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ETHICS OF SCIENTIFIC RESEARCH IN THE DIGITAL ENVIRONMENT

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ABSTRACT

Ethics of Scientific Research in the Digital Environment is considered one of the contemporary topics imposed by technological development and the shift toward the digital society.
The digital space has made available broad possibilities for collecting and analyzing data with speed and accuracy, but, in return, it has raised complex ethical problematics.
The principal problematic in this research lies in how to reconcile between the freedom of research and the benefit from digital data, and between the protection of individuals' privacy and their digital rights.
Questions also emerge about the legitimacy of using data available through electronic platforms without explicit consent from their owners.
The problematic is also related to the extent of the adequacy of current legislations to keep pace with the accelerated developments in the field of artificial intelligence and big data.
The research aims to clarify the concept of research ethics in the digital environment and its most important basic principles, and it also seeks to determine the ethical standards that the researcher ought to abide by when collecting digital data, processing it, and publishing it, and it likewise aims to strengthen the culture of scientific responsibility and transparency in the use of modern technologies.
In addition to proposing mechanisms to ensure the protection of participants and the safeguarding of the confidentiality of information.
The methodology relies on the descriptive-analytical method through analyzing the relevant literature and previous studies, and the comparative method may also be used to study some legislations and regulatory models in this field.
It also relies on the analysis of applied cases to highlight the real challenges that face researchers.
As for the expected results, they consist in highlighting the importance of adherence to ethical controls in the digital environment
It is also expected to present practical recommendations to strengthen data protection and ensure scientific integrity consolidating the culture of responsible research in the digital age.

KEYWORDS

Research Ethics, Digital Environment, Artificial Intelligence

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Introduction:

The last decades have witnessed a radical transformation in the scene of scientific research, as it moved from limited traditional environments to open and interwoven digital spaces. This transformation was not merely a change in tools and means, but it brought about an upheaval in the basic ethical concepts upon which research practice had long settled. In the digital environment, the traditional boundaries between the public and the private fade away, the roles of the researcher and the participant become entangled, and new problematics appear related to identity, ownership, and informed consent.

Ethics of Scientific Research in the Digital Environment represents an overlapping field of knowledge that combines moral philosophy, research methodology, information technologies, and law. The importance of this field is manifested in that it sets the controls and standards that guarantee the soundness of research practice, preserve the dignity of participants, and achieve scientific integrity, under unprecedented complexities imposed by the digital revolution.

This section comes to establish the conceptual framework for these ethics, through reviewing the theoretical foundations upon which they are built, and discussing the basic challenges that face researchers in the digital space, with presenting applied models that clarify how to deal with these challenges in light of well-established ethical principles.

The First Section: The Conceptual Framework and the Basic Challenges

The First Requirement: The Theoretical Foundations of Research Ethics in the Digital Environment

First: From the traditional principles to the digital framework

The foundational documents of research ethics, foremost among them the Belmont Report issued by the American Department of Health, Education, and Welfare in 1979 (National Commission, 1979), constitute the basic reference framework from which the discussions on research ethics in the digital environment started. This report identified three essential principles that remain valid until today, even though they require re-interpretation in the digital context:

The principle of Respect for Persons: it is based on the recognition of the autonomy of individuals and their right to determine their own fate, with providing special protection for the most vulnerable groups. In the digital environment, this principle turns into a major challenge related to how informed consent can be achieved when there is no direct meeting between the researcher and the participant, and when the identity of the participant is uncertain or multiple. (Buchanan, 2004)

The principle of Beneficence: it obliges researchers to maximize benefits and reduce potential harms. In the digital space, the question of estimating risks becomes more complex, as unexpected harms may arise from re-publishing data or from the possibility of identifying participants despite efforts of anonymization. (Dobrick et al., 2018)

The principle of Justice: it requires the fair distribution of the burdens of research and its benefits. In the digital context, this principle raises questions about who owns digital data, who benefits from it, and whether some social groups are excluded from research under the pretext of protecting them, which may reinforce their marginalization. (Hackett et al., 2024, pp. 5–20)

Second: The specificity of the digital environment and its impact on ethics

The digital environment is characterized by unique features that impose a reconsideration of the traditional conceptions of research ethics. Hermann Dibbell-Fischer explains in his book Research Ethics in the Digital Age that these features include: (Dobrick et al., 2018)

The unlimited nature of data: digital data are not finite or limited, but can be collected in massive quantities, reused in unexpected ways, and stored for an indefinite period. This creates challenges related to informed consent, since it is difficult to predict all the future uses of the data at the moment of collecting them. (Bundon et al., 2025, pp. 338–354)

The disappearance of geographical and legal boundaries: digital research goes beyond national borders, which creates legal complications related to the difference in data protection laws between states. What is permitted in one country may be illegal in another country, and this places researchers before multiple and overlapping legal systems. (Wyatt, 2013, pp. 1–18)

The dynamic nature of digital content: content on the internet is not fixed, but can be modified, deleted, or copied with ease. This raises questions about the stability of data and the validity of the conclusions based on them. (Hackett et al., 2024, pp. 5–20)

The overlap of roles: in the digital space, participants sometimes become researchers, and researchers turn into participants, and new roles appear such as “digital community managers” and “content producers” who have multiple interests in the research. (Bundon et al., 2025, pp. 338–354)

Third: The problematic of the public and the private in the digital space

The issue of distinguishing between what is public and what is private represents one of the most complex problematics in the ethics of digital research. In traditional spaces, the distinction was clear: the street is public, and the home is private. As for the digital space, these boundaries fade away and become entangled.

The research of Vanessa Dineen indicates that the concept of the “reasonable expectation of privacy,” upon which many laws and regulations rely, needs reconsideration in the digital environment (Deneen, 2018, pp. 34–36). A person who publishes a post on a public platform may have an expectation that its audience is limited, or may not be fully aware of the extent of the circle of dissemination.

Laura Roberts provides a useful classification of digital spaces on the basis of the degree of their openness (Roberts, 2015, pp. 314–325):

fully public spaces: such as public Facebook pages, and open Twitter accounts, where any person can view the content without restrictions.

semi-public spaces: such as closed Facebook groups that require joining them, or forums that require registration.

private spaces: such as private messages, and secret groups, where there is a clear expectation of privacy.

The framework of the Association of Internet Researchers (AoIR) affirms that judging whether the text is public or private cannot be absolute, but must take into account the context of the text, the type of platform, the habits of users, and the nature of the content. (Ess & Jones, 2004)

The Second Requirement: The Major Ethical Challenges in the Digital Environment

First: Informed Consent: Between Theory and Application

Informed consent is a basic principle of research ethics, but it is hard to use in the digital environment. The Economic and Social Research Council (ESRC) in the UK says that getting informed consent for digital research requires answering some important questions, such as how to get consent when there is no direct interaction. And what does it mean for consent to be "informed" if the participant doesn't know how their data will be used? and how can you be sure that the participant is able to give consent (Economic and Social Research Council, 2025)?

The National Centre for Social Research (NatCen) did a study that found that the opinions of people who took part in digital research about informed consent are very different. Some people think that just putting something in a public space means giving up the right to consent, while others think that consent must be clear no matter what kind of space it is (Woodfield, 2018).

Catherine Carpenter and David Dittrich offer a different way to handle this problem based on the idea of "tiered consent." In this model, people give their permission for different uses of the data, such as scientific publication, media publication, and reuse by other researchers. (Carpenter & Dittrich, 2011, pp. 36–42).

Second: privacy and anonymity are new problems.

One of the biggest problems with digital research is keeping participants' identities secret and protecting their privacy. That is because data that looks like it is anonymous on the outside may be easy to find the owners of with the search tools available or by combining different sources of data.

Andrea Bundon and her coworkers make it clear that the idea of privacy in the digital world is always changing and moving. Things that a user thinks are private today could be public tomorrow, and the other way around. Researchers face a problem because the privacy protection methods that seem appropriate when data is being collected may not be enough later on (Bundon et al., 2025, pp. 338–354).

This problematic raises a deep ethical question about the “right to be forgotten”. If the participant had agreed to the use of his data in the research, then later decided to delete these data from the original platform, is the researcher also obliged to delete them from his own dataset? This question becomes more complex when the data have already been published in research publications (Ninan, 2024, pp. 55–68).

Third: Emerging Risks and Re-use of Data

The possibility of re-using digital data for purposes that were not expected at the time of their collection raises multiple ethical problematics. The research of Ivana Ninaditch indicates that data which were collected for a specific research purpose may later be used in entirely different contexts, which may expose participants to risks they did not expect (Kramer et al., 2014, pp. 8788–8790).

One of the most prominent examples of this is the Facebook Emotion Contagion Experiment in 2014, where researchers modified the content appearing in users' news feeds in order to study the effect of that on their emotions. Although the data were aggregated, the experiment raised a wave of sharp ethical criticism, because the participants were not aware that they were part of an experiment, and their consent to the terms of service did not necessarily mean their consent to be the subject of a psychological experiment (British Psychological Society, 2021).

The guidelines of the British Psychological Society (BPS) stress the necessity that researchers assess the risk of discovering illegal or harmful content during the collection of digital data, and that they prepare clear plans for dealing with such cases in a manner consistent with legal and ethical obligations (Bundon et al., 2025, pp. 338–354).

As for the question of justice and fairness in digital research, ethics do not stop at protecting participants from harms, but extend to ensuring justice in access to the benefits of research and in distributing its burdens. In the digital context, this principle appears in several aspects.

The first of them is: the question of exclusion from research under the pretext of protection. As Bundon, Goudieir, and Olive indicate, excluding certain groups (such as children, or marginalized groups, or local communities) from digital research on the claim of protecting them may lead to reinforcing the marginalization of these groups, because they will be absent from the knowledge that is produced about the issues that concern them (Wyatt, 2013, pp. 1–18).

The second of them is: the question of who owns digital data. Digital platforms are the actual owner of the data produced by users, and they set conditions for their use. This raises questions about the right of researchers to use these data, the right of participants to control them, and the relation between the interests of researchers and the interests of the platforms (Bundon et al., 2025, pp. 338–354).

The third of them is: the question of the digital divide. Research that depends on access to the internet and digital services may automatically exclude those who do not possess this access, which makes the results unrepresentative of the population as a whole, and reinforces the stereotyped image of digital societies as being representative of everyone (Ess & Jones, 2004).

The Third Requirement: The Reference Frameworks and the Ethical Guidelines

1. The Guidelines of the Association of Internet Researchers (AoIR)

The guidelines issued by the Association of Internet Researchers (Association of Internet Researchers - AoIR) are considered among the most important references in this field. Their first version was issued in 2002 authored by Charles Ess and Steve Jones, and they were later updated in order to keep pace with the accelerated developments (Ess & Jones, 2004).

The AoIR guidelines are characterized by several features: first, they focus on general principles rather than rigid rules, recognizing that digital contexts differ greatly such that it is not possible to set unified rules that apply to all. Second, they encourage "casuistic reasoning" which compares new cases with previous similar cases, while taking into account the specificity of each context. Third, they affirm that ethics are not merely formal procedures for obtaining the approval of ethics committees, but rather a continuous practice that accompanies the research in all its stages (British Psychological Society, 2021).

2. The Guidelines of the British Psychological Society (BPS)

The Ethics Guidelines for Internet-Mediated Research issued by the British Psychological Society were published in 2013 and were later updated. These guidelines are distinguished by their detailing of the practical issues facing researchers (British Psychological Society, 2021).

Among the most prominent things included in these guidelines are: directions on how to deal with different platforms according to the degree of their privacy, criteria for determining when it is acceptable to use published data without explicit consent, guidelines on protecting researchers themselves from potential risks (such as exposure to disturbing content or threats from participants), and clear procedures for dealing with cases of discovering illegal content (Economic and Social Research Council, 2025).

3. The Guidelines of the Economic and Social Research Council (ESRC)

The Economic and Social Research Council in the United Kingdom provides comprehensive guidelines for online research, which focus on the practical and legal aspects. These guidelines are marked by their focus on the issue of jurisdictional complexity that arises when digital research crosses national borders (Economic and Social Research Council, 2025).

The guidelines indicate that researchers must be aware of the data protection laws in the countries where the participants are located, and not only in the country of the researcher or the research institution. This

represents a major challenge in internet research that may include participants from dozens of different countries (Economic and Social Research Council, 2025).

The guidelines also affirm the necessity of respecting the terms of use of digital platforms, while stressing that these terms are not a substitute for adherence to ethical standards, especially when the platform adopts standards less strict than what ethical research requires (Walstrom, 2004).

It becomes clear from this review that Ethics of Scientific Research in the Digital Environment represents a qualitative shift in ethical thought related to research. If traditional ethics focused on protecting participants in experiments specific in time and place, digital ethics is compelled to deal with data permanently changing, participants of multiple identities, and interwoven contexts that go beyond traditional boundaries.

The discussion has shown that the traditional ethical principles (Respect for Persons, Beneficence, Justice) remain valid as a basic reference, but they need re-interpretation and application in the digital context. It has also shown that the ethical challenges in this field are not confined to issues of privacy and informed consent, but extend to broader questions related to justice and fairness, ownership, and the relation with digital platforms.

We have reviewed the most important reference frameworks that provide guidance for researchers, and we have noticed a general tendency toward adopting flexible principles that respond to the diversity of contexts, instead of rigid rules. This reflects a growing awareness that ethics in the digital environment are not a set of ready-made recipes, but rather an ongoing reflective practice that requires from the researcher awareness, responsibility, and the capacity to balance between multiple interests.

The Second Section: Contemporary Issues and Practical Applications in Ethics of Digital Research

After we reviewed in the first section the theoretical foundations and the basic challenges of research ethics in the digital environment, this section turns to explore the contemporary issues and the practical applications that face researchers in the field of work. If theories provide the general framework, then actual practice is what tests the solidity of this framework and reveals its gaps and the possibilities of developing it.

This section addresses four principal axes: first, the analysis of practical cases that clarify how to deal with ethical dilemmas in varied research contexts. Second, the exploration of emerging challenges connected with artificial intelligence and big data. Third, the discussion of issues of publication and the ethical sharing of digital data. And fourth, the presentation of practical recommendations for researchers and for the bodies concerned with ethical evaluation.

The First Requirement: Case Studies in Ethical Practice

1. Case Study: Research in Online Support Communities

Online support communities (such as patients' forums, and psychological support groups) represent a highly sensitive research context. Mary Walstrom reviewed in her research the case of a female researcher who studied an online support group for cancer patients, and found herself before a dilemma: while the data were available to everyone in a semi-public group, the members of the group considered it a private space for them (Walstrom, 2004).

The researcher dealt with this dilemma through adopting the strategy of the "researcher as participant-experiencer" (researcher/participant-experiencer), where she participated in the group as a member before beginning her research, and requested the consent of the members to use their conversations in the research, and agreed to present the results to them before publication. This approach, although it took a longer time, achieved a greater degree of trust and ethical authenticity (Robinson, 2018).

Joanna Robinson indicates in a similar study on eating disorder forums that prolonged involvement in digital communities may create additional challenges related to the boundaries between the role of the researcher and the role of the member. The researcher found herself in situations in which her responsibility as a researcher conflicted with her obligations as a member in the community, which compelled her to set clear rules for herself about when she acts as a researcher and when she acts as a member (Townsend & Wallace, 2016).

2. Case Study: Twitter and Research on Sensitive Issues

The Twitter platform (currently X) represents a rich research environment, but it raises multiple ethical challenges. A case study carried out by the University of Sheffield reviewed how Twitter data may be dealt with in research related to sensitive issues (Townsend & Wallace, 2016).

In this study, researchers wanted to analyse tweets related to depression and suicide. The team faced a dilemma: can tweets related to a sensitive topic in a public space be considered as a kind of consent to their

use in research? And how can the privacy of their owners be protected while preserving the soundness of the analysis?

The team relied on several procedures: first, they consulted the ethics committee at their university before beginning. Second, they applied strict standards for anonymization, including not publishing the full texts of the tweets, but rather presenting summaries and analyses. Third, they developed a mechanism for dealing with tweets that indicate an imminent danger (such as suicide), which included notifying the platform and providing information about support services. Fourth, they published their methodology clearly in order to discuss the ethical decisions they had taken (MacDonald et al., 2019, pp. 398–415).

This case shows that research on public platforms does not mean the absence of ethical responsibility, but rather requires a greater awareness of the context and the possible risks.

3. Case Study: Dating Applications and the Challenges of Boundaries

Dating applications such as Tinder represent a unique research context because of their sensitive nature. A study by Jamie MacDonald and her colleagues reviewed the ethical challenges they faced in a research about the identity of users on Tinder (MacDonald et al., 2019, pp. 398–415).

One of the main challenges was that analysing users' profiles (which are available to the public within the application) may be considered a violation of privacy, because users do not expect that their profiles would become the subject of academic analysis. Also, trying to contact users in order to obtain their consent was difficult, because the application does not provide a means of communication outside the dating framework.

The researchers dealt with these challenges through: limiting the analysis to the visible data (images and short texts) without trying to identify their owners, avoiding the collection of sensitive data or precise location information, publishing aggregated results only without individual examples that can be identified, and explicitly acknowledging in the publications the ethical restrictions they imposed on themselves (Bundon et al., 2025, pp. 338–354).

The Second Requirement: Artificial Intelligence and Big Data: New Challenges on the Horizon

First: Ethics of Using Artificial Intelligence in Research

The accelerated development in artificial intelligence techniques constitutes a new turning point in the ethics of digital research. Andrea Bundon and her colleagues indicate that the use of artificial intelligence in research raises unprecedented questions about the nature of the knowledge produced, the relationship between the researcher and the data, and responsibility for the results. (St. Amant, 2018)

Among the most prominent ethical challenges associated with artificial intelligence:

- Bias and algorithms: artificial intelligence algorithms may reflect biases existing in the data on which they were trained, which leads to the reproduction of these biases in research results. This creates an ethical responsibility upon researchers to examine their algorithms and their data with precision (McKee & McGinnis, 2023, pp. 101–118).

- Transparency and explainability: artificial intelligence models often function as black boxes whose decisions are difficult to interpret. This conflicts with the principle of transparency in scientific research, where the methodology is supposed to be understandable and open to examination (Sedzielarz & Kohler, 2023, pp. 1560–1575).

- Privacy in the age of large-scale analysis: artificial intelligence techniques can reveal patterns and correlations that were not visible in the raw data, which may lead to violating the privacy of participants in ways they did not expect when they gave their consent (Sedzielarz & Kohler, 2023, pp. 1560–1575).

Second: Ethics of Big Data

Big data constitute a particular challenge for research ethics for several reasons. Kirk St. Amant indicates that the volume of data, their diversity, and the speed of their flow make it almost impossible to apply traditional ethical procedures such as individual informed consent (Bullock & Saunders, 2024, pp. 42–58).

Ellen McGhee and Colleen McGinnis, in a study on the ethics of big data, raise four central issues (Bullock & Saunders, 2024, pp. 42–58):

- Re-use of data: big data sets that were collected for commercial or governmental purposes are often used for research purposes that were not expected when they were collected. This raises questions about whether users consented to these uses, and if they did not consent, can the use of their data be justified as "pre-existing data"?

- Ongoing consent: with big data that change continuously, the concept of informed consent at one single point in time becomes insufficient. Alternatives have appeared such as "dynamic consent," which allows participants to modify their consent over time, but its application on a wide scale still remains difficult.

- Bias in samples: despite the vastness of the data, they often represent particular categories of the population (such as those more connected to the internet or more active on certain platforms), which creates methodological biases that may not be clear to researchers.

- Cumulative risks: each individual use of data may not pose a major risk, but the accumulation of multiple uses may create a comprehensive profile of participants that exposes them to risks they did not expect.

Third: Ethics of Machine Learning in Humanities Research

The uses of machine learning in humanities and social research are increasing, which creates additional ethical challenges. Sandrine Sedzie and Thomas Kohler indicate that the application of machine learning techniques to human texts (such as interviews and diaries) raises questions about whether these techniques can understand the cultural and social context of the texts, and whether reducing the texts to digital patterns strips them of their human dimension (Roberts, 2013).

Also, the use of machine learning to analyse sensitive content (such as conversations about mental health or violence) creates an added responsibility regarding how to deal with content that algorithms may detect without human intervention.

The Third Requirement: Ethical Publication and Sharing of Data

First: Challenges of Publishing Digital Data

The publication of research data represents a crucial aspect in scientific transparency, but it becomes complicated in digital research because of the difficulty of fully concealing the identity of participants. Emma Bullock and Catherine Saunders indicate that the open publication of digital data (open data) may conflict with the commitment to protecting the privacy of participants (Woodfield, 2018).

This dilemma raises practical questions: how can a balance be achieved between the principle of scientific openness and the principle of protecting participants? Can the data be published only in aggregated form, while keeping the primary data in closed archives? And are anonymization procedures (such as deleting names and locations) sufficient to protect participants in an age in which multiple data sources can be combined in order to identify persons?

Alice Marple indicates in a research on ethical publication that the solution may lie in adopting the approach of "managed access" instead of fully open publication, where qualified researchers can access the data after the approval of an ethics committee, and by following strict procedures for protecting privacy (Woodfield, 2018).

Second: Intellectual Property and Plagiarism in the Digital Environment

The digital environment raises new issues concerning intellectual property and plagiarism. Gerhard Dannemann reviews in the book Research Ethics in the Digital Age the experience of the VroniPlag Wiki platform in documenting cases of academic plagiarism, which showed how digital communities can play an important supervisory role (Woodfield, 2018).

Also, the use of digital content (such as images, videos, and excerpts) in research publications raises questions about copyright and fair use. What is permitted under copyright laws may not be sufficient from the ethical side, especially when it concerns content related to individuals or communities (Woodfield, 2018).

Third: Publishing Sensitive Research: Between the Public Interest and Protecting Participants

Research dealing with sensitive issues (such as terrorism, violence, and mental health) faces particular challenges at the stage of publication. On the one hand, there is a public interest in publishing knowledge about these issues. On the other hand, publication may lead to causing harm to participants or communities, or to providing information that can be exploited in a harmful way.

Derek Roberts indicates in an analysis of readers' comments on the Detroit crisis that publishing research on sensitive issues may lead to reproducing stereotypes or provoking violent reactions against certain communities (Woodfield, 2018). This creates a responsibility upon researchers to assess not only the direct risks to participants, but also the broader social risks of publishing their results.

It becomes clear from this section that research ethics in the digital environment are not a set of ready-made rules that can be applied mechanically, but rather a continuous reflective practice that requires from researchers awareness of the context, the ability to balance between multiple interests, and the readiness to modify practices in response to changes.

The case studies that we have reviewed have shown that successful ethical solutions are often contextual solutions, emerging from a deep understanding of the digital community under research, and developing with the development of the relationship between the researcher and the participants. They have also shown that ethical challenges increase with the development of digital technologies, especially with the entry of artificial intelligence and big data into the field of scientific research.

At the end of this section, we have presented a set of practical recommendations for researchers, ethics committees, and funding bodies, aiming to strengthen ethical practice in this evolving field.

Conclusion:

It can be said that Ethics of Scientific Research in the Digital Environment represents a qualitative shift in ethical thought related to research. If traditional ethics used to focus on protecting participants in experiments limited in time and place, digital ethics is compelled to deal with constantly changing data, participants with multiple identities, and interwoven contexts that go beyond traditional boundaries.

The discussion in the first and second sections has shown that the traditional ethical principles (Respect for Persons, Beneficence, Justice) remain valid as a basic reference, but they need re-interpretation and application in the digital context. It has also shown that the ethical challenges in this field are not confined to matters of privacy and informed consent, but extend to broader issues related to justice and fairness, ownership, and the relationship with digital platforms.

What distinguishes the digital age is not only the emergence of new technologies, but also a change in the nature of knowledge itself and in the relationship between the researcher, the participant, and society. In this context, ethics becomes a continuous practice, and not a set of fixed rules. The researcher's ability for critical reflection, open communication with participants, and readiness to adjust the course, becomes the real guarantee for the soundness and integrity of the research.

The greatest challenge before researchers in the digital environment is to preserve the balance between benefiting from the immense possibilities made available by digital technologies, and adhering to the ethical values that protect the dignity of participants and ensure the integrity of science. This balance is not fixed, but rather requires continuous review and an open dialogue between researchers, participants, academic institutions, and the wider society.

- **Practical recommendations for researchers and ethics committees**

1. For researchers: practical guiding principles

Based on the previous review, a set of practical guiding principles can be presented for researchers in the digital environment:

- Early ethical planning: ethical considerations must begin from the stage of designing the research, and not as a later stage. This includes assessing potential risks, identifying procedures for protecting privacy, and planning how to deal with unexpected cases (such as the discovery of illegal content).
- Distinguishing between digital contexts: the same ethical standards cannot be applied to all digital contexts. Researchers must assess each platform and each community according to its characteristics, while taking into account the degree of its openness, the expectations of its users, and the nature of the exchanged content.
- Documentation and transparency: researchers ought to document their ethical decisions clearly, and explain them in their publications. This not only enhances transparency, but also contributes to developing collective knowledge about ethical practice in digital contexts.
- Flexibility and responsiveness: unexpected changes may arise during the research (such as a change in platform policies, or the emergence of new risks). Researchers must be prepared to modify their ethical procedures in response to these changes.
- Consultation and seeking experts: the individual researcher cannot encompass all the ethical and legal complexities in the digital environment. It is advised to consult ethics committees, and to seek the help of experts in law and data protection when needed.

2. For research ethics committees: developing practices

Research ethics committees face major challenges in evaluating digital research, given the speed of its development and the diversity of its contexts. These committees can develop their practices through:

- Forming specialized expertise: research ethics committees can seek the assistance of members who have expertise in digital research, or cooperate with external experts when evaluating complex research proposals.
- Developing flexible guidelines: instead of applying rigid standards, guidelines can be developed that respond to the diversity of digital contexts, with a focus on general principles and ethical reasoning rather than strict rules.
- Cooperation between institutions: given the cross-border nature of digital research, ethics committees in different institutions can exchange expertise and develop shared practices.
- Keeping pace with developments: ethics committees must follow technological and legal developments, and continuously update their guidelines in order to keep pace with new developments.

3. For funding bodies and publishers: a supportive role

Research funding bodies and academic publishers play an important role in strengthening ethical practice, through:

- Providing resources: funding bodies can allocate resources for training in digital ethics, and for developing tools and resources that help researchers deal with ethical challenges.
- Setting standards for publication: publishers can establish clear standards on how ethical decisions should be documented in publications, and the requirements of data sharing while protecting privacy.

Supporting alternative models: models of publication can be supported that make possible a balance between scientific openness and the protection of participants, such as publication with managed access to data.

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