaries may be useful in case of informing readers about a lengthy work such as an article or a book by focusing only on the parts that are relevant to the discussion.

Quoting is another recognised and legitimate way of blending other sources to support your claims in academic writing. The difference from paraphrasing is that quotations are expected to be identical to the original expression. The reason for integrating a quoted expression is providing stronger support to your discussions. In this respect, there should be a specific reason for directly quoting from another source. Usually, it is considered beneficial to directly quote from an authority. It is inadvisable to quote excessively as this decreases the impact of quotations for the readers. It is also a good idea to check for any specific limitations set by the publisher to avoid violating copyrights. It is also important to engage the quoted expression within your own discussions. Although quotations are identical to the original expression, there might be some exceptions. For example, you may wish to remove some words or expressions from the text you use to form your quotations and if you do this you need to inform your

readers about these changes. For example, in APA style (APA, 2010), you need to place three spaced ellipsis (...) to highlight an omission of any expression within a sentence; whereas you need to use four points (....) to call attention to an omission between two sentences. You may also add emphasis (e.g. italics) within quotations; please, insert [emphasis added] just after the emphasised expression. To avoid any plagiarism concerns, it is extremely important to inform the readers that the expression has been borrowed from another source. To do this, in recognised referencing styles quotation marks are used, either single or double. As this is a vital issue, you are strongly recommended to check this with the publisher's guidelines. In the case of quoting from another source, you need to mention the related page number(s).

See the following samples that are borrowed from Razi (2011) to recognize differences in the application of in-text citation techniques.

Sample 1: Short quotation (Razi, 2011, p. 159)

According to Alderson (2000, p. 25), "what it means to be literate, how this literacy is valued, used and displayed, will vary from culture to culture".

Sample 2: Paraphrase (Razi, 2011, p. 163)

Alderson (2000) indicates that the meaning of being literate, its appreciation, usage, and demonstration differs in relation with culture.

Sample 3: Summary (Razi, 2011, p. 164)

Alderson (2000) reveals that being literate differs in relation with culture.

In Sample 1, the expression is directly copied from the original source and readers can understand this since it is placed into double quotation marks. Also, in-text citation, namely author's surname, date of publication and page number, is provided so that readers can visit the references and find the relevant reference entry to learn the details of this publication. On the other hand, in Sample 2, this time the original expression is paraphrased, which means that the expression was restructured and the lexical items were changed with their synonyms, except for terminology. Although the sentence belongs to the author of this paraphrased expression, it should be noted that the idea is borrowed from someone else; therefore, we need to inform readers about this by adding in-text citation (author's surname and date of publication). Finally, in Sample 3, the expression again is presented like the paraphrased expression as in Sample 2 by restructuring and rewording it. However, this time the paraphrased expression is much shorter than the original one which is called as a summary. Again, we need to inform readers that the idea is coming from another source by adding in-text citation.

Quotations are considered to be long if there are 40 words or more. Such quotations are also called as block quotations since they are presented as a block. No quotation marks are needed for block quotations; however, all lines of the block are indented so that

readers can understand that the block is borrowed from another source. Here is an example of a long quotation:

According to MIT Academic integrity handbook for students (MIT, 2019, para. 3) common knowledge refers to:

- Information that [the average, educated reader would accept as reliable without having to look it up. This includes information that] most people know, such as that water freezes at ... [0] degrees [Celsius]...
- Information shared by a cultural or national group, such as the names of famous heroes or events in the nation's history that are remembered and celebrated.
- Knowledge shared by members of a certain field, such as the fact that the necessary condition for diffraction of radiation of wavelength from a crystalline solid is given by Bragg's law.

Different from legitimate ways of citing, **citation amnesia** refers to a type of misconduct that should be avoided. According to the sociologist Robert K. Merton (1973, pp. 47-48 as quoted in Palevitz, 1997, para. 5), "recognition of the worth of one's work by qualified peers is, in science, the basic form of reward (all other rewards deriving from it)". Omission of the citation of the relevant work of a researcher, intentional or not, is thus a type of research misconduct, and it may be even considered plagiarism, inasmuch as part of the work is reproduced without credit to the original researcher. Merton (1973) coined the expression "citation amnesia", while Eugene Garfield (1991), one of the founders of bibliometrics and scientometrics, spoke about "bibliographic neglect" and argued that it may result in unfair loss of priority of authorship, ultimately undermining the reward system of science. Besides undermining scientists' recognition, citation amnesia may have other unintended critical consequences. The studies in medical research and publishing suggest that omission of proper citations in reporting clinical trials may lead to ethically unjustifiable research, wasted resources, incorrect conclusions, and avoidable risks for the recruited research subjects (e.g. Robinson and Goodman, 2011). Moreover, despite the increasing use of electronic publishing, many journals still impose strict limitations on the number of references which might be included into a paper, thus contributing to (un)intentional bibliographic neglect. Readers and authors should be offered adequate opportunities for remediation as part of the post-publication peer review process, such as letter-to-the-editor sections. Scientists nonetheless maintain the main responsibility, being authors themselves, referees for the work of their peers, as well as editors of scientific journals and books.

When it comes to **double creation**, there are some historical examples of it. For example, Charles Darwin shared credit with A. R. Wallace through a joint presentation at the Linnean Society in 1848 after he discovered through correspondence that they had both independently developed the same theory about natural selection (Linnean Society, n.d.). Genuine cases of double creation are not plagiarism or misconduct.

Further readings about MLA, Chicago and Harvard citation style

Purdue online writing lab. MLA formatting and style guide. Available at:
<https://owl.english.purdue.edu/owl/resource/747/01/> [8 March 2018]

The University of Sydney, University library. Your guide to Harvard style referencing. Available at: https://library.sydney.edu.au/subjects/downloads/citation/Harvard_Complete.pdf [8 March 2018]

Williams libraries. Chicago style – notes and bibliographic system. Available at: <https://libguides.williams.edu/citing/chicago-notes> [8 March 2018]

Williams libraries. Chicago style – author-date system. Available at: <https://libguides.williams.edu/citing/chicago-author-date> [8 March 2018]

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American Psychological Association (2010). *Publication Manual of the American Psychological Association* (6th ed.). Washington, DC. (cited as APA)

Garfield, E. (1991). Bibliographic negligence: a serious transgression. *The Scientist*, 5(23): 14.

IEEE (2018). How to Cite References: IEEE Documentation Style. Available at: <https://iee-dataport.org/sites/default/files/analysis/27/IEEE%20Citation%20Guidelines.pdf> [8 March 2018].

Linnean Society of London: History of Science. Available at: <https://www.linnean.org/learning/lifelong-learning/history-of-science> [26 April 2018] (cited as Linnean Society)

Merton, R.K. (1973). *The sociology of science: Theoretical and empirical investigations*. University of Chicago Press.

MIT (2019). *Academic integrity at MIT: a handbook for students*, ed. Anna Babbi Klein. Massachusetts Institute of Technology (first publication date: 2005; updated: 2019). Available at: <https://integrity.mit.edu/sites/default/files/images/AcademicIntegrityHandbook2019-gray.pdf> [15 September 2019]

Monash University library (2018). Citing and referencing: Vancouver. Available at: <http://guides.lib.monash.edu/citing-referencing/vancouver> [8 March 2018].

Palevitz, B. The Ethics of Citation: A Matter of Science's Family Values. *The Scientist*, June 1997. Available at: <https://www.the-scientist.com/?articles.view/articleNo/18488/title/The-Ethics-Of-Citation--A-Matter-Of-Science-s-Family-Values/> [25 May 2018]

Razi, S. (2011). *Advanced reading and writing skills in ELT: APA style handbook*. Ankara: Nobel.

Robinson, K.A., Goodman, S.N. (2011). A systematic examination of the citation of prior research in reports of randomized, controlled trials. *Annals of Internal Medicine*, 154(1): 50-55. doi: 10.7326/0003-4819-154-1-201101040-00007

University of Louisville (2018). What is the difference between quotation, paraphrase and summary? Available at: <https://louisville.edu/writingcenter/for-students-1/common-writing-questions-1/what-is-the-difference-between-quotation-paraphrase-and-summary> [18 March 2018]

University of Manchester (2018). Academic Phrasebank: Available at: <http://www.phrasebank.manchester.ac.uk/introducing-work/> [11 March 2018]

Word and Phrase.Info (2018). Available at: <https://www.wordandphrase.info/> [11 March 2018]

Referencing is required for any written work that uses ideas or facts derived from other sources or authors. Either paraphrasing, summarising or quotation can be used, reference to the source must be provided (in the text and at the end of the work as a full list of sources referred to, or references). There are two main functions of referencing: *“they ensure that credit is given to the people and organizations whose previous works have contributed to that research, and they enable readers to uniquely identify and locate the original work or data and the source the materials used”* (National Information Standards Organization, 2010 as cited in Przybysz, 2012, para. 1).

Referencing internet-based sources without using persistent identifiers and using only URLs as links may lead to inability to access the source. This is called a 404 error (**invalid source**) and could happen when citing websites, blogs or publishers’ products which ceased publication or have been relocated.

A particular case of the 404 error is the citation of a non-existent source. This could be a reference which is a 100% invented and a type of falsification. A non-existent source is called a phantom publication. It could be that an author announced a forthcoming work, in a conference presentation, but was prevented from publishing it. Sometimes these kinds of works appear in library catalogues because of pre-ordering and early advertising of publishing houses.

Example:

Financial Times Deutschland, 2005: Kein Einlenken im K-Streit. <http://ftd.de/pw/de/24441.html> [accessed on 30.09.2005].

The URL <http://ftd.de/pw/de/24441.html> was referring to the German language edition of the newspaper Financial Times. This newspaper ceased publication in 2012 and the website doesn't exist anymore. Therefore, it is impossible for the reader to access the cited article (Franzky and Krämer, 2017).

Using persistent identifiers like digital object identifier (DOI) or Handle system (handle) provides a solution for this problem. Providing screenshots within an appendix would be the second-best option.

DOIs (DOI, 2016) originated in text publishing; however, the DOI system currently functions as generic framework for managing identification of wide range of formats of content and types of information sources (including journal articles, reports, sets of research data, videos, images, etc.). A DOI is a string divided into two parts, separated by a slash. The first part identifies the registrant (for example an organization or journal); the second part (chosen by the registrant) identifies a specific object (e.g. data set, journal paper). An example of DOI is doi: 10.1007/s40979-018-0027-8. DOIs may also be expressed as Uniform Resource Locators (URLs), such as <https://doi.org/10.1007/s40979-018-0027-8>

The Handle System (IETF, 2003) is a proprietary registry of the Corporation for National Research Initiatives, very similar to DOI (actually, DOI is a type of handle). It assigns persistent identifiers (handles) to information resources. An example of a handle is 20.1000/182, which may also be expressed as URL, such as <http://hdl.handle.net/10.1000/182>.

Irresponsible source use can be defined as an error due to negligent academic writing practice related to the misuse of published or unpublished materials. While it can be empirically asserted what is wrong with erroneous source use, the assessment of such an error as negligent source use is a matter of interpretation. The error could be a genuine mistake in writing or misinterpretation of the source used. In this case it is up to the community of the field of study to decide if the use of a source is considered as a simple mistake or as an act of wilfully misusing a source or as an acceptable view on the subject.

On the other hand, there could be an error with citing the sources. Some typical citation errors are common indicators of negligent citation or poor academic writing practice. Sometimes it is just a case of inattention. However, in some cases it is difficult or impossible to identify the original source. Depending on the context, negligent citation practices can nourish the suspicion that there is an issue of plagiarism.

Honest error results from negligence, not wilful (or malicious) misbehaviour; however, it can be difficult to distinguish from intentional misbehaviour. To describe a mistake in academic writing as unintentional (accidental, involuntary) or an honest error is an interpretation of that error. As a typical example, a spelling mistake within an author's name, e.g. Meyers instead of Myers, makes it almost impossible to detect the original source. However, the in-text-citation and the reference are present; therefore, we probably assume that it is just a mistake because we cannot see any attempt to hide unethical behaviour. On the other hand, using a complete paragraph verbatim including spelling errors from another work without referencing that work gives the impression that this was done by purpose. Nevertheless, the type and number of mistakes found in the text, as well as the specific context, can be used to inform the assessment of whether these are intentional or unintentional errors. Of course, mistakes identified as unintentional will reduce the quality of the work. The use of reference management software is recommended to mitigate this risk. An exhaustive list of such software tools is available in Wikipedia (Comparison of reference management software, n.d.).

In some cases, a list of sources at the end of a written work is provided in the form of **bibliography**. The list of **references** provides all the sources that were cited (referred to) in a text whereas a bibliography may also include other sources that were significant for the production of this work (though not directly used (cited) in the text). The decision whether to use reference list or bibliography is linked to a referencing style. For example, APA style does not use bibliography and requires providing a list of references (APA style, n.d.).

There are different styles for how to reference and how to compose references (they can vary between publishers, scientific disciplines or institutions). However, it is important to consistently use *only one* referencing (citation) style in a single written work. There are several internationally **recognised** (standard) **referencing** (citation) **styles**, such as:

- APA style (American Psychological Association) for psychology and other social sciences;
- MLA style (Modern Language Association) for literature, arts, and humanities;
- Chicago style:
 - notes and bibliography system for history, arts, and humanities;
 - author-date system for sciences and social sciences.
- Vancouver style (Biological Sciences);
- IEEE (Institute of Electrical and Electronics Engineers) citation style for computer science, electrical and electronics engineering;
- Harvard style for humanities and social sciences;
- as well as other standard referencing styles (Murray and Hughes, 2008; Research Management, n.d.).

Parenthetical citations styles usually minimize the information to cite the source in the text and provide related details at the end of the paper under the subtitle of “References” whereas other styles may encourage the use of footnotes on the related page regarding the cited source. Although there are stylistic differences regarding the documentation of reference entries, any of these styles encourage accuracy and completeness of reference entries, which enable readers to trace the sources listed.

ENAI Recommendation

Publishers of scientific journals usually provide either a list of preferred recognised referencing styles or a clear instruction if they use a specific referencing style (e.g. Elsevier indicates that their journals currently follow 10 standard styles; however, there are about 300 Elsevier titles (journals) that follow their own non-standard referencing styles (Przybysz, 2012)).

It is also important that education institutions provide clear guidelines for researchers and students about use of referencing styles for internal use (e.g., preparation of PhD theses): either indicate preferred recognised referencing style(s) or provide clear guidelines if a non-standard referencing style is used in the institution.

To help authors to deal with referencing in a more efficient and rigorous way, some good automated reference management tools (software) have been developed, such as Endnote, CiteULike, Mendeley, Zotero, RefWorks.

Further reading

American Psychological Association (2010). Publication manual of the American Psychological Association (6th ed.). Washington, DC: American Psychological Association.

Chicago style – author-date system. Williams libraries. Available at: <https://libguides.williams.edu/citing/chicago-author-date> [8 March 2018]

Chicago style – notes and bibliographic system. Williams libraries. Available at: <https://libguides.williams.edu/citing/chicago-notes> [8 March 2018]

CiteULike home page. Available at: <http://www.citeulike.org/> [8 March 2018]

Citing and referencing: Vancouver. Monash University library. Available at: <http://guides.lib.monash.edu/citing-referencing/vancouver> [8 March 2018]

Endnote home page. Available at: <http://endnote.com/> [8 March 2018]

IEEE (n.d.). *How to Cite References: IEEE Documentation Style*. Available at: <https://iee-dataport.org/sites/default/files/analysis/27/IEEE%20Citation%20Guidelines.pdf> [8 March 2018]

Mendeley home page. Available at: <https://www.mendeley.com/> [8 March 2018]

MLA formatting and style guide. Purdue online writing lab. Available at <https://owl.english.purdue.edu/owl/resource/747/01/> [8 March 2018].

RefWorks home page. Available at: <https://www.refworks.com/refworks2/default.aspx?r=authentication::init> [8 March 2018]

Your guide to Harvard style referencing. The University of Sydney, University library. Available at: https://library.sydney.edu.au/subjects/downloads/citation/Harvard_Complete.pdf [8 March 2018]

Zotero home page. Available at: <https://www.zotero.org/> [8 March 2018]

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APA Style (n.d.). How do you format a bibliography in APA Style®? Available at: <https://apastyle.apa.org/learn/faqs/format-bibliography> [15 February 2018]

Comparison of reference management software (n.d.). In: Wikipedia. Available at: https://en.wikipedia.org/wiki/Comparison_of_reference_management_software [31 May 2018]

DOI (2016). DOI Handbook. Available at: <https://www.doi.org/hb.html> [31 May 2018]

Franzky, T., Krämer, S. (2017). *Fehlertypologie. Eine Typologie intertextueller Fehler inklusive typischer Beispiele*. Unpublished manuscript, Freiburg.

IETF (2003). RFC 3650: Handle System. Available at: <http://www.rfc-editor.org/rfc/rfc3650.txt> [31 May 2018]

Murray, N., Hughes, G. (2008). *Writing up your University Assignments and Research Projects*. Berkshire: Open University Press.

National Information Standards Organization (2010). *Bibliographic references*. Available at: https://groups.niso.org/apps/group_public/download.php/12969/Z39_29_2005_R2010.pdf [5 September 2019]

Przybysz, E. (2012). Reference formatting. Elsevier. Available at: <https://www.elsevier.com/editors-update/story/author-support/reference-formatting> [28 February 2018]

Research Management and Citation Tools at Harvard. Harvard Library. Available at: <https://guides.library.harvard.edu/cite/guides> [28 February 2018] (cited as Research Management)

Sollins, K., Masinter, L. (1994). *Request for Comments: 1737: Functional Requirements for Uniform Resource Names*. Available at: <https://tools.ietf.org/html/rfc1737> [31 May 2018]

PROOFREADING

Both students and researchers may require **proofreading** of their papers, especially those publishing/submitting papers in a language which is not their mother language.

Proof-readers may use electronic tools, such as Track changes and Comments in Microsoft Word or similar programmes, Notes in PDF documents, or proofreading symbols in paper documents defined by ISO 5776 (2016).

ENAI Recommendation

At institutional level, clear instructions should be provided about what kind of input is allowed from the proof-reader. It is suggested that a proof-reader corrects grammatical and typing errors only and does not change the content. Proof-readers can mark passages that are difficult to understand or requiring better wording. They should not suggest the wording or change it in the paper.

Further reading on ethical issues of proofreading

Harwood, N., Austin, L., Macaulay, R. (2010). Ethics and integrity in proofreading: Findings from an interview-based study. *English for Specific Purposes*, 29(1): 54-67.

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ISO 5776: 2016. *Graphic technology -- Symbols for text proof correction*. Available at: <https://www.iso.org/standard/61838.html> [19 September 2018]

“**Peer review** in scholarly publishing is the process by which research output is subjected to scrutiny and critical assessment by individuals who are experts in those areas” (Hames, 2012, p. 16). Such a process aims at enhancement of quality and soundness of scientific work submitted for evaluation by providing constructive feedback from experts, or, in other words, peer reviewers. The theoretical roots of peer feedback date back to Bruner’s (1978) ‘scaffolding’ and Vygotsky’s (1978) Zone of Proximal Development. Peer review is primarily linked to scholarly publishing as journals rely on the peer review process to ensure quality and validity of articles submitted for publication in the journals (Elsevier, n.d.). In this way, publishers can encourage their prospective authors to make improvements to their manuscripts by calling attention to the gaps and errors in the earlier versions. Such a process can be illustrated as a dialogue between the editor, the reviewers, and the corresponding author and also makes significant contribution to the decisions taken by editors on the acceptance or rejection of submissions. The peer review process “provides authors with an opportunity to improve the quality and clarity of their manuscripts”; it is also useful for reviewers, “as it helps them develop knowledge and expertise in their specific field” (Ali and Watkinson, 2016, pp. 194-195). Apart from publication purposes, peer review is also used to evaluate research projects, grant proposals and other scientific works.

There are several types of peer review process. Depending on whether identities of author and reviewer are revealed to each party there can be open peer review (both identities revealed) and blind peer review (identities not revealed).

Blind peer review is also referred as “anonymous review” or “masked review” (Largent and Snodgrass, 2016). The aim of managing the peer review process anonymously is keeping the rights of both authors and reviewers by encouraging reviewers to introduce their actual criticism of the paper without having any bias towards the author of the paper. It is important to note that before accepting to review a manuscript, reviewers should consider the likelihood of any potential conflict of interest and inform the editor immediately if necessary.

Blind peer review presupposes impartiality of the review process. In the case of **single blind peer review** (author remains anonymous to reviewer), the reviewers are not influenced by authors; however, anonymity can also lead to unnecessarily critical or harsh comments about the authors’ work because reviewers are confident that the authors will not be able to identify them (Elsevier, n.d.). Double blind review (both parties remain anonymous) aims to improve the probability that submitted work will be evaluated based on its content and not on author-related factors. It prevents reviewer bias that could occur because of author’s country of origin, previous controversial work or vice versa, high prestige of the author (Elsevier, n.d.). By maintaining the process anonymously, on one hand, any possible bias that might be due to such factors is

reduced and reviewers are encouraged to focus only on the academic merits of the submission; on the other hand, a safe platform to criticize submissions is provided to reviewers, as prospective authors do not know their identities. However, it should be noted that some clues such as author's writing style and self-citations may disrupt anonymity and give some evidence to reviewers about the identity of the author which may then impact on the reviewer's objectivity when reviewing (Ali and Watson, 2016). **Triple blind peer review** introduces the anonymity of editors to both authors and reviewers. "This is aimed at minimizing bias among editors but does not eliminate the possibility of identifying authors by their work or of bias against competing work" (Watson, 2015, para. 9). Unfortunately, the relevant literature does not provide a consensus on the ideal way of managing the peer review process since little is known about how anonymity affects the process (Largent and Snodgrass, 2016).

Open peer review has two sides: some consider that it is a "way to prevent malicious comments, stop plagiarism, prevent reviewers from following their own agenda, and encourage open, honest reviewing", whereas others see it as "a less honest process, in which politeness or fear of retribution may cause a reviewer to withhold or tone down criticism" (Elsevier, n.d., para. 12). Some journals that apply open peer review also publish named review reports alongside the article (in such a cases, it is recommended that journal editors or publishers implement a policy requiring reviewers to sign a written agreement or rights transfer allowing publishers to make the report publicly available) (Hoke and Moylan, 2016).

Editors, publishers or other bodies who are responsible for an evaluation process choose the type of peer review process that is most suitable for their specific purposes. However, Hoke and Moylan (2016) stress that policies of peer review process must be clearly communicated to authors and reviewers in writing so that both parties can make informed decisions previous to submitting a manuscript (or other work) or agreeing to be a reviewer. Moreover, Hoke and Moylan (2016) propose several important issues that need to be considered: extent and duration of confidentiality requirements for authors and reviewers; whether the journal will publish the names of reviewers with the manuscript; policy on potential transfers of reviews of manuscripts that were rejected and may be later submitted elsewhere; a means for providing credit or acknowledgment to reviewers.

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Watson, R. Exploring the peer review process. In: *The Wiley Network*. Available at: <https://hub.wiley.com/community/exchanges/discover/blog/2015/09/22/exploring-the-peer-review-process> [7 March 2018]

What is peer review? Elsevier. Available at: <https://www.elsevier.com/reviewers/what-is-peer-review> [1 March 2018] (cited as Elsevier)

TEXT-MATCHING SOFTWARE

“**Text-matching software**” is sometimes mistakenly called “plagiarism detection software” or a “plagiarism checker”. Some researchers (e.g. Weber-Wulff, 2014) have been highlighting the problem that calling them “plagiarism detectors” misleads academia by suggesting that software can detect plagiarism itself, which is not true. Text-matching software produces similarity reports by checking the similarity of the submission against resources in their databases, which generally consist of internet sources, journal and conference papers, books, and student assignments. Similarity reports then highlight the similarities between the submission and any other sources in the databases (Vanacker, 2011). It is essential to note that not all similarities that are highlighted by text-matching software are due to plagiarism. Similarity reports should be carefully examined by humans (Carroll, 2009), ideally by academics from the relevant field, in order to decide whether there are any concerns about plagiarism. By highlighting the matches, text-matching software may facilitate the detection of plagiarism, nothing more. Unfortunately, statistical information retrieved from similarity reports is wrongly interpreted by some people to indicate the existence of plagiarism without the need for interpretation by academics. This is not a valid approach to finding plagiarism. Please note that there might be fully plagiarized documents with a very low similarity score (e.g. text-matching software finds a match in abstract only as the rest of the document is behind a pay wall, or the plagiarism is carefully disguised), as well as cases not constituting plagiarism with very high similarity score (e.g. comparing new version of the document with previous one). In the interpretation of similarity reports, extra attention should be given to similarity reports that have zero per-cent similarity, not matching with content in any other documents. Academic writing definitely requires the integration of other sources and such a practice (having zero similarity to other sources) does not fit with the aims of academic writing; therefore, such cases should be approached with caution as it is likely that the author has tried to obfuscate plagiarism or used one of the methods of technical disguise by manipulating the text (e.g. Meushke and Gipp, 2013).

Text-matching software finds similarities between documents in two steps (Ojsteršek et al., 2014). The first step is candidate retrieval, which identifies suspicious documents in the large set of documents. Various methods are used for candidate retrieval, as described in (e.g. Alzahrani et al., 2012; Meuschke and Gipp, 2013; Stein, 2007). Then, suspicious documents are examined carefully in the second step. Several algorithms exist for this task, as described in a survey article (Navarro, 2001). The result of the second step is a user-friendly presentation of passages in the examined document that match to passages in the suspicious documents.

The success of discovering similar documents depends on:

- *Conversion tools from pdf or other text formats to plain text* (some plagiarists know methods how to fool text-matching software);
- *Size of the corpus of documents used by the software* (if original document is not

in the database then the software is unable to find matches that will help detecting plagiarism), or its ability to retrieve online documents

- *Ability of the software to detect obfuscated plagiarism* (plagiarized document may be paraphrased, some words can be substituted by synonyms, etc.);
- *Ability of the software to detect cross-language plagiarism* (i.e. plagiarized document is machine or human translation of the original document);
- *Use of more detection methods like writing style comparison and citation analysis within the input document* (Gipp, 2013); and
- *Use of methods for ranking of similar documents* (Alzahrani et al., 2012).

Although technological advances help detecting verbatim plagiarism, in addition to lightly disguised plagiarism, it is not possible to merely depend on the capabilities of text-matching software in cases of heavily disguised plagiarism such as paraphrased, translated or idea plagiarism, which cannot be identified in similarity reports (Gipp, 2013). Debora Weber-Wulff and her collaborators have developed software tests for evaluation of text-matching software. Their conclusions are that “teachers should be educated in the use of text-matching software in order to discover plagiarism on their own” (Weber-Wulff et al., 2013, p. 16).

ENAI Recommendation

Universities should focus their effort more on plagiarism avoidance than on detection and penalties.

Institutions where English is not the only language may consider using several different text-matching software tools to make sure that all languages of the documents are thoroughly investigated.

There are two major problems that users of text-matching systems should be aware of:

1. It is possible for text matching systems to report high similarity scores for work that is original. This can happen when text includes many common phrases and the software finds a match with four or five words in sequence. This may be interpreted as being plagiarism unless the whole context of a sentence or a paragraph is taken into account. This could lead to possible unfair outcomes for a student who is facing an unjustified accusation of plagiarism.
2. In some cases, the software does not find any similarity (0 % similarity). This problem arises when sources of plagiarism are not in the database, if text conversion of input document failed or if the document has been manipulated to make the text invisible or not recognised by the software tools (e.g., use of homographs).

In addition to helping with the detection of plagiarism, using text-matching software tools as part of teaching can be an effective way to educate students about the process of academic writing, paraphrasing, referencing and using academic sources (Davis, 2009). Before students are allowed to submit their draft work to text-matching software, they

should be given support and guidance on how to interpret and effectively use the feedback from the tools to improve their writing. It should be noted that text-matching software provides a possible mechanism by which students can alter their text enough to evade detection of plagiarism.

Some institutions set an official threshold, which is used in sanctioning process (for example works with more than 30 per-cent of similar text are considered as plagiarised from other sources). This is not a good practice and should be avoided. There might be a threshold for flagging a suspicious document, but then every suspicious work has to be examined by an academic. It is suggested that more than one person, e.g. a panel, examines more severe cases, which might lead to severe penalties. Text-matching systems can only be considered to be tools, but not to be systems for automatic determination of plagiarism (Weber-Wulff et al., 2013).

Institutions should make sure that not only are students' submissions (assignments, final study works, and examination papers) checked for plagiarism, but also papers, technical reports, scientific reports, textbooks, coursework briefs and other documents produced by academics and other employees.

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REPRODUCTION | REPUBLICATION

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In some countries (e.g. Lithuania, Czechia, Portugal, Slovenia, Latvia) regulations on doctoral education require the candidate to publish a specified number of scientific papers relating to the doctoral dissertation; it is treated as published research results/findings of the doctoral dissertation. In such cases, re-using the scientific papers for the doctoral dissertation does not need any permission (doctoral dissertation is considered as a manuscript, not a published work), but they should be referred to in the doctoral dissertation. Also, it is recommended that the publisher and the editor-in-chief are informed in advance about any particular national rules that may exist.

Examples of permission forms and guidelines

Elsevier permission rules. Available at: <https://www.elsevier.com/authors/permission-request-form> [26 February 2018]

Printing, copying, and reproduction. Oxford University Press. Available at: <https://global.oup.com/academic/rights/music-rights/reproduction/?cc=lt&lang=en> [26 February 2018]

The Basics of Getting Permission. Stanford University Libraries. Available at: <https://fairuse.stanford.edu/overview/introduction/getting-permission/> [26 February 2018]

RETRACTION

There are two kinds of retractions. First, **retraction** can be initiated by a publisher or editor-in-chief often due to negligence in research (flaws in research), other evidenced misconduct or high suspicious of misconduct (so-called ‘publisher retraction’). In some cases, publishers provide public notes with a publication, such as ‘errata’ or ‘erratum’ that indicate corrections made by the publisher due to, for example, errors in formatting a manuscript. This is not a retraction, nor is it misconduct. Other corrections could be made by authors if the editor-in-chief allows this. Such corrections bear a note of ‘corrigendum’ or ‘corrigenda’. Again, this is not a retraction and not misconduct. Second, retraction can be initiated by an author if the author detects flaws in data analysis that invalidate the research results and conclusions or any other serious reason that makes the publication inaccurate or misleading (so-called ‘self-retraction’). This is an example of research self-regulation while the paper explicitly shows unintentional error.

The most influential blog that reports on retractions of scientific papers and related topics is Retraction Watch.

Examples of guidelines related to retraction

Retractions – when to retract. Springer. Available at: <https://www.springer.com/gp/authors-editors/authorandreviewertutorials/biomed-central-editor-tutorials/post-publication-issues/retractions-when-to-retract> [26 February 2018]

Retractions – how to retract. Springer. Available at: <https://www.springer.com/gp/authors-editors/authorandreviewertutorials/biomed-central-editor-tutorials/post-publication-issues/retractions-how-to-retract> [26 February 2018]

Further reading

Retraction Watch. Blog. Available at: <https://retractionwatch.com/> [4 June 2018]

Guidelines about Academic Integrity Breaches

ACADEMIC DISHONESTY | ACADEMIC FRAUD | ACADEMIC MISCONDUCT | DISCIPLINARY MISDEMEANOUR

Academic dishonesty can be present in a variety of forms (including but not exclusive to):

- Cheating in assignments or publications (e.g. plagiarism, ghost-writing, falsifying/fabricating references, multiple submissions, fake authorship);
- Cheating in exams (e.g. crib notes, copying, using disallowed tools, impersonation);
- Cheating in projects (e.g. collusion, contract cheating);
- Selling assignments (e.g. essay mills);
- Cheating in research (e.g. data fabrication, data falsification, misinterpretation);
- Financial fraud (related to research project, travel documents, etc.);
- Bribery;
- Falsification of documents;
- Improper behaviour (e.g. mobbing, bullying, sexual harassment);
- Improper use of computers, laboratories, or other equipment;
- Sabotage, conspiracy.

The term academic dishonesty applies to all academic disciplines and all levels within academia, although some of its forms are more usually linked to student assessments. In fact, any behaviour that is focussed on improperly advancing and/or diminishing the academic status of individuals (and those who try to protect these individuals) comes under this definition. The terms academic dishonesty, **academic misconduct**, **disciplinary misdemeanour** and cheating appear to be used interchangeably throughout the literature.

ENAI Recommendation

To discourage academic dishonesty of students, it is recommended that academics ensure equitable conditions for all students to avoid favouritism or other potential malpractices. Also, students should receive a clear explanation of what is allowed during examinations, assignments and projects and should be aware of sanctions that will be applied when these rules are not obeyed.

In terms of administration and financial management of externally funded research projects, at each institution, a legally binding document, clearly describing the border between acceptable and unacceptable conduct, should be adopted and made publicly available. Project administrators, project managers and other staff should be trained regularly to prevent unintentional behaviour. Moreover, an ethical code should be adopted and generally made known among staff. Ethical codes should promote honest behaviour, going beyond requirements of legally binding documents.

Further reading

Colnerud, G., Rosander, M. (2009). Academic dishonesty, ethical norms and learning. *Assessment and Evaluation in Higher Education*, 34(5): 505-517. <http://dx.doi.org/10.1080/02602930802155263>

Dunbar, G. (2009). Managing academic dishonesty. *Psychology Teaching*, November 2009. Available at: www.heacademy.ac.uk/system/files/managing-academic-dishonesty.pdf [11 March 2018]

Mazar, N., Ariely, D. (2006). Dishonesty in everyday life and its policy implications. Working paper series. Federal Reserve Bank of Boston, No. 06-3. Available at: <https://www.econstor.eu/bitstream/10419/55638/1/508635004.pdf> [11 March 2018]

Rujoiu, O., Rujoiu, V. (2014). Academic Dishonesty and Workplace Dishonesty. An Overview. In: *Proceedings of the 8th International Management Conference Management Challenges for Sustainable Development*, November 6th-7th, 2014, Bucharest, Romania. P. 928-938. Available at: <http://conferinta.management.ase.ro/archives/2014/pdf/91.pdf> [11 March 2018]

There are many different kinds of **corruption**, for example financial corruption, corruption in research. The categories of corruption described in the Transparency International glossary distinguish between Grand (high level abuse of power), Political (misuse of resources, abuse of legislation, undue influence in governmental decisions) and Petty (everyday, small-scale) corruption. Corruption in higher education can occur at all three of these levels (Transparency International, n.d.). Corruption does not need to involve money. The advantage or gain could be in many different forms, for example: services, appointments, reciprocal or mutual benefits, sexual or other favours.

Mismanagement of research funds may take diverse forms, particularly in research project management (e.g. “using grant funds allocated for equipment to pay for travel to a conference” (Resnik, 2015), or to use research funding to purchase equipment not required for the funded research). Some practices related to financial mismanagement may also be classified as fraud or embezzlement (Resnik, 2015).

ENAI Recommendation

To deal with this type of malpractice, all expenditure should be supported by adequate records as required by research funding organisations and by the organisation responsible for managing the research. Oversight should be provided in the form of regular financial and performance audits. Clauses related to mismanagement of research funds and related consequences are usually included in research funding agreements.

In terms of fiduciary responsibility, officials must account for the money and/or property entrusted to them. All forms of cheating, stealing, misappropriate use of institutional resources, or circumvention of institutional financial policies should be considered inappropriate within the academic community. Officials must not accept compensation, gifts, or other special consideration in return for the promise of institutional business; the borders of acceptable behaviour should be clearly stated in a professional code of conduct and/or ethical code.

Regular training should be provided for all staff involved in financial operations in order to prevent unintentional breaches and to provide clarification of what is acceptable and unacceptable conduct.

Examples of anti-bribery management systems

ISO 37001:2016 – Anti-bribery management systems -- Requirements with guidance for use. Available at: <https://www.iso.org/standard/65034.html> [2 May 2018]

Further reading

Academy of Management Code of Ethics. Available at:

http://aom.org/uploadedFiles/About_AOM/Governance/AOM_Code_of_Ethics.pdf [12 March 2018]

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Anti-Corruption Glossary. Transparency International. Available at:

<https://www.transparency.org/glossary> [26 April 2018] (cited as Transparency International)

Resnik, D.B. (2015). *Glossary of Commonly Used Terms in Research Ethics*. National Institute of Environmental Health Science, National Institutes of Health, May 2015. Available at:

<https://www.niehs.nih.gov/research/resources/bioethics/glossary/index.cfm#a750742> [24 February 2018]

PLAGIARISM

There are many types of plagiarism and ways of classifying them. Maurer et al. (2006) identify four broad categories of plagiarism:

- **Accidental:** happens when an author lacks knowledge and understanding of how to acknowledge sources.
- **Intentional:** a deliberate act of copying all or part of another work without appropriately crediting the original source.
- **Unintentional:** an author unknowingly uses material that is similar or identical to that previously published by another author, claiming it to be original.
- **Self-plagiarism:** using author's own previously published work or its part without referring to the original piece of work.

(adapted from Maurer et al., 2006, p. 1051)

There is a long list of plagiarism practices commonly used. Some of these methods include (Maurer et al., 2006; Weber-Wulff et al., 2013; Plagiarism.org, 2018):

- **Copy & paste** (see also clone plagiarism): copying textual contents (either from printed source or, online document or a web page) word from word without acknowledgment of original source.
- **Patchwriting** (also called remix, mashup or mosaic plagiarism): usage of passages from different sources and compiling them together without acknowledgment of the original source. This possibly includes minor changes (synonym replacement, grammatical restructuring).
- **Boilerplate plagiarism** (also so-called template or structural plagiarism): using a template material (for example template introduction, conclusion, structure of the work, footnotes, etc.) or language, possibly with minor changes without acknowledgment of the original source. Even though boilerplate may be a valid way to learn language, in academic papers is unacceptable.
- **Paraphrasing:** changing grammar, substituting words with similar meaning, re-ordering sentences or restating the same content in different words without acknowledgment of the original source.
- **Translation plagiarism:** content that has been translated from the original language into a second language and re-used without acknowledgement of the original author.
- **Improper use of quotation marks:** although the original source is referenced, the author fails to accurately identify the start and the end of the content that has been borrowed.
- **Idea plagiarism:** using an idea, concept, opinion or chain of arguments, that came from another author without acknowledgement. Unless the idea can be classified as common knowledge, re-use of the idea needs to be attributed to the original author.

- **Invalid source:** details provided about a source, in the in-text citation or reference, are incomplete, inaccurate, or the source does not exist. For example: the writer provides the author's name for a source but neglects to include specific information on the name of the journal or publication making it impossible to locate the source.

Some literature also includes "The Resourceful Citer" as a type of plagiarism. "The resourceful citer" means that the writer properly cites all sources, paraphrasing and using quotations appropriately. The problem is that the paper contains almost no original contribution and therefore author does not deserve any credit for the work. It is necessary to distinguish this case from the others because technically such an assignment is not plagiarism, but failure to demonstrate personal achievement of learning outcomes.

Plagiarism does not refer to copying of text only. Therefore we distinguish also:

- **Artistic plagiarism** (see also **image plagiarism** and **multimedia plagiarism**): using someone else's non-textual work, such as images, voice or video. The writer needs to cite and to have the author's permission for using such material, except use cases explicitly permitted by authorship laws or attached copyright.
- **Code plagiarism:** "using program code, algorithms, classes, or functions without permission or referencing" (Maurer et al., 2006, p. 1052).

Usually plagiarists obtain some benefit, credit, or gain, which need not be monetary. It generates an unfair advantage and, in most cases, violates copyright legislation (Fishman, 2009). Plagiarism must be strictly avoided, as it "constitutes a considerable harm in most educational contexts" (Vanacker, 2011, p. 327).

When an author re-uses their own work, this may or may not be considered acceptable, it depends on the context and the content copied. Some authors argue that using their previous data is essential to form the basis for the new research and provide other reasons to re-use their own work (Burton, 2014; Horbach and Halffman, 2017). In general, any reuse is acceptable only if the original source is properly cited.

ENAI Recommendation

In most cases, it is possible to avoid plagiarism by appropriately citing sources. Anything copied from another source should be quoted and cited accordingly and all other writing should be as original as possible. It is important to make a "proper acknowledgement" (East, 2005).

To prevent plagiarism, each academic institution must make sure that students develop their academic writing skills. Therefore, extensive training should be provided to all students at an appropriate time, before the students are required to write their first assignment. Students should be equipped with educational materials providing explanation and examples relevant to their field of study. It is recommended that

development of academic writing skills is embedded throughout whole educational cycle.

Academic staff should also be trained in order to provide high-quality guidance to students, to be able to explain the purpose of academic writing and to motivate students to write their own assignments. As plagiarism is not just limited to students, researchers should also receive appropriate training to make sure they avoid plagiarism in their scientific publications.

Many materials on this topic are available through the ENAI portal, which are ready to use for training of students and staff.

It is highly recommended that every institution use text-matching software. Using such tools should be required by institutional policy for checking appropriate types of assessment. The policy should also define the surrounding procedures; especially the process to be followed if an allegation of plagiarism is made. It is important to emphasize, that the similarity measure presented by text-matching software, usually in the form of a percentage, does not say anything about the extent of plagiarism. There may be cases of serious plagiarism with a low percentage of directly matching text (e.g. in case of paraphrase plagiarism). On the other hand, there may be high similarity with a previous version of the same piece of work previously submitted to the system. Therefore, supervisors should always check the similarity report carefully and use their own judgement. The final decision about plagiarism has to be always done by academic judgement and not by text-matching software. Some institutions tend to determine plagiarism based solely on the percentage provided by text-matching software. This approach is inappropriate because it can lead to both false positives and false negatives.

Assessing plagiarism in academic works and deciding the outcomes should be based on (Wager, 2014):

- Extent (varying from few words to whole paper);
- Originality of copied material (varying from common knowledge to original idea);
- Position/context of material (distinguishing method and findings);
- Referencing of copied material;
- Intention to deceive copy;
- Author seniority and previous writing experience (typically varying from undergraduate student to senior researcher).

Plagiarism can be classified according to the level of seriousness of the offence. Examples of minor and major offences have been summarized based on extracts from “Rutgers University academic integrity policy” (Rutgers University, 2018), from “Regulations for academic integrity at the University of Latvia” (University of Latvia, 2013) and from “Statute of University of Maribor” (University of Maribor, 2012).

Examples of minor offences are:

- Improper citation without dishonest intent;
- Plagiarism on a minor assignment or a very limited portion of a major

- assignment;
- Unauthorized collaboration with another student on a minor homework assignment;
- Citing a source that one hasn't read on a minor assignment;
- "Accidental" or "unintentional" plagiarism of a survey part or research methodology of a work.

Major offences are very serious violations of academic integrity. Some examples of major offences are:

- Substantial plagiarism on a major assignment;
- Plagiarism of an essential part of the work programme (e.g. hypothesis of final thesis, stealing of research ideas, research results, conclusions) and other written assignments;
- Multiple minor offences.

The recommendation for outcomes at each level depends on the habits in a particular academic community. For both minor and major offences, the severity of the outcome imposed should be proportional to the severity of the offences committed. Sanctions for a given offence may vary depending on the student's experience in academic writing (Rutgers University, 2018). Within this perspective, sanctions for the violations of academic integrity will probably be harsher for those who pursue post-graduate degrees. However, this rule does depend on the background of the student. A graduate student may not have experienced the need for referencing in academic writing if they have previously studied in a different institution, perhaps in a different educational system or country. Such students will need time to "acclimatise" and adjust to the expectations in their new institution.

ENAI recommends that outcomes for minor offences emphasize further learning. Therefore, warning, guidance, re-submission of work or taking an extra course of academic writing is appropriate. Outcomes of major and/or intentional offences may have a more serious form of punishment including suspension or expulsion. In both cases, outcomes should be applied consistently, transparently and fairly. Workflow of handling plagiarism cases should be clearly described in institutional policy.

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DIPLOMA MILL

The existence of **diploma mills** (so-called fabrication or falsification of educational degrees, certificates, diplomas and transcripts) leads to lack of trust in university diplomas by society and undermines trust in academia as a whole. In most countries, only legitimate higher education institutions are eligible to issue diplomas (e.g. The Higher Education Act of the Czech Republic). Therefore, issuing diplomas from non-authorised universities, or even issuing fake diplomas, may be considered a criminal offence.

Diploma mills may be companies that provide a service to issue fake academic documentation. Alternatively they may be bogus colleges and universities that pretend to offer educational programmes, but in practice do not provide tuition or require attendance. These organisations can be based anywhere in the world and can apply at any level of education (AACRAO, 2006; CHEA / UNESCO, 2009; Cohen and Winch, 2011; Daniel, 2018).

The Groningen Declaration Network was formed in 2015 based on the terms of Groningen Declaration (2015), in response to the need for companies and educational institutions to verify qualifications of applicants for work and study, both domestically and internationally (GDN, n.d.). Its members offer reciprocal services based on access to depositories of legitimate digital qualifications, using a range of models, from data repositories to block-chain technology (for example HEDD UK, CHESICC China, Parchment USA, ENIC / NARIC Global).

The intended user of the services varies with the organisation (e.g. student, refugee, potential employer, HE provider), but the ultimate goal of all the GDN organisations is to provide secure access to confirm valid digitally based credentials (Daniel, 2018).

ENAI Recommendation

Students should be informed about the phenomenon of diploma mills so they are aware of this issue in their future career. Recruiters from all types of organisations should double check the information provided in CVs and check not only the existence of the diploma for a particular degree, but also its credibility.

Example of a diploma mill

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FABRICATION | FALSIFICATION | DATA FALSIFICATION | DATA FABRICATION | DATA IMPUTATION | DATA SUPPRESSION | FABRICATION, FALSIFICATION AND PLAGIARISM (FFP)

Typically terms “fabrication” and “falsification” include the manipulation of results (data or evidence) in order to have a benefit (career, funding, commercial gain). In some cases, they are induced by the sponsor of the research (e.g. sometimes in biomedical research this occurs with pharmaceutical industries).

In academic institutions it is possible to find falsification of many different types and fabrication of scientific papers (CSAIL, 2005; Labbé and Labbé 2013; Van Noorden, 2014). Some examples are falsification of approval from teacher to pass an experimental or practical part of a course, signatures, student ID, student records, employment records, employment CV, contracts, financial records and expenses for a project.

Fabrication, falsification and plagiarism (referred to as FFP) are considered to be the core of research misconduct (IAC/IAP, 2012; OECD, 2007; Science Europe, 2015). IAC/IAP Policy Report highlights that in many countries and contexts such practices as FFP are regarded as being egregious and receive significant sanctions. Misconduct like FFP “damages the scientific enterprise, is a misuse of public funds, and undermines the trust of citizens in science and in government” (OECD, 2007, p. 1).

Data imputation is a process of replacing missing or lost data with substitute values. If done honestly and transparently, data imputation is not considered to be a data fabrication (Resnik, 2015); it is considered a legitimate way to deal with missing or apparently erroneous values. However, some academics deliberately exclude or invent data values in their datasets in order to obtain research results that confirm their hypotheses. Justifiable imputation must rely on scientifically reasoned methods, such as statistical methods applied for handling of missing data (Allison, 2009).

As reviewed by Kumar (2008), particularly in the biomedical field, **data falsification** occurs in different ways as for example with **data suppression**, by removing some experiments and related results from the final data sheet that are not corresponding to the initial aim (e.g. efficacy/safety of a new drug). Data suppression includes removal of outliers in order to minimize the standard error and increase the P value of the data. Of course, this behaviour is not limited to the biomedical field, it can also happen in many other fields, including psychology and sociology.

Data falsification includes the manipulation of images obtained from microscopes, telescopes, radiology and other techniques that can be manipulated with specific software. As pointed out by Couzin (2006), the issue of data fabrication in a paper submitted to a journal for publication is not so easy to discover because “peer review cannot detect [fraud] if it is artfully done” (as stated by Donald Kennedy, the former editor-in-chief at *Science*) (Couzin, 2006, p. 23). However, some organisations and publishers provide excellent information to the reviewers to identify or recognize this fraudulent conduct, (e.g. Springer, COPE).

ENAI Recommendation

As reported by Baerlocher et al. (2010) it is necessary to make efforts in order to minimize "human error through data reliability safeguards" (p. 40) so that "only true values [will be] recorded, analysed, and presented" (p. 40). Data reliability safeguards should regard all the data management process, from data collection and storage, through retention and analysis until sharing and reporting. It is the responsibility of the principal investigator as well as of all the research team to properly address in advance any issues related to data management.

Study data should be available and researchers should be ready to release their datasets. An increasing number of scientific journals have developed specific policies for data analysis and posting in easily accessible places. Several community-recognized public data repositories are available on the web, either generalist or discipline-specific. The ICMJE includes among criteria for authorship assignment that authors agree "to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved" (ICMJE, 2018, para. 3). This definition clearly implies accountability for all study data, as well as for their analysis and interpretation.

This approach aims to discourage the practice of data fabrication and falsification on the basis that, if the data is made accessible, then any data manipulation can be identified and corrected. Some valid scientific and statistical methods can be used to minimize potential manipulation of data and presentation of falsified or fabricated data.

One of the common ways to deal with missing data is imputation, which can be categorised further as: hot deck and cold deck imputation; listwise and pairwise deletion; mean imputation; regression imputation; last observation carried forward; stochastic imputation; and multiple imputation (UNESCO UIS Glossary, n.d.).

Example of available guidelines about fabrication and falsification of data

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CHEATING | COLLUSION | UNAUTHORIZED AID | CRIB NOTES

It is important to recognise that the term “cheating” is defined differently in academic contexts than in common law, where **cheating** is classified as a non-indictable offence. By legislation, cheating is defined as a specific criminal offence (usually relating to property). However, in academia, the term “cheating” refers to the practice of gaining unfair or unearned advantage. The term is commonly used in different fields, such as business, academia, or in day-to-day life. As a verb, it can be used with different connotations including adultery, dishonesty, betrayal, breach of trust, deception, embezzlement, infidelity, ignoring ethics, false pretences, lying etc. In scholastic usage, the verb usually suggests academic cheating (so-called academic dishonesty). Academic cheating either has a moral element, an urge for an achievement dimension, or both. These are reinforced by the opportunity to cheat. Academic cheating seriously affects the rigour of the assessment practices, which ultimately jeopardise students’ trust in academic evaluations.

Collusion occurs when two or more individuals enter into an often-undisclosed agreement, to cheat and/or gain an unfair advantage over a third party. Sometimes individuals are expected to work collaboratively. Team projects are an essential part of the learning process. However, that does not allow them copying one another with or without consent. Individuals can also write collaboratively (e.g. writing different chapters of a book). Presenting group work without properly acknowledging the co-workers with or without their agreement is cheating. Note that in collusion cases, both parties are culpable for the offence, unless the individual who submitted the work used materials from another party without consent.

Unauthorised aids can include inappropriate use of crib notes, communications with an accomplice, colleague, friend or family member during closed-book/formal examinations, use of ghost-writers (via contract cheating companies, colleagues, friends or family members) to complete written assignment or project, use of an impersonator to take a test or examination, use of smart devices and technology to communicate with other people during formal examinations or using on-line resources during a formal examination.

Crib notes (or cheat sheets) are usually disallowed as an aid during written exams. However, as higher education emphasises the application of acquired knowledge (rather than memorisation and reproduction), many universities are now allowing students to bring their own (short) notes or other material to the examination. This form of assessment is known as an open-book test or examination, in which the questions require knowledge application rather than reproduction. A clear definition of what is allowed during an examination should be provided in advance for students.

According to Donald McCabe, “*one of the most common rationales that students offer for cheating is the question of fairness. Students who claim they normally do not cheat feel they have no choice when a faculty member makes little or no effort to prevent or respond*

to cheating” (McCabe, 2005, p. 9). McCabe and Pavela remind us that *“Faculty members who ignore or trivialize academic dishonesty send the message that the core values of academic life aren’t worth enforcing”* (McCabe and Pavela, 2004, p. 15)

ENAI Recommendation

In student assignments, it should be clearly specified whether individual work or team-work is expected. Guidelines for each type of project should be provided to students. In the case of individual work, it should be clearly stated to what extent someone else’s input is permitted (e.g. proofreading). In the case of team-work, either the sub-tasks should be clearly divided, or students should be required to declare how and what each member of the team contributed, for example by giving percentages of each other’s contribution. In some cases, the responsibility for division of labour can be transferred to the group or its leader. Students should be given the opportunity to discuss these issues with the teacher/supervisor. The teacher may require proof that all students in a team work really participated on the project. This may be in the form of a short video filmed during the project sessions.

To limit students’ cheating in formal written examinations through use of unauthorised aids (e.g. smartphones, crib notes, hidden cameras and earpieces, smart watches) and communicating with people other than the supervisors, inside or outside the examination room, these measures should be adopted across the institution (Foltýnek et al., 2017):

- Examination questions should focus on students’ ability to solve a problem or apply knowledge, skills and techniques, rather than memorizing particular pieces of information
- Rigorous supervision/proctoring/monitoring should be provided throughout the examination by qualified and trained personnel
- There should be enough space between students, or neighbouring students should have different versions of the test
- Students’ desks should be clear except for any essential permitted writing and reference tools
- Official examination stationery should be provided by the institution; students should not be allowed to bring any of their own materials to the examination room, other than those explicitly permitted
- Should the supervisors have suspicions of cheating, they should follow a pre-defined, well-documented regulatory procedure to investigate the suspicions and to report the findings, including defining the process for searching a student for hidden unauthorised aids
- The regulations about examination practices, including what is permitted, what is not allowed and the consequences of breaking these rules, must be made very clear to all students well in advance of an examination

- The examination question paper must be kept safely and securely at all times during the design, moderation and printing process, to avoid any unauthorised prior access to the questions
- All students need to be identified by photo-ID, or similar means, before the examination begins, to prevent someone else taking an examination on behalf of a student
- If students are taking the examination remotely, not at a controlled university campus location, then additional means must be adopted to conclusively establish the identity of the student completing the examination and to ensure they are not making use of unauthorised aids
- The institution may consider adopting other methods to discourage different opportunities for cheating in examinations, should the need arise, such as use of cameras for additional surveillance of the candidates during the examination or use of jamming signals to discourage Wi-Fi communications
- The institution should remain vigilant and responsive to any new or evolving threats to the security of the examinations and the processes surrounding them.

At the institutional level, it is important to promote a community-wide approach to academic integrity, with students and faculty exercising individual responsibility (McCabe, 2005). Specifically, these measures should be adopted:

- Using unauthorised aids in examinations should be clearly defined as disciplinary misdemeanour or discouraged by an Honour Code.
- There should be a transparent standard set of sanctions applied to students found to be cheating in examinations
- Procedures for handling these cases should be clearly defined and made available to the whole community
- Regular education and training should be provided for all members of the community to encourage ethical practices and integrity.

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Contract cheating is currently one of the most severe ethical problems in academia. It is a type of plagiarism (student submits work written by someone else), but current text-matching software tools are not normally able to detect it (the ghost-writer produces original work). Software tools to support contract cheating detection are being developed. These methods can rely on artificial intelligence to identify an author according to the writing style and can make use of standards methods for text analysis to generate comparison metrics. Typically, if the style of writing in the assignment differs substantially from the style in previous assignments, the work is marked as suspicious.

There have been many studies on the prevalence of contract cheating in academia (Bretag et al., 2018; Clare et al., 2017; Dawson and Sutherland-Smith, 2018; Rowland et al., 2018). McCabe (2005) found that 7% of undergraduate and 3% of graduate students reported turning in work done by another person. In the research of Foltýnek and Králíková (2018), 8% of respondents in Czechia admitted contract cheating. Some studies report even higher numbers, e.g. 22% found by Hosny and Fatima (2014) in their Saudi-Arabian study.

A research study in Australia found substantial differences between responses from students and teachers when exploring different perceptions about the seriousness of contract cheating (Bretag et al., 2018; Harper et al., 2018), with students expressing far less concern about contract cheating than teachers. This study suggests that more communication is needed about the dangers of contract cheating, between teachers and students.

In 2017 quality assurance agencies in UK and Australia each produced guidance for the higher education sector on how they should address contract cheating (QAA, 2017; TEQSA, 2017). These resources provide recommendations for institutions about actions for deterring such conduct and developing policies for robust but fair handling of allegations. Some national and regional governments (17 US states, New Zealand and Ireland) have gone further by enacting legislation to ban commercial contract cheating companies and also making advertising of such services illegal (e.g. Houses of the Oireachtas 2018: 16-17) and other advocates elsewhere are encouraging introduction of such legislation (Draper and Newton, 2017; ICAI, 2018).

Paper mill (also so-called essay mill) refers to a commercial service organisation, normally web-based, supplying written materials (e.g. essays, reports, homework answers, personal statements, reflective journals) according to a client's requirements. Use of essay mills by students is a form of contract cheating. The products from paper mills can be bespoke, based on requirements provided by the client. Alternatively, clients may select items from a set of ready-made samples, such as an essay bank.

Typical target clients are students from secondary schools or higher education who make use of such services to avoid doing assessed work.

ENAI Recommendation

To discourage contract cheating, these measures can be adopted at the course level (Lancaster and Clarke, 2008, 2016; QAA, 2017; Walker and Townley, 2012):

- Avoid using the same assignments from year to year;
- Set assignments in stages so the tutor can monitor progress;
- Enhance students' motivation to elaborate the work by themselves;
- Limit opportunities for cheating by including a range of different assessment methods and personalising the requirements;
- Provide sufficient tutorial support – students should have the possibility of consultations with their tutor if the requirements are not clear to them;
- Set a verbal or written examination based on a written assignment: a presentation or the need to explain part of the assignment will advantage those who completed the coursework without third-party assistance;
- In programming assignments, requesting a small amendment to the program will help to find out whether students wrote the code themselves;
- Students should be asked to keep track of progress using a log book or journal, ideally with regular monitoring by the supervisor or tutor.

These measures are recommended at the institutional level (Lancaster and Clarke, 2008; QAA, 2017; Singh and Remenyi, 2016; Walker and Townley, 2012):

- Provide education for both staff and students about contract cheating;
- Focus on prevention of contract cheating rather than just on detection;
- Develop and apply robust regulations to address the issue of contract cheating;
- Clarity is important in communicating with students and staff about regulations relating to academic integrity;
- There should be standard set of sanctions for contract cheating that should be consistently applied and students should know about them;
- If possible block access to contract cheating sites at the university network or at least display a message on attempted access;
- An academic writing centre or advice service should be established to provide guidance and support for students and academics;
- Institutions should work with student organisations to help raise awareness of contract cheating;
- Engage with educational partners and providers at other levels and professional regulatory bodies with an interest in integrity, to alert them to the threats of contract cheating;
- A panel of trained staff need to be appointed to adjudicate on allegations of contract cheating;

- Detailed statistics should be maintained at institutional level about allegations and decisions on sanctions to enable monitoring of progress in detection and deterrence.

Walker and Townley (2012) conclude their paper with recommendation on balance between benefit and resource allocation: “*Diverting less of these resources to cheats, and more to supporting honest students and better study skills, would both support better practice overall, and potentially encourage more honesty in students and support the skills they need to honestly carry out their work.*” (p. 42).

The QAA guidance states that “contract cheating ... represents a clear threat to [higher education] providers’ ability to assure the standards of their qualifications” (QAA, 2017, p. 5) and it presents a very serious threat to the HE sector globally if not appropriately addressed.

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