Journal on Interactive Systems, 2025, 16:1, doi: 10.5753/jis.2025.5977
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Enhancing Ethical Communication in Brazilian Computing Research: A Framework for Human Involvement Reporting

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Received: 29 April 2025 • **Accepted:** 22 August 2025 • **Published:** 26 August 2025

Abstract: *Background:* Brazilian computing research exhibits notable deficiencies in reporting human participation, with inconsistent ethical communication practices that compromise transparency and reproducibility. *Goal:* This study analyzes current practices for reporting human involvement and proposes a standardized textual framework to enhance the communication of human participation in computing research. *Methods:* We conducted a secondary analysis of more than 10,000 publications from SBC symposia (2013–2022), identifying patterns through keyword searches and content analysis. Using a pragmatic methodology, we developed a framework grounded in ethical requirements from Brazil's CEP/Conep system and best practices from the literature. *Results:* Our analysis revealed: (1) most studies involving humans lacked CEP documentation; (2) widespread inconsistencies in terminology; (3) insufficient participant characterization. The proposed framework addresses these issues by defining mandatory and recommended reporting elements, including types of involvement, ethical approvals, risk disclosures, and participant profiles. *Conclusion:* This work introduces the first standardized approach to reporting human participation in Brazilian computing research. Although simple in design, the framework represents an important step toward ethical transparency and provides a foundation for future improvements in research communication practices.

Keywords: Ethics, Computational Ethics, Research Ethics, Meta-science, Brazilian Institutional Ethics, Ethics Committee

1 Introduction

Conducting science or research, as inherent to all human actions, involves practices with ethical or moral dimensions [Babbie, 2021]. Within Computing research instances, many lack the involvement[1] of individuals beyond researchers—traditionally limited to authors or co-authors of scientific work[2]. Others, however, do involve people through anonymous system feedback surveys or biomedical studies with invasive computational devices. Regardless of involvement degree, research involving people carries specific ethical [Blundell, 2021; Lazar *et al*., 2017; Singer and Vinson, 2002] or moral [Brasil, 2012, 2016; Chimentão and Reis, 2019; de Lima, 2015] considerations. Currently, as shown by some results of this work, these aspects remain little recognized in Computing.

Triggered by atrocities committed by researchers during Nazi experiments (1933–1945), institutional science began codifying moral norms to enforce deterministic ethical standards for human involvement in research [Blundell, 2021]. Since the 1940s, these norms have expanded unevenly across disciplines and while well-established in Health sciences, Computing lags behind, exhibiting ignorance, reluctance, or even bad faith [Baase and Henry, 2017]. This stems partly from Computing's historical legacy as a "hard science" [Wazlawick, 2014], where human participation was minimal, e.g., early computer development, mathematical computing, algorithms.

As computational systems proliferated, human factors became critical to Computing research [Lazar *et al*., 2017]. Ethical reflections emerged as early as the 1940s, gaining momentum by the 1980s [Bynum, 2018]. In Brazil, the regulatory frameworks for human involvement in research was originated in Health sciences, not Computing [ANPEd, 2019]. A landmark was the 1996 establishment of the CEP/Conep system (Research Ethics Committees) under the National Health Council (*Conselho Nacional de Saúde* – CNS) [ANPEd, 2019].

While regulations emphasize Health sciences research [Brasil, 1996, 2012, 2016], their ethical principles demonstrate transferability to Computing. Closer analysis reveals that phenomena in human-involved computational research share core similarities.

This work presents secondary research and pragmatic-transformative approaches [Creswell and Creswell, 2018; Marconi and Lakatos, 2017; Pimentel, 2017] to advance moral agency in Brazilian Computing research involving humans. Focusing on Ethics Committees (*Comitês de Ética em Pesquisa* – CEPs) and improving chaotic, unstructured

[1] In this work, the term "involvement" broadly covers (*lato sensu*) possible meanings of engaging people in research beyond the respective authors. This includes active participation, e.g., deliberate engagement; or passive involvement, e.g., scenarios where social media data is used without direct consent. Animal involvement is outside this work's scope.

[2] Specific ethical/moral aspects relate to researchers' participation in their own studies, but such involvement is excluded here, e.g., risks from being subjects in their own procedures.

communication practices in publications, we aim to: (i) as secondary research, structure and map CEP adoption in Brazilian Computing, emphasizing conference papers; (ii) as pragmatic research, propose a communication framework for human involvement, aligned with Human-Computer Interaction (HCI) initiatives; (iii) as transformative approach, disseminate this knowledge to foster meta-scientific moral progress.

Results indicate scarce mentions of CEPs or Informed Consent Forms (*Termo de Consentimento Livre e Esclarecido* – TCLE), essential to Brazil's research ethics, in publications, far below expected levels. Fewer still critically address ethical or moral dimensions beyond compliance.

This work takes initial steps toward an ethical climate-building through objective mechanisms. Current reporting of human involvement aspects is often deficient, undermining scientific communication, e.g., hindering replication. Technical details frequently overshadow human dimensions.

The paper is structured as follows: Section 2 outlines foundational concepts; Section 3 reviews related work; Section 4 details methodology and ethical reflections; Section 5 presents findings; and Section 6 concludes with discussion and final remarks.

2 Theoretical and Conceptual Foundation

This section presents the concepts and definitions used in this work or necessary for its conceptual contextualization. Vázquez [2018] presents the epistemological foundations and bases in Ethics or Morals followed in this work. The branch of Ethics in intersection with computing is known as Computational Ethics [Hall, 2014], presenting extensive respective literature in English available [Barger, 2008; Johnson, 2008; Reynolds, 2019; Blundell, 2021], while almost none in Brazilian Portuguese [Carvalho *et al*., 2021a], , Masiero [2013] being one single example.

The very act of conducting science or research inherently involves ethical and moral dimensions. As computational systems increasingly proliferate and human factors become critical to computing research, ethical considerations expand significantly beyond traditional boundaries. This calls for a shift from a reactive, compliance-focused approach to a proactive, principled approach, acknowledging the profound societal impact of technology.

2.1 Normative institutional research ethics involving people in Brazil

People conduct research across many fields of knowledge, and as ethical issues associated with new technologies transcend technological boundaries and directly impact society, there are factors intrinsically linked to human dimensions. In the early 2000s, Padilha *et al*. [2005] indicated that researchers often focused on bureaucratic aspects of research, e.g., authorizations and operational procedures, while failing to adequately consider people's involvement. The findings of this present work indicate that this phenomenon persists.

Aspects directly concerning research participants needs specific safeguard, whether they are researchers themselves or the focus of research interventions, e.g., preventing unnecessary risk exposure or eliminating any form of discrimination. Achieving these protections requires employing appropriate methodologies, materials, and equipment tailored to each study's context [Brasil, 2016; Resnik, 2018; ANPEd, 2019].

The literature describes various research methods, not all of which involve people directly [Creswell and Creswell, 2018; Wazlawick, 2014]. Cesário *et al*. [2020] conceptualize scientific research as operating on two levels. In theoretical level, develops abstract theories about social or natural phenomena; and empirical level tests theoretical concepts through observable reality.

Categorically, several research models involves people [de Pádua, 2019], such as:

- Experimental research: Evaluates outcomes of novel or established procedures under controlled conditions, typically hypothesis-driven. Widely used in Health sciences;
- Survey research: Studies phenomena within populations using structured questionnaires or interview protocols. Common in Social Sciences and software quality evaluation;
- Case study research: Examines few research subjects through isolated cases or small groups. Applicable across disciplines for in-depth individual or group analysis.

Researchers must select strategies that best suit their phenomena of interest while remaining adaptable to achieve precise objectives. These methods follow well-defined, replicable steps governed by disciplinary conventions. Methodological rigor generates trustworthy results amenable to detailed analysis and comparable findings across related studies [Creswell and Creswell, 2018; Marconi and Lakatos, 2017].

Adequately applied practices yield reliable results adhering to ethical guidelines, protection of participant vulnerabilities, safeguarding of freedoms, mitigation of foreseeable harms, among others.

When research involves participants beyond investigators, compliance with relevant resolutions [Brasil, 2012, 2016] and potential CEP/Conep system engagement becomes mandatory [Brasil, 2012] [3]. Some cases may qualify for CEP exemption [4]. Here, we exclusively address cases unequivocally requiring CEP appraisal.

Research projects involving human participants are submitted to a CEP via the online *Plataforma Brasil*[5][6]. The research proposal designates investigators/specialists conducting the study, while other individuals are classified as

[3] This work aligns with Brazilian Research Ethics moral norms, e.g., CNS resolutions. Notably, we neither critique nor analyze these frameworks.

[4] CEP coordinators further recommend avoiding submissions for objectively exempt studies to prevent workload overload and delays for non-exempt research [Carvalho *et al*., 2023b].

[5] `https://plataformabrasil.saude.gov.br/login.jsf` [accessed: 22-08-2025]

[6] Some institutions maintain independent CEPs or extraordinary procedures. This work addresses the generic submission-appraisal process *lato sensu*, though most cases occur through *Plataforma Brasil*.

participants—the latter subject to ethical protections per resolutions [Brasil, 2012, 2016].

CEP submissions must detail participant involvement, e.g., participants characteristics, specific ethical considerations. Detail depth varies by study type, CEP requirements, and investigators' rigor. Certain studies need neither fixed participant numbers nor minimum thresholds [Creswell and Creswell, 2018; Neuman, 2014; Guest *et al*., 2013].

2.2 Repeatability, reproducibility and replicability

Conversely, a key scientific quality metric involves experimental or applied results' relationship to future research [Creswell and Creswell, 2018; Wazlawick, 2014]. The ACM (Association for Computing Machinery) [7] formalized three reproducibility scenarios (Table 1). Human involvement is central to such dynamics, with meta-analyses providing critical input for meta-scientific inquiry [Riley *et al*., 2010].

Upon closer examination, the content of Table 1 primarily addresses "hard sciences" research. When experiments involve human factors, their generalizability, including the objectives outlined in Table 1, becomes limited or, in rare cases, impossible [Wieringa, 2014]. Nevertheless, qualitative potential persists for repeating, reproducing, or replicating such studies with maximal fidelity, given applicable constraints.

Consider a hypothetical study proposing a computational artifact to support instruction for children with Autism Spectrum Disorder (ASD). The researcher reports promising results from tests involving both children with ASD and specialized educators, indicating CEP approval and compliance with ethical requirements.

Should another researcher attempt to implement this approach, critical questions arise. As participant specifics, how many children yielded positive outcomes? What was the educator-to-child ratio? As participant characteristics, what were the ASD severity levels among participants? Regarding documentation, is the CAAE (*Certificado de Apresentação para Apreciação Ética* – Certificate of Ethical Appreciation) available on *Plataforma Brasil*? Are consent/assent forms accessible? Finally, design validity, does the artifact specify minimum or maximum user thresholds? Would results hold without specialized educators?

Communication of human factors in Computing research is often neglected, with disproportionate emphasis on technical outcomes. This gap sometimes stems from unawareness of scientific communication standards [Creswell and Creswell, 2018; Wazlawick, 2014; Marconi and Lakatos, 2017], a challenge this work addresses.

Even studies with limited generalizability, due to human factors or otherwise, benefit from transferability analysis, where scientific communication quality proves pivotal. Indirect advantages emerge, such as leveraging CEP submission data for similar target populations. For instance, do studies involving children with severe ASD require unique CEP considerations? Beyond formal CEP requirements, what ethical reflections should researchers undertake?

2.3 Philosophical imperative of research ethics

The framework proposed in this document intentionally emphasizes the compliance with Brazil's CEP/Conep system and related legal normative structures, ethical communication in scientific research. However, it cannot be reduced to bureaucratic or procedural adherence. To advance toward a more mature ethical culture, it is essential to emphasize that legal compliance represents only a partial threshold of responsibility. Effective ethical progress in computing research emerges when researchers recognize that their practices have broader societal, cultural, and human consequences that extend beyond formal approval processes.

From an existentialist materialist perspective, Vázquez [2018] states that "ethical" is not a quality of the individual, but of actions. Therefore, a person can be colloquially considered "ethical" if their decisions are consistently guided by ethical principles. Yet, strictly speaking, it is the actions, and not the essence of the individual, that can be judged as ethical or unethical. This distinction is crucial for computational research, a researcher's ethical posture is not demonstrated by declarations of personal virtue, but by the quality of decisions embedded in the design, execution and communication of their studies.

In this view, choosing not to submit a study is an ethical decision, insofar as it is grounded in a process of ethical deliberation, even if, controversially, the choice is immoral. A researcher can deliberately choose the path of immorality, and this still constitutes an ethical choice because it reflects a decision-making process oriented by values and consequences. Such reflections emphasize the asymmetry and responsibility inherent in research, where ethical awareness is present about whether actions align with morality.

Other theorists, such as Jonas [2014], provide a philosophical lens through which to view this expanded responsibility. Jonas [2014] argues for the so-called Imperative of Responsibility. His reflections underscore that technology is not neutral, but rather a transformative force capable of reshaping human nature itself. For Jonas, scientific and technological practices must be guided by an ethics oriented towards the preservation of human dignity and the prevention of irreversible harm. This perspective is particularly relevant for computing research in Brazil, where studies frequently engage vulnerable populations, process personal data, and design artifacts that intervene directly in social contexts.

Ethical responsibility in science is not bilateral or negotiated merely between researchers and participants [Jonas, 2014]; instead it is unilateral, imposed on researchers by the very fact that their actions can impact others who may not have a voice in the process. In this sense, computing scholars are called to act with greater prudence, recognizing the asymmetry of power inherent in technological development. Good practice in ethical communication should not only aim to ensure compliance with formal requirements (e.g., CEP approval, informed consent forms), but also to make the researcher's reflexivity about potential risks, unintended consequences and societal implications explicit.

[7] `https://www.acm.org/publications/policies/artifact-review-and-badging-current` [accessed: 22-08-2025]

Table 1. How experimental research results relate to other studies.

Purpose	Condition	Definition
Repeatability	Same team. Same experimental setup.	Measurements can be obtained with stated precision by the same team using identical measurement procedures, systems, and operational conditions at the same location across multiple trials. For computational experiments, this means a researcher can reliably repeat their own computation.
Reproducibility	Different team. Same experimental setup.	Measurements can be obtained with stated precision by a different team using the same measurement procedure and system under identical operational conditions, either at the same or a different location. For computational experiments, this means an independent group can achieve equivalent results using the author's original artifacts.
Replicability	Different team. Different experimental setup.	Measurements can be obtained with stated precision by a different team using distinct measurement systems at separate locations across multiple attempts. For computational experiments, this means an independent group can obtain consistent results through artifacts developed entirely independently.

In addition, the intersection of ethics and computing, referred to as Computational Ethics [Hall, 2014], has generated extensive debate and literature. The work of Barger [2008]; Johnson [2008]; Reynolds [2019]; Blundell [2021] highlights that computing technologies are never neutral, but deeply value-laden. They embody choices about inclusion, exclusion, privacy, fairness, and sustainability, all of which extend the scope of responsibility for computing researchers. By situating our framework within this tradition, we reinforce its function as a pragmatic artifact that embeds ethical scrutiny into everyday research communication, while also opening pathways for broader philosophical reflection.

The proposed framework is a pragmatic artifact, a textual structure that translates these philosophical principles into actionable reporting practices. The textual framework, while pragmatic and focused on concrete reporting elements, serves as a direct mechanism for this broader ethical imperative in practice. By explicitly requiring details on involvement type, participant counts, ethical approvals, risk disclosure, and special profiles, it nudges researchers toward greater reflection, transparency and accountability.

Thus, our contribution does not intend to replace moral philosophy, but complements it. It shows that by anchoring research communication in structured artifacts, computing research in Brazil can bridge the gap between compliance-driven practice and ethically reflective science.

3 Related Works

Other Brazilian researchers have previously addressed ethical issues in human subjects research, including researchers in Human-Computer Interaction (HCI). In addition, the literature contains extensive work on Research Ethics that expands on the scope of this paper, presented in Section 2.

The National Association for Graduate Studies and Research in Education (*Associação Nacional de Pós-Graduação e Pesquisa em Educação* – ANPEd) has openly published three volumes on Research Ethics in Education [ANPEd, 2019, 2021, 2023]. Despite the education-oriented title, these cover diverse topics relevant to HCI research.

The "Research Ethics Collection" includes volumes on specific themes, such as one dedicated to human participation [Witiuk *et al*., 2018] and another on general principles [da Cunha *et al*., 2018].

For De La Fare *et al*. [2014], the debate on regulating research ethics in the field of Education should involve educational and pedagogical aspects, important for promoting integrity and ethics in the scientific community. The authors advocate ethical plurality and the recognition of symmetry between areas of knowledge, emphasizing that there are specificities. According to De La Fare *et al*. [2014], the literature on research ethics in the humanities and social sciences presents many intersections, which requires a strategic focus and classification. In this area, as in Computing, there is much discussion about the conflict between the biomedical and humanities fields regarding the establishment of research ethics committees and their standards, since the other fields are subordinate to the biomedical logic of research with human beings [Zaluar, 2015].

Severino [2019] argues that the nature of education as an intentional practice, both epistemologically and ethically, "demands even more acute ethical demands, given the radical engagement with people's historical existential destiny". This condition, for the author, "requires that educational researchers maintain accurate epistemological rigor in their investigative procedures and a committed ethical sensitivity to human dignity".

Also in the field of Social Sciences, Savi and Fare [2019] analyze the Brazilian Resolution No. 510/2016 [Brasil, 2016] from three perspectives, formative, philosophical, and normative; to verify "the possibilities of ethical autonomy in research as opposed to normative heteronomy, especially in the educational field, as part of the Human, Social, and Applied Social Sciences". The authors conclude that "it is necessary to integrate researchers as fundamental parts of a model to be applied at all levels of society for research training guided by ethical autonomy from basic education, and with due social recognition for Human, Social, and Applied Social Sciences researchers".

Computer Science researchers such as Bispo Jr. *et al*.

[2021], as well as the authors of this present work, corroborate the discussion on the ethical issues and specificities of each field. However, we agree that it is necessary to preserve the necessary conditions for advances in scientific research to occur without violating dignity and human rights. This is one of the challenges of research ethics in Computer Science. For Bispo Jr. *et al*. [2021]:

> "[...] although professional codes of ethics highlight important issues, they do not address specific situations faced by researchers in Computer Science. These codes of ethics, such as the ACM Code of Ethics [8] and the SBC Code of Ethics [9], focus on ethical issues that originally emerge from the practice of Computer Science professionals [10] [Singer, 2025]. Research ethics in Computing requires greater reflection and in-depth discussions, especially with regard to the training of researchers." [our translation]

Internationally, London [2022] provides philosophical depth with valuable terminology and case studies, while Resnik [2018] examines human participation through essential constructs like risks, benefits, and vulnerability.

Amorim *et al*. [2019] note that HCI studies communication phenomena between humans and computational systems, making human participation crucial. They emphasize that such research "treats individuals as subjects [...], may directly implicate ethical/legal issues, and can immediately impact participants". To mitigate risks, they recommend CEP/Conep system review prior to study initiation, while discussing submission challenges. Their work reveals resistance in Brazil's HCI community: half of surveyed authors had never submitted to a CEP, often considering Plataforma Brasil procedures non-mandatory due to perceived "bureaucratic review processes". Common rejection reasons included "incomplete documentation and missing risk or benefit disclosures".

Globally, as interactive technologies permeate modern life, HCI investigation practices have shifted: "The field's methodological and epistemological foundations are evolving to reflect diverse contexts of rapidly changing digital technology" [Frauenberger *et al*., 2017]. This introduces new ethical challenges, from redefining informed consent to ensuring privacy in ubiquitous computing. They describe ACM SIGCHI's (Special Interest Group on Computer–Human Interaction) Ethics Committee, established to evaluate practices and "address dilemmas transparently and consistently".

Several aforementioned authors collaborated internationally through SIGCHI venues to create forums for debating ethical challenges and developing evaluation guidelines Fiesler *et al*. [2022]. This remains an active discussion in HCI, both nationally and internationally, with progress yet to be made in awareness and practice, a gap this work seeks to address.

[8] Available at: `https://www.acm.org/code-of-ethics` [accessed 22-08-2025]

[9] Available at: `https://www.sbc.org.br/institucional-3/codigo-de-etica` [accessed 22-08-2025]

[10] For example: `https://www.edusp.com.br/livros/etica-em-computacao/` [accessed 22-08-2025]

4 Research Methodology

This work employs two research methodologies. First, it extends the meta-scientific analysis in Carvalho *et al*. [2022d] to examine ethical or moral dimensions in Brazilian Computing research, identifying characteristic phenomena and proposing targeted moral advancements. Secondarily, an artifact is proposed, as a pragmatic contribution of this research, to deal with the deficient or absent phenomena and behaviors discovered in the first part and by other diverse sources.

4.1 Phase one – secondary research

Specifically, we broaden the scope from the Brazilian Symposium on Human Factors in Computing Systems (IHC) to multiple other conferences organized by the Brazilian Computer Society (*Sociedade Brasileira de Computação* – SBC), such as the Brazilian Symposium on Multimedia and Web Systems (WebMedia) [Carvalho *et al*., 2022e], Brazilian Conference on Software: Theory and Practice (CBSoft) [Carvalho *et al*., 2024b], Workshops of the Brazilian Computer Society Congress (CSBC) [Carvalho *et al*., 2023a]

Our analysis covers main-track proceedings from 2013 – 2022, providing a decade-spanning panorama of how research ethics constructs and elements, e.g., CEP, TCLE; and human factors manifest across these venues. Limited to information relevant to this present work, the method adapts prior work [Carvalho *et al*., 2022e, 2024b, 2023a] through:

1. **Identification**. The proceedings of each event and each edition in the respective years were downloaded, ensuring greater quality in the search for terms.
2. **Wide screening**. The focus of these searches was not specifically human involvement in the publications, but rather the involvement of ethical or moral aspects. Thus, the identified phenomena and the perceived complexity arose from another research intention, consequently generating this one. The search terms were related to ethics and morals. In English, we search for "ethic", e.g., ethics, ethical; in Brazilian Portuguese, "etic", e.g., *eticamente, ético, ética*. We search for the homonym considering moral, equal in English, e.g., morally; or Brazilian Portuguese, e.g., *moralmente*, including *morais* (plural). We search for "consent" to encompass both English, e.g., consent, consent term, consent form; and Brazilian Portuguese, e.g., *consentido, consentiu, termo de consentimento, formulário de consentimento*.
3. **Narrow screening**. Qualitative analysis of the content found through the search terms and assessment of its relevance to the scope of the research. The research involved invited experts from each area to mitigate biases and conduct specialized knowledge in the area of ethics and morals. Considering the epistemological characteristics of each area, we cross-referenced the findings with the literature and discussed ethical or moral aspects.
   For certain areas outside the base researchers expertise, experts were invited to provide specific, conceptual, or

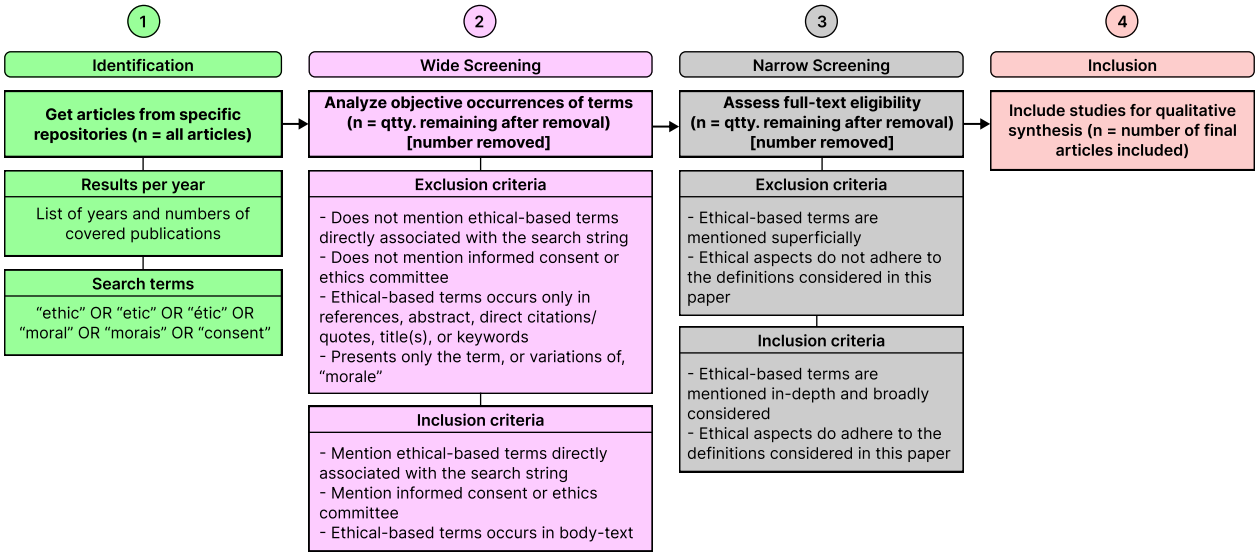

Figure 1. Method for each study, for each symposium

applied knowledge and to address ethical or moral aspects related to the practices of the respective area, potentially unfamiliar to the base researchers. In this context, these experts would elicit, analyze, and evaluate ethical or moral aspects from the perspective of their experience and practice in the field.

The areas and respective invited experts were: Human-Computer Interaction, Roberto Pereira; Informatics in Education, Isabela Gasparini; Software Engineering (and sub-areas), Thais Batista; Healthcare Informatics or Computing Applied to Healthcare and Games, Rosa Maria Costa; Software Quality, Monica Anastassiu and João Carlos Gonçalves; Information and Computer Systems Security, Lisandro Granville; Artificial or Computational Intelligence, Kate Revoredo; Collaborative Systems, Juliana França; Web, Multimedia, and Hypermedia, Maria da Graça Pimentel.

Each of these ten experts followed the protocol and interacted with it, as did the base researchers involved, and had the final say on the ethical or moral value of a given publication and its content.

4. **Inclusion**. Publications were included for analysis and synthesis, generating knowledge about the structured panorama of ethical or moral aspects.

The end of each paper included proposals for ethical or moral metascientific advances that could mature the ethical or moral climate or culture of those networks. This present paper is a direct pragmatic input to these proposals, presenting an initiative that aims at ethical or moral metascientific improvements in Brazilian Computing.

Figure 1 illustrates a generalized version of the method in each of the procedures conducted.

While prior studies treated CEP occurrences as secondary, this work centralizes their analysis. A key limitation is that none systematically examined human participation patterns, a gap for future meta-scientific research that could reveal additional phenomena.

4.2 Phase two – pragmatic research

The second phase addresses communicative and normative challenges in reporting human involvement. Following *Design Science Research* (DSR) methodology [Pimentel, 2017; Wieringa, 2014], we develop a textual framework, this research's pragmatical contribution, to standardize such reporting, enhancing communicative effectiveness, e.g., improving reproducibility through explicit human factor documentation. This publication concludes the first DSR cycle; future iterations will involve expert evaluations and target-user feedback.

DSR ensures both scientific rigor and pragmatic design [Pimentel, 2017; Wieringa, 2014], aligning with this study's transformative aims [Creswell and Creswell, 2018] to advance Brazil's Computing ethics landscape beyond its current arid state [Carvalho *et al*., 2022d]. Section 5.2 details the artifact's dual perspectives and research alignment.

4.3 Metascientific ethical and moral Aspects

As secondary research, this study is exempt from CEP submission requirements. No human participation occurs at this initial DSR stage, which precedes planned artifact validation in later phases.

Meta-scientific ethical considerations permeate this work, e.g., its underlying moral intentionality. Notably, an atypical ethical decision was made, we deliberately avoid citing specific publications with negative CEP/TCLE-related findings in Section 5.1.

Identifying problematic cases risks inflicting moral, social, or psychological harm on their authors. Given Brazil's arid research ethics landscape, revealed as incipient and immature, we emphasize systemic or structural patterns rather than individual instances. This approach acknowledges our inability to discern whether omissions stem from negligence or genuine knowledge gaps, presuming the latter predominates.

Table 2. Total number of publications analyzed in the systematic reviews (2013 – 2022).

Event	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
SBQS	34	29	30	32	29	39	38	45	32	35	**343**
SBSeg	24	22	23	31	34	40	39	40	31	31	**315**
SBES	17	18	21	16	42	38	67	104	62	53	**438**
SAST	X	X	X	15	11	10	9	12	7	8	**72**
SBCARS	14	11	14	16	12	11	13	16	11	10	**128**
WebMedia	104	57	53	103	140	97	136	87	63	46	**886**
SBCAS	24	15	33	23	39	28	65	80	67	59	**433**
ENIAC	63	97	47	65	84	82	93	65	72	70	**738**
BRACIS	43	72	57	86	74	96	149	90	77	89	**833**
STIL	39	X	35	X	31	X	53	X	51	X	**209**
LARS/SBR/WRE	28	45	65	58	75	99	86	66	63	76	**661**
SBSC	27	20	29	25	26	X	26	X	11	17	**181**
SBIE	109	152	140	147	201	229	203	184	117	125	**1607**
SBGames	144	185	166	226	211	251	198	156	190	160	**1887**
IHC	39	53	60	57	66	54	72	60	56	45	**562**
SBSI	80	63	100	80	79	71	76	47	56	49	**701**
SBLP	10	11	10	12	11	12	10	9	14	9	**108**
Total per year	**799**	**850**	**883**	**992**	**1165**	**1157**	**1333**	**1061**	**980**	**882**	**10102**
% per year	**7,9%**	**8,4%**	**8,7%**	**9,8%**	**11,5%**	**11,5%**	**13,2%**	**10,5%**	**9,7%**	**8,7%**	**100%**

Thus, we refrain from formulations like "[...] publications requiring CEP approval that lacked it *[indirect citations]*" or "*[Direct quote]* involved human participants without disclosing CEP/TCLE compliance". Our transformative intent prioritizes positive advancement over punitive exposure. By focusing on phenomena rather than actors, we encourage academic self-reflection and moral progress among researchers who may have previously overlooked these dimensions.

At the same time, we decided to omit one of the most valuable pieces of information in secondary research, a traceability table between the analyzed phenomena and their source Kitchenham *et al*. [2015], given the above justification. To the best of our ability, we attempted to generate solutions combining structured data presentation and respective sources anonymity. Ultimately, the proposed solutions resulted in a degree of traceability that was morally unacceptable to us.

The principle and scientific values of reproducibility are weakened, while the phenomena and objects relevant to the study are preserved. Furthermore, this decision enabled incisive and objective critical elaboration, free from social or emotional constraints. The information in Section 4 enables interested parts to rereproduce the research procedure, identifying publications omitted here. For this present work, the most important data (informed consent and ethics committee) is extracted during the wide screening stage, objectively and impartially, without the need for invited experts or qualitative interpretations.

5 Results and analysis

This section will detail the results of the first and second phases of the research, respectively.

5.1 Phase one – a landscape of human involvement in Brazilian computing research

This section presents a synthesized analysis from smaller-scale studies that collectively form this overview. Section 4.1 details the methodology and procedure used to achieve the results presented here.

From over 25 analyzed symposiums[11], including BRACIS and ENIAC [Carvalho *et al*., 2022a], IHC Carvalho *et al*. [2022d], SBR (including LARS and WRE) [Carvalho *et al*., 2022b], CBSOFT (SBES, SAST, SBCARS and SBLP) [Carvalho *et al*., 2024b], WebMedia [Carvalho *et al*., 2023c], SBIE [Carvalho *et al*., 2021d], SBSI [Carvalho *et al*., 2021e], SBGames [Carvalho *et al*., 2021f], SBQS [Carvalho *et al*., 2021c], SBSC [Carvalho *et al*., 2022c], CSBC [Carvalho *et al*., 2023a] and SBCAS (without respective publication, although analyzed). We examined 10102 publications from main tracks, identifying 1233 (≈12%) relevant occurrences through our search terms.

The tables in this section show the general quantities related to the occurrence of TCLE and CEP in the publications of each symposium analyzed. The overall analysis is done in conjunction with Table 6.

Initially, Table 2 presents the general quantity of publications analyzed, by year and overall. This table serves as a reference for comparison for the following tables in this section. Absolute values were chosen, instead of proportional ones, because the occurrence of CEP, TCLE or human involvement depends on the publications and research. Some values, when compared with knowledge areas and epistemologies, are indications for in-depth investigation. Without *a priori* categorical validation, they can lead to quantitative statements such as "should be higher" or "is low", case by case and event by event. For example, SBCAS in 2022 presents 59 publications, and no mention of TCLE or CEP.

[11] Symposium acronyms can be found at: `https://www.sbc.org.br/eventos/eventos-realizados` [accessed: 22-08-2025]

Table 3. CEP occurrences (without TCLE) in publications (2013 – 2022).

Event	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
SBQS	0	0	0	0	0	0	1	0	0	0	**1**
SBSeg	0	0	0	0	0	0	0	0	0	0	**0**
SBES	0	0	0	0	0	0	0	0	1	2	**3**
SAST	X	X	X	0	0	0	0	0	0	0	**0**
SBCARS	0	0	0	0	0	0	0	0	0	0	**0**
WebMedia	0	0	0	0	0	0	1	0	0	1	**2**
SBCAS	1	0	0	1	4	4	1	4	7	0	**22**
ENIAC	0	0	0	1	1	0	0	2	0	1	**5**
BRACIS	0	0	0	0	0	0	0	0	2	1	**3**
STIL	0	X	0	X	0	X	1	X	0	X	**1**
LARS/SBR/WRE	0	0	0	0	0	0	0	1	0	0	**1**
SBSC	0	0	0	0	0	X	0	X	0	0	**0**
SBIE	1	0	3	3	3	5	4	8	4	2	**33**
SBGames	1	3	1	1	0	3	2	5	6	7	**29**
IHC	0	1	1	1	1	5	5	8	6	3	**31**
SBSI	0	0	1	0	0	0	0	0	0	1	**2**
SBLP	0	0	0	0	0	0	0	0	0	0	**0**
Total per year	**3**	**4**	**6**	**7**	**9**	**17**	**15**	**28**	**26**	**18**	**133**
% per year	**0,4%**	**0,5%**	**0,7%**	**0,7%**	**0,8%**	**1,5%**	**1,1%**	**2,6%**	**2,7%**	**2,0%**	**1,3%**

Table 3 presents the occurrences of CEP, without mentioning TCLE. In several cases, approval by the CEP is stated without the presentation of the respective CAAE. For a research project to be approved by a CEP, the TCLE must be included. Therefore, it can be considered that the involvement of the TCLE is implicit when there is exclusive mention of the CEP.

Approval by a CEP is an ethical advance and institutional moral validation of the research, without configuring ethical or moral exhaustion of the purpose Carvalho *et al*. [2023b]. A research project may be approved by a CEP and maintain deficiencies or ethical gaps or even specific immoralities. Additionally, some ethical or moral aspects may exceed the CEP's assessment and present significant positive and relevant value for communication in a publication. Approval by a CEP is not a certificate of ethical perfection or moral exhaustion.

Table 4 presents the occurrences of TCLE, without CEP. While involvement with a CEP, from the preparation of the research project for submission to the final approval and assignment of a CAAE, can take months, and in the worst cases reported, up to a year or more; the TCLE is an independent document developed by researchers, with less bureaucracy and workload.

The TCLE and obtaining consent are two different elements; an in-depth analysis of this relationship can be found in ANPEd [2019]; Resnik [2018], which is absent in this work. The TCLE is the formal stage of negotiation and recording of consent. Obtaining consent may have been morally questionable, while the TCLE is syntactically and semantically adequate.

The TCLE is one of the basic and primary elements of the relationship between researcher, research and participant [ANPEd, 2019; Salganik, 2017]. Its development and dissemination are independent of CEP involvement, weighting a greater responsibility of the researchers.

In this work, we only analyze the TCLE superficially, emphasizing their presence or absence. Future work can deepen the panorama of these artifacts in published research, analyzing what is available and related data. For example, even if there is an TCLE involved, what is the quality of its content?

Table 5 presents the joint occurrences, where both TCLE and CEP are present. As mentioned above, when there is a CEP, there is implicitly a TCLE. However, it is appropriate to indicate the involvement of both, presenting both the CAAE for the approval of the CEP, and making the TCLE available in an external online repository or, in case of ample space available, in the appendix.

Table 6 presents the total occurrences, adding the categories of TCLE and without CEP, CEP and without TCLE and both TCLE and CEP.

The longitudinal analyses indicate an increase in the involvement of CEP and TCLE in research communications through publications. This is a positive aspect for Institutional Research Ethics, indicating greater appreciation and ethical and moral concern for the involvement of people in research.

The deepening of these data is content for future work, while the present work specifically emphasizes an subperspective. At the same time, these data provide a broad quantitative view of the maturation of the ethical climate, even if timid and slow, in the context of the scope of this research.

As critical notes that can be explicitly extracted, some symposia with a strong presence of research involving people in their epistemologies present excessively low values, compared to those expected. Such as SBES, dedicated to Software Engineering; SBSC, on Collaborative Systems; SBSI, on Information Systems; and the most alarming, SBCAS, in Computing and Health. On the other hand, IHC, SBGames and SBIE present the highest values, despite being proportionally low compared to totals, which we can conjecture

Table 4. TCLE occurrences (without CEP) in publications (2013 – 2022).

Event	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
SBQS	1	2	2	3	4	4	9	7	8	6	**46**
SBSeg	0	0	0	0	0	0	0	0	0	0	**0**
SBES	1	3	1	2	2	5	7	11	9	9	**50**
SAST	X	X	X	0	0	0	1	0	2	1	**4**
SBCARS	0	0	2	2	2	0	1	1	2	1	**11**
WebMedia	1	0	2	0	1	3	2	0	0	2	**11**
SBCAS	0	0	0	1	0	0	0	0	0	0	**1**
ENIAC	0	0	0	1	0	2	0	0	0	0	**3**
BRACIS	0	0	0	0	0	0	0	0	1	0	**1**
STIL	0	X	0	X	0	X	0	X	1	X	**1**
LARS/SBR/WRE	0	0	0	0	0	0	1	0	0	2	**3**
SBSC	1	2	0	3	3	X	0	X	2	3	**14**
SBIE	2	3	5	9	12	8	14	9	9	17	**88**
SBGames	7	4	5	8	5	14	9	8	4	6	**70**
IHC	7	10	8	12	13	17	15	15	7	8	**112**
SBSI	1	1	2	2	2	1	1	7	5	9	**31**
SBLP	0	0	0	0	0	0	0	0	0	0	**0**
Total per year	**21**	**25**	**27**	**43**	**44**	**54**	**60**	**58**	**50**	**64**	**446**
% per year	**2,6%**	**2,9%**	**3,1%**	**4,3%**	**3,8%**	**4,7%**	**4,5%**	**5,5%**	**5,1%**	**7,3%**	**36,2%**

Table 5. CEP + TCLE occurrences (both, simultaneously) in publications (2013 – 2022).

Event	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
SBQS	0	0	0	0	0	0	0	0	2	0	**2**
SBSeg	0	0	0	0	0	0	0	0	0	0	**0**
SBES	0	0	0	0	0	0	0	0	1	0	**1**
SAST	X	X	X	0	0	0	0	0	0	0	**0**
SBCARS	0	0	0	0	0	0	0	0	0	0	**0**
WebMedia	0	0	1	0	1	0	2	0	0	0	**4**
SBCAS	0	0	1	3	1	2	0	1	4	0	**12**
ENIAC	0	0	0	1	0	0	0	0	0	0	**1**
BRACIS	0	0	0	0	0	0	0	0	0	0	**0**
STIL	0	X	0	X	0	X	0	X	0	X	**0**
LARS/SBR/WRE	0	0	1	0	0	0	0	1	0	0	**2**
SBSC	0	0	0	0	0	X	0	X	0	0	**0**
SBIE	1	1	2	3	2	2	6	4	2	4	**27**
SBGames	0	1	2	2	1	6	4	7	6	3	**32**
IHC	1	0	0	2	6	1	8	8	7	8	**41**
SBSI	0	0	0	0	0	0	0	0	1	3	**4**
SBLP	0	0	0	0	0	0	0	0	0	0	**0**
Total per year	**2**	**2**	**7**	**11**	**11**	**11**	**20**	**21**	**23**	**18**	**126**
% per year	**0,3%**	**0,2%**	**0,8%**	**1,1%**	**0,9%**	**1,0%**	**1,5%**	**2,0%**	**2,3%**	**2,0%**	**1,2%**

mainly due to their interdisciplinary essence and inviting epistemic nature.

The textual framework proposed in this work can be potentially positive in awakening a maturation in these communities or networks with low occurrences, and promoting the advancement of others with higher rates.

Among these 1233 occurrences, 296 (≈24%) showed no human involvement. Notably, three publications had ambiguous descriptions making human participation uncertain. This leaves 936 occurrences with clear human involvement. The systematic protocol did not specifically emphasize research analyzing the involvement of people in them, but rather the ethical or moral aspects, through the keywords. In the set of not covered works (8869, ≈88%), there are several publications with research involving people without mentioning the key terms covered in this present work. Thus, without any mention of terms such as ethics, morals or consent. The absence of the term "consent" is alarming, being one of the basic elements of Research Ethics involving people [Brasil, 2016; Salganik, 2017] and indicating the TCLE absence.

Several publications exhibit inconsistencies and deficiencies in reporting human participation data. These issues can be quantitative or qualitative in categories, as presented below.

Quantitative data are presented as categories, e.g., "many", "few", "lesser"; since the exact quantity is secondary to the expression of the phenomenon. For example, "X publications (Y%) present photos of minors without due anonymiza-

Table 6. Only CEP and only TCLE and CEP + TCLE simultaneously in publications (2013 – 2022).

Event	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
SBQS	1	2	2	3	4	4	10	7	10	6	**49**
SBSeg	0	0	0	0	0	0	0	0	0	0	**0**
SBES	1	3	1	2	2	5	7	11	11	11	**54**
SAST	X	X	X	0	0	0	1	0	2	1	**4**
SBCARS	0	0	2	2	2	0	1	1	2	1	**11**
WebMedia	1	0	3	0	2	3	5	0	0	3	**17**
SBCAS	1	0	1	5	5	6	1	5	11	0	**35**
ENIAC	0	0	0	3	1	2	0	2	0	1	**9**
BRACIS	0	0	0	0	0	0	0	0	3	1	**4**
STIL	0	X	0	X	0	X	1	X	1	X	**2**
LARS/SBR/WRE	0	0	1	0	0	0	1	2	0	2	**6**
SBSC	1	2	0	3	3	X	0	X	2	3	**14**
SBIE	4	4	10	15	17	15	24	21	15	23	**148**
SBGames	8	8	8	11	6	23	15	20	16	16	**131**
IHC	8	11	9	15	20	23	28	31	20	19	**184**
SBSI	1	1	3	2	2	1	1	7	6	13	**37**
SBLP	0	0	0	0	0	0	0	0	0	0	**0**
Total per year	**26**	**31**	**40**	**61**	**64**	**82**	**95**	**107**	**99**	**100**	**705**
% per year	**3,3%**	**3,6%**	**4,5%**	**6,1%**	**5,5%**	**7,1%**	**7,1%**	**10,1%**	**10,1%**	**11,3%**	**7,0%**

tion" presents data that are inefficient for the transformative intention of this work, while the intention is to emphasize the phenomenon in order to mitigate it, avoid it or warn about it.

5.1.1 Quantitative Deficiencies

Missing participant counts are common, particularly for non-target groups. To a lesser extent, the number of primary participants who are the target audience of the research; to a greater extent, secondary and indirect participation, even if involved. For example, research in an educational environment involving children, whether they have disabilities or not, and caregivers, or teachers or observers, in which the number of children is specified and the number of other people involved is absent.

In some cases, the quantities are confusing or imprecise and vary according to the stages of the research, when there is more than one. In lesser cases where the research has more than one stage, the quantitative specification is unclear as to whether people from one stage participated in the other or in just one.

5.1.2 Erratic personal data treatment

People involved data are frequently absent, even when potentially affecting reproducibility (Table 1). Key descriptors like location, specific age ranges, or socioeconomic factors are often missing. While study specifics determine necessary detail levels.

In some cases, the omission or adapted communication of these data may be necessary, especially when there is a possibility of identification by reverse engineering the data or information. However, these cases are rare.

For example, in a study that deals with a rural community or a specific organization. Complete omission of data prevents the findings or results of the research from being compared with other rural communities or organizations. Even if specific identifiers are not presented, secondary or indirect data aid scientific communication.

In some cases, publications only present which demographic data were collected, without announcing additional quantities or specifications. For example, announcing the collection of age, level of education and skin color or race; without announcing how many people of each age, level of education or skin color or race were involved in the final synthesis of the research. Even without announcing the complete data by participants, directly associating each one with the respective personal data; but only grouping them into separate sets.

Additionally to data under-presentation, an analogous phenomenon occurs, that of data over-presentation. Photos or images of people involved in the research are exposed without any contextual need with the scientific writing or argumentation. For example, photographing an interview and exposing it in the publication just to announce that there was an interview, exposing participants.

In very few cases, less than 1% of the 1233 studies analyzed, was authorization of image rights mentioned. Even with mechanisms that aim to prevent direct identification, such as blurring the faces of participants, the transfer of image rights is still necessary. In the case of vulnerable participants, such as minors, it is the guardians who grant this permission.

In the most critical cases, the explicit identities of vulnerable people are exposed, such as minors or the elderly. In some of these cases, in this same pattern of unnecessary exposure. Among the publications analyzed, this behavior was more common in SBIE, with minors.

Some data collections are questionable in processing-related intentions. For example, collecting sensitive data such as sexual orientation or skin color or race, without this data being used for anything in the respective research. Although the Brazilian LGPD (*Lei Geral de Proteção de Dados* – General Data Protection Law) presents flexibility when it

comes to the processing of personal data in research [Brasil, 2018], the researcher's moral responsibility towards the participants remains, as well as technical methodological competence regarding responsibility in the processing of data in the respective research.

5.1.3 Textual problems

Four types of problems are recurrent in the writing category, making up textual deficiencies.

First, **terminology misuse**. Some studies ambiguously describe CEP involvement as "consent" or "permission" rather than formal approval. These terms occur in greater quantity when there is approval and the CAAE is absent and, in lesser quantity, when there is approval and the CAAE is present.

In this regard, this criterion may be perceived by some as banality or grammatical preciosity, mainly due to the informal culture regarding dominant ethical or moral aspects. However, the plurality of terms may generate discursive confusion about the relationship between the CEP and the researchers.

Due to mandatory normative involvement, the CEP may reject the research project or request successive revisions. Even so, it is not up to the CEP, alone, to "permit" or "consent" the research to proceed or not, because this is an existential freedom of the researchers. Approval indicates that the research was validated by a collective instance of the CEP/Conep system, a CEP, adapting it to the dominant normative moral conformity of Brazilian research. In practice, ethical scrutiny and conduct still depend on the researchers [Carvalho *et al*., 2023b].

At the end of the process, so that research involving people is being adequately and morally communicated, the only term that indicates CEP involvement is approval or exemption from involvement, with due justification [Carvalho *et al*., 2023b].

Second, **missing citations**, as most fail to reference official CNS resolutions, No. 466/2012 [Brasil, 2012] or No. 510/2016 [Brasil, 2016]. And third, present **vague compliance claims**, as authors state following regulations without specifying which or providing references. Both are serious scientific writing flaws [Marconi and Lakatos, 2017; Wazlawick, 2014].

This problem follows the culture of trivializing the communication of ethical or moral aspects. In certain cases, elements present in the next resolutions are included, e.g., "we offer participants the option to withdraw from the research at any time" or "we indicate to participants that participation is optional and that they can refuse to participate without any cost or prejudice". Although correct and valid statements, they are fundamental and superficial bases by the resolutions. By mentioning the CNS resolutions, these behaviors are implicit and already expected.

The third phenomenon follows the previous one, aggravated by the fact that any citations or references are absent, e.g., "this work follows pertinent ethical considerations". Although in smaller quantities compared to the previous one, it occurs in a strangely high quantity for publication spaces that offer peer review.

As a basic foundation of scientific writing, objective statements must be accompanied by sources, in citation and reference format [Wazlawick, 2014]. When communicating about the epistemology of the research, it must present a basis. Considering the sentence "this work follows pertinent ethical considerations" and considering the missing sources, what are these considerations? Where do they come from? They are solid? What measures were followed? Were any of these considerations not necessary in this specific work? Does this work potentially present new considerations?

Assuming a simple case, the sentence "this work follows pertinent ethical considerations" presents as sources the CNS resolutions. Both reviewers and those to whom this work communicates will be able to verify and validate these "ethical considerations" in the research method and protocol. Additionally, it facilitates the reproducibility, as in Section 2.2, of ethical or moral aspects.

Lastly, **outdated references**. Some cite superseded resolutions, e.g., 196/1996 [Brasil, 1996] instead of 466/2012 [Brasil, 2012]. This problem presents very few occurrences, indicating a lack of normative updating or negligence regarding the quality of citations and references.

Finally, we speculate a potential problem through the results of this research, which requires future research for its respective validation. The resolutions, foundations and bases for ethical decision-making are cited without having been read or effectively known.

Even in the absence of bad faith intent, it is possible for researchers to cite elements without having read or effectively learned that information. Therefore, they only informally and conveniently mention what or how far they know, and add a citation as a necessity for scientific writing. In a behavior of "including this text to demonstrate that I care about this" or even because it is the only part of the limited knowledge they have. And since there is a culture of trivializing the communication of ethical or moral aspects, this text will go unnoticed.

Although it is common in academic-scientific culture to mention or cite information based on a superficial or intuitive notion of related knowledge, when it comes to ethical or moral aspects involving people, other risks are considered. When people are involved in the research practice and researchers do not actually know or understand ethical or moral aspects for research involving people, there is a risk of harm or loss to these people, even in the absence of bad faith or intent and with low probability.

Considering research as the professional practice of the researcher, it is the researcher responsibility, and of other researchers involved, to know and understand the ethical or moral aspects related to their doings. That is, to mitigate their ignorance and avoid claiming it for convenience. Aggravated when it involves third parties, people necessary and important to their role and who freely, consciously and clearly accept to contribute and participate in their work, in good faith and willingly, potentially unaware of the possible risks, harm or losses.

5.1.4 Selective or erroneous interpretation

A significantly low number **mention CEP, or related terms, and act erroneously or partially**. For example, the 510/2016 resolution [Brasil, 2016] announces the exemption from registration for: "*activity carried out exclusively for the purpose of education, teaching or training* without the purpose of scientific research, of undergraduate students, technical students, or professionals in specialization", and in the communication the authors make an excerpt from this text and only present a convenient excerpt (the part stylized in italic marking), which guarantees them moral validity in the respective practice, or lead the interpretation to their bias of moral favor, i.e., "if it is written this way, therefore, I perceived this decision-making as morally valid".

A traditional case of selective interpretation are dynamics conducted in the classroom with pedagogical intention and that, only later, become scientific research and communications.

Although we found cases of erroneous or selective interpretations in five or fewer publications, it is worth noting that the protocol that gave rise to this work does **not** emphasize an in-depth study of the aspects of people's involvement in research, but rather the ethical or moral aspects. Therefore, in the "blue ocean" of not covered publications (8869, ≈88%), this phenomenon may be worse and input for future work deepening it.

5.1.5 Opinion research misclassifications

Confusing anonymization with opinion research figures in many cases. Since the resolutions exempt opinion polls from submission and approval by a CEP, some people interpret their practice of involving people with a bias towards moral validation, and this occurs mostly when anonymization is involved. There is a perception that, if personal data is not requested or if it is requested and then anonymized, this is classified as opinion polls, which is wrong. It is recommended that the CEP initially be involved as a precaution, at least to verify the adequacy of the survey, for future similar instances.

We refrain from delving into this specific topic, given its complexity and importance, which deserves its own communication. This work reinforces the perceptions of several others [ANPEd, 2019; Carvalho *et al*., 2023b; Salganik, 2017; Resnik, 2018]: we are ethically and morally incomplete and limited, and by involving other people in ethical decision-making, especially those specialized and dedicated to this task, we complement and improve these decisions. This perception is imperative when decision-making involves other people, and may result in damages or losses that our limitations or ignorance prevent us from perceiving.

5.1.6 Terminological inaccuracies

In fewer than three instances, **the term *Institutional Review Board* (IRB) was misused**. While IRBs are the United States of America's equivalent to Brazil's CEP system, this terminology is incorrect and inappropriate for the CEP/Conep system.

This problem hinders scientific communication because interested parties may seek the involvement of a CEP in the text through search tools or systematic reviews and not find it. The work was approved by a CEP, which was appointed as IRB.

As previously reported [Carvalho *et al*., 2022d], **TCLE appears under multiple names**, e.g., "permission forms", "authorization records". Although full title errors remain rare, e.g., "*termo de responsabilidade livre e consentido*" .

5.1.7 Transparency gaps

Outside the bureaucratic moral scope and as an element of open science for a better scientific ethical climate, **few occurrences of availability and transparency of TCLE**. This practice allows for metascientific investigation of the research ethical parameters and makes it easier for interested parties to replicate the document content and ethical or moral intention. For example, does an TCLE involving elderly people with Alzheimer's need anything specific? Or with incarcerated people? Or with hackers? One way of ethical advancement is through other concrete examples [Zagzebski, 2017], including scientific practice.

Another deficiency in transparency is the informality or negligence related to ethical or moral aspects in the texts. In this specific case, we find three scenarios: (i) the research presents relevant and significant ethical or moral aspects and researchers communicate this in the text; (ii) the research presents relevant and significant ethical or moral aspects and researchers do not communicate this in the text; (iii) the research presents little significant or relevant ethical or moral aspects and researchers do not communicate this in the text.

- **Little relevant ethical or moral aspects that were NOT communicated** - Beginning with the third case (iii). Objectively, this is the simplest case, and ethical or moral considerations can be limited to external citations, a brief paragraph, or omission. However, with the culture of trivializing ethical or moral aspects, there is a risk that researchers themselves perceive relevant or significant elements as their opposite. That is, ignorant of their value. The authors of this present work, through their social interactions and experiences in computing communities, routinely notice cases like this, e.g., the research involved CEP and was approved, but the authors omitted this content from the text. When questioned about this, they respond that they did not know about its importance or that "they were instructed to omit this information to save space for more important content". Although this is an isolated case of anecdotal evidence, it is real, and has been validated in other social interactions.
- **Relevant ethical or moral aspects that were communicated** - In terms of ethical or moral aspects, the first case (i) is the most enriching on this topic, even though certain communications do not require, or require little, communication on this subject [12]. In most of these

[12] One of the concerns perceived through social interactions with other researchers is the excessive communication of supposed extrapolated ethical or moral aspects, the result of a supposedly "radical advanced ethical cul-

cases, it is scattered and without any structure, or even confusing in some cases. Content on ethical or moral aspects, whether about the respective research or its applications, consequences or implications; are "lost" in the text. Sometimes, without being labeled as such. We find this content due to its textual proximity to the searched terms or keywords.

This phenomenon is perceived as one of the most complex challenges in the current panorama of ethical or moral aspects in computer research in Brazil [Rodrigues *et al*., 2021], complemented by the results of this present research. Several researchers are not even able to perceive what qualifies as an ethical or moral aspect or not, conjecturing mainly due to ignorance and lack of education.

It can be objectively recommended that publications present sections for ethical or moral aspects, which is seen in few of the publications analyzed. However, what should be included in this section? This question is preceded by another: is there training or knowledge to fill these sections with semantically valid content for the same? Therefore, this is a complex problem. Although this present work advances the challenge of communicating ethical or moral aspects about human involvement in research, this wide gap remains open for a more mature and advanced ethical climate.

- **Relevant ethical or moral aspects that were NOT communicated** - Finally, the second case (ii). Since this is a case of absence, extensive speculation is avoided. Through the publications, it is impossible to perceive what should be contained in them, beyond the normative institutional ethics, e.g., CEP and TCLE when there is human involvement.

  Therefore, some possible positions can be discussed. First, ignorance or lack of education leads researchers to simply not know what to include in this topic; second, trivialization leads to a value judgment of content in which "anything is more important than this. But, if we have space left, include it"; third, objective devaluation or negligence that leads to omitting this content in a deliberate, conscious and rational way, i.e., "I know what type of content this is and I am not going to include it in the text because it is inappropriate or nonsense for this type of communication, or not adequate for a computing text".

  These aforementioned scenario hypotheses directly affect this research. If communication about ethical or moral aspects is undervalued, neglected, devalued or "left aside in comparison with anything else", the artifact proposed here will follow the same fate. In scenarios two and three, the textual framework proposed here will follow this negative valuation and will be left aside, even if necessary.

ture". Since this culture does not currently exist in an explicit and structured manner, this moralistic hypothesis borders in absurd. However, objectively, a rational and considered assessment of the quality of this communication is necessary, whether if it is appropriate or not. Today, this agenda is close to null, although communicating anything for empty moralistic reasons does not guarantee ethical or moral maturity or progress.

5.1.8 Assent form neglect

A **neglected element is the Free and Informed Consent Form (*Termo de Assentimento Livre e Esclarecido* – TALE)** [Brasil, 2016]. The TALE is intended for children, adolescents or individuals temporarily or not prevented from consenting, adapted for their understanding, without disregarding the TCLE for the consent of legal guardians.

In this case, the significant amount of research did not apply a TALE to the target and necessary audience, and another part applies TCLE to guardians and omits the TALE. As indicated in Article 28 [Brasil, 2016], conducting the Free and Informed Consent and Assent process is an indeclinable and non-delegable responsibility.

Such as in Section 5.1.7 and specifically regarding TALE, we did not find any documents being made available. If an external address was indicated, it was inaccessible. Although the TCLE is a well-established document in the Research Ethics paradigm [Brasil, 2016; ANPEd, 2019; Salganik, 2017], TALE is not. And the availability and sharing of TALEs can improve the quality of these artifacts for obtaining assent, through real examples.

5.1.9 Participant definition challenges and ambiguities

An emblematic case, which arouses analytical disagreement, including among CEPs or experts on the subject, is the answer to the question **"what is actually a person involved or participant in the research?"**. In some cases, it is possible to find two groups of involvement, the target audience for which the research is intended and experts or indirect related people.

For example, developing a study on an app for young children to learn mathematics. The target audience is young children and the final research primarily involves them. However, the research also involves experts in mathematics, designers, programmers, graphic artists, early childhood education teachers who work with children, among others. Are these research experts or indirect related people considered participants in the research?

Starting with the indirect involvement of people. It is necessary to analyze whether the phenomena or constructs of reality to be studied through the scientific method or procedure involve the interactions or data of these people. As these are relatively complex cases, the analysis will be based on factual cases present in the publications analyzed.

Case 1: The analysis involves minors, however, guardians must sign a consent form and can watch the dynamics of the research procedure in action. Minors are directly involved, and their guardians are indirectly involved.

If guardians intervene in the research practice, this is still not a sufficient condition for them to be considered directly involved, e.g., asking to suspend or terminate the ongoing research. Even so, if this intervention action is investigated or deepened in the research, these people become directly involved.

Case 2: A public and open event exhibits a game and this game is openly displayed for anyone who wants to play, with the home screen repeating indefinitely. The intention is for people to play and fill out a form placed next to the equipment

at the end of each interaction. The consent form is on the home screen, before the actual game starts.

People who pass by, observe, sketch facial expressions, take photos, interact as they prefer, among others, are indirectly involved in the research. So even if researchers observe players from afar and communicate interactions through indirect involvement, a consent form or CEP is not necessary. For example, "X people laughed" or "one person took a photo, invited others to watch, and none of them played".

At the same time, none of these communications can or should present any personal data of the people indirectly involved that allow identification or identifiability. For example, the game is about racism and features black characters. The observing researcher can analyze the skin color or race of the people who fixed their attention on the screen. For example, "27% more non-white people stopped and observed the game screen for more than 10 seconds, compared to white people. Even if none of them played the game". The researcher's subjective analysis of the race or skin color of the people analyzed is considered.

Case 3: Women computer specialists are interviewed for a study on gender discrimination phenomena in their field of activity. These women are the people directly involved. They are exposed to the TCLE, the research project was approved by a CEP.

If some of these women mention other people, e.g., who committed the act of discrimination; these people are indirectly involved in the research. Unlike cases 1 and 2, this is a sensitive involvement. Exposing the identity of the people mentioned is immoral, since they did not consent or authorize it. At most, identifiable elements relevant to the research that do not allow reverse identification can be exposed. For example, if the discrimination came from men or women.

The detailing or extension of the analysis on the indirect involvement of this person makes them directly involved, since their experience becomes the object of the study. Therefore, the way in which the research relates to this person changes and becomes ethically non-trivial.

We will limit ourselves to these three cases, for an initial overview of this topic complexity exposure. Following, If the involvement of these people is restricted to their specialty and professional activity, without being part of the analysis or study, this person is considered an expert judge and their involvement does not require involvement with a CEP. In the event of any discrepancies in this involvement, it is recommended to involve a CEP.

In the case of the involvement of specialized people, the investigation or scientific research does not involve the participation of these people directly. Their involvement is limited to their professional performance and specialized knowledge.

For example, when a researcher intends to develop a computational solution to analyze a certain behavior of a group of people directly involved. The external developers of this computational solution are not the scope of the analysis, and their involvement is limited to their technical expertise and performance.

An erroneous example taken from the publications analyzed: a group of researchers develops a mobile application to teach children about health issues. The group of people directly involved are the children. The researchers themselves develop the computational solution in question. Before carrying out the research with the children, as is the next step in the procedure, they present the computational solution for experts to analyze. In this case, they are experts in the Health studies, who will validate the quality of the content in this domain.

However, for this, the researchers involve students of a technical course in the Health studies, in the initial stages of the course. They form the "experts" who evaluate the computational solution. Furthermore, some opinion of these students was recorded and included in the publication. This is a case of serious misconduct, because the involvement of these students, some of whom were minors, did not demonstrate the involvement of the CEP. It was announced that the CEP would only be involved for children directly involved in the analyses with the mobile application. This application was reviewed and evaluated by non-specialists.

In this case, the expert person must be socially and institutionally recognized as such, e.g., it should be a doctor in the respective specialty, a specialized nurse, a biomedical scientist with a high degree of qualification, among others. And the involvement is strictly technical and instrumental. If this involvement is investigated as part of the research, it becomes primary and needs to be treated as such.

Without configuring a syntactic problem and intersecting with Section 5.1.6, as a negative aspect some mentions of participants as "subjects" or "samples" are perceived. These are nomenclatures that dehumanize the participating people, who can be named as "participants" or "people involved", or as "humans" for a classic scientific writing.

5.1.10 Participant data in computer systems and social networks

Finally, another gray area concerns **data present in social networks or other computer systems that store personal data**, identified or identifiable, or copyright data [Carvalho *et al*., 2021b]. These are not trivial public or open data. When researchers collected the data, people were not aware that they would be used for academic-scientific or similar research, i.e., they freely and clearly consented to the limited purpose of that specific system and not to involvement in research [Bioni, 2019; Hallinan *et al*., 2020]. We call this involvement as passive and indirect.

There is no direct and objective resolution on this point, while some interpret them as public data, because they are configured as public by the people producing it, and others as inadequate data, according to the explanation mentioned above. Arguments appealing to exemption and arguments defending the CEP involvement in this category of research are found, both accepted and formally published by the communities.

However, any category of passive and indirect involvement that presents sensitive or potentially harmful or damaging data categorically requires an CEP involvement. For example, medical records, health conditions on dating apps, data likely to cause harm, e.g., moral or physical, to the people involved, compromising data, among others. In this case,

the maturity and analytical rationality of the researcher related to the person involved is needed. It is recommended that the CEP be involved as a rule and not as an exception when it comes to involving people, especially when the target audience involves vulnerable people or sensitive data.

5.2 Phase two – a textual framework for communicating people's involvement in research

Initially, the quality of communication and how human involvement is addressed represents, even if indirectly, an aspect of respect and appreciation for the involved participants. Building upon this starting point and considering the requirements in Table 1, proper valuation and effective communication of this data category becomes valuable.

A literature review, including gray literature, reveals a specific deficiency in the precise topic of how to communicate the human aspects or factors of participant involvement in Computing research. This differs from the topic of applied research ethics involving human participants, where the former would constitute a sub-topic of the latter. Section 5.1 demonstrates the need for improvements in this deficient and non-trivially complex context.

A systematic literature review or mapping study specifically focused on this sub-topic represents potential future work that could complement the artifact in a future DSR cycle, with a formative character [Wieringa, 2014]. The critical and emergent situation presented in Section 5.1 triggered this initial research, motivated by the intention to mitigate or resolve various negative or deficient phenomena, already constituting significant moral progress as a first step.

For this artifact, a set of direct and indirect references related to communicating human involvement or participation in scientific research are considered [Enago Academy, 2019; National Research Authority, 2023; Devlin, 2006; Riley *et al*., 2010]. During content analysis, we identified documents and texts from outside the computing context; however, their content was analyzed as pertinent and generalizable to Computing. Simultaneously, some of the textual requirements proposed here are based on counter-examples from Section 5.1, as well as content provided by Brazil's CNS, the CEP/Conep system, and other interested institutions or organizations.

An initial concern may emerge regarding this proposal's complexity and its relevance to Computing. The phenomena and behaviors presented so far indicate that communicating human aspects in computing research is non-trivial, following characteristics that surface in the epistemological engineering of this proposal. A primary complexity lies in achieving high-level abstraction that encompasses most potential research involving human participants. Furthermore, advancing meta-scientific quality in computing research communication contributes significantly to the field, particularly when considering common characteristics of computing research. Ultimately, we must recognize that languages and linguistic elements are social technologies [Dascal, 2002], meaning they inherently possess technical and technological aspects.

A key advantage of this artifact lies in simplifying and standardizing its primary purpose, it reduces cognitive load in learning how to report human participation while allowing researchers to redirect attention, effort, and time to other communication aspects. At an advanced level, the required effort involves adapting the framework for non-standard cases, which when properly structured and documented could extend and enhance this artifact's technical capabilities.

This textual framework comprises both recommended and mandatory elements. The mandatory components reflect coercive moral demands established through resolutions like those from Brazil's CNS and CEP/Conep system [Brasil, 2012, 2016].

Ultimately, positively valuing and practically working toward higher-quality communication of human involvement stems from ethical decision-making [Vázquez, 2018; Lazar *et al*., 2017]. Malicious use of this artifact or willful ignorance of it despite knowing its communicative benefits constitute ethical choices.

While quality requirements and resolutions are objectively determined, current Computing practice presents minimal consequences for ignoring them. Even when academic venues reject publications lacking proper ethical considerations for human involvement, whether in practice or textual communications, such cases remain rare. Therefore, positive appreciation and practical application represent political decisions toward moral progress. Ignoring moral determinations may incur little penalty, but embracing them creates counter-momentum that devalues non-compliance. For instance, researchers might avoid venues enforcing ethical rigor, but as this culture grows, more venues will adopt such standards, a collective effort this artifact indirectly supports.

Still in preliminary stages, we present a simplified overview of requirements, dedicating more attention to the artifact's functional and non-functional specifications that demonstrate its utility. The underlying need is thoroughly established in Section 5.1. The artifact proposed here is a prototype, a sketch that will be investigated and advanced as the pragmatic formative research progresses. Even so, its use, as it is found here, is already an ethical communicational advance when compared to a non-existent or chaotic structure.

5.2.1 The Textual Framework for Communicating Human Involvement

The artifact's first challenge presents an ethically complex recommendation regarding allocated space. Existing guidelines show conflicting approaches: some advocate sufficient space to properly address this complexity, while others recommend minimal plausible space. In Computing, the latter dominates culturally. Specifying one to two pages for human involvement communication contradicts this norm, though the common single-paragraph approach proves insufficient.

Two distinct elements emerge: syntax and semantics. Syntactically, this framework resembles a form or checklist. Design requirements suggest better communication quality comes through spacing and graphical styling [von Engelhardt *et al*., 1996], though space constraints often prevent this. We therefore recommend: (i) Using mandatory elements (and recommended ones when critically needed) condensed into

paragraph form or; (ii) when space permits, presenting components as an itemized list with maximal elements.

Semantically, content must remain complete, valid, and necessary through simple, objective language [Cappelli *et al*., 2021], priorities even within space limitations.

Computing's publication culture emphasizes technical elements, e.g., specifications, models, algorithms. Yet human involvement demands comparable rigor. Even less valued, it requires baseline quality standards. As noted, proper communication indirectly demonstrates respect for participants.

Addressing these space and cultural challenges, we present the framework's core components[13]:

1. **[OPTIONAL]** *Initially planned involvement*: This item includes data about the preliminary planning of human involvement. It is strongly recommended when there is a discrepancy between the planned and actual involvement in the research implementation, depending on the degree of variation at the researchers' discretion. This may relate to either the quantity or quality of involvement.
   Example 1: developing a computational solution for visually impaired individuals. The planned involvement concerned people with visual impairments, with a small expected quantity. However, during research implementation, due to factors beyond control, testing was conducted with sighted individuals but using elements that limited or blocked their vision. This is a case where the anticipated quality of human involvement had significant variation, impacting the research remainder.
   Example 2: the plan was to involve at least 100 children in the educational environment research. However, during implementation, only half of the guardians returned the TCLE (Informed Consent Form) authorizing participation. As a result, the research was conducted with 52 children who provided assent through TALE (Assent Form). This is a case where the anticipated quantity of human involvement varied significantly, impacting the remainder of the research;
2. **[MANDATORY]** *Involvement type*: Involvement can be active, passive, direct, or indirect. In active involvement, the person participates actively in the research, e.g., answering questionnaires, participating in interviews, being observed and aware of it, among others. In passive involvement, the person participates unaware of it, e.g., being observed unknowingly, through recordings where they are present, or when their data is used (identified, identifiable, or otherwise).
   In direct involvement, what the person does has a direct relationship with the research, its results or contributions. In indirect involvement, intuitively, the relationship is indirect. Direct involvement is obvious through traditional research practices. Examples of indirect involvement include: annotators who participate in Artificial Intelligence (AI) training, and the research result is the respective AI model; caregivers who assist elderly individuals in using computational technologies together with researchers, and the research result is the elderly individuals' interaction; or experts who assist in engineering or conceptualizing some practical solution, and the research result is the artifact, not the specialized knowledge.
   While all direct involvement requires full consideration and scrutiny of the prevailing morality of Research Ethics involving people, indirect involvement needs to be analyzed on a case-by-case basis. For example, consider the involvement of an expert. Researchers are developing a game to raise awareness about traffic accidents, and a designer is involved in creating the artwork. However, the potential designer lost a loved one in a traffic accident, and the involvement in the project could have significant negative impacts. Even if this person is an indirect participant, in the role of an expert, their involvement in the research remains the researchers responsibility.
   The involvement can be a combination of the first two types with the last two, and may differ and vary among involved individuals or groups. This item may appear in a different position in the framework ordering. It is adequate in this position when there is only one type of involvement;
3. **[MANDATORY]** *Total count*: The total count is the sum of **all** individuals involved. It is important to emphasize that this item includes **all** participants, as it was observed that many publications only report what is called the "target population". As in item 2, this count should include: domain experts, annotators in supervised learning, caregivers, teachers, assistants, among others.
   However, this item should only include individuals directly involved in the **research**. For example, janitorial staff in computer laboratories are essential for maintaining infrastructure and enabling research to occur in sanitary, hygienic and healthy conditions. Nevertheless, their relationship to the research itself is sufficiently distant that they should not be counted as research participants.
   Other examples of individuals not considered participants solely by their primary role include: producers and funders, academic advisors, family members, lab colleagues, companies providing "free" computational services;
4. **[RECOMMENDED (RESEARCH-DEPENDENT)]** *Specific counts*: This item specifies separate quantities divided by different profiles. Only the quantities and their groupings should be included here, e.g., one domain expert, three individuals implementing the artifact, twenty children using the artifact;
5. **[RECOMMENDED (RESEARCH-DEPENDENT)]** *Experts or judges*: This item specifies the experts, also called judges, involved in the research due to their technical, instrumental, and specialized participation. The involvement of experts does not require engagement with a Research Ethics Committee (CEP) for the research or its respective stage.
   Experts are individuals with proven and socially recognized levels of experience and knowledge. Their involvement is specific and justified by technical or particular needs, and this participation is limited to their con-

[13] Examples derive from actual cases in Section 5.1's secondary research.

strained interaction within this context, excluding any analysis of the phenomena under study. When any examination or investigation about their involvement occurs beyond specialized consultation, CEP oversight becomes necessary.
Taking the nurse expert example above, if conflicts of interest emerge in her work progression or issues arise incidentally (e.g., disagreements with researchers), none of these circumstances should be part of the research investigation. If incorporated, the nurse's role transitions from expert consultant to research subject, requiring CEP review;

6. **[MANDATORY]** *Research Ethics Committee – **Comitê de Ética em Pesquisa***: This item must indicate either the CAAE, the ethics approval document, or the exemption status. This pertains to the moral dimension. From an ethical standpoint, other phenomena concretely occur through immoral or erroneous practices. This does not necessarily imply unethical, negative, or bad-faith conduct. Currently, in Brazilian Computing research practice, many studies are conducted without CEP involvement for various reasons. In most cases, few of these reasons are negative.
Therefore, it is recommended that this item also include an indication of **non**-involvement of the CEP. This non-involvement declaration should complement the response in this same item. Indicating non-involvement is not a justification, validation, example, or endorsement of **not** submitting to the CEP; rather, it represents an honest response to the research's normative situation.
Furthermore, this information allows reviewers or evaluators to consider the complete scenario, including the non-involvement of the CEP and its justification. Reviewers can then assess the validity of the argumentation, gradually moving toward full moral compliance where only CEP-approved research is accepted.
This represents a critical and significantly negative aspect of the current landscape [Carvalho *et al.*, 2022d]. When submissions are sent to academic-scientific venues, a moral lottery phenomenon occurs. If assigned to a reviewer who values CEP involvement and none exists, the submission may be rejected. If assigned to a reviewer who presents an negative or neutral position about CEP involvement, it may be accepted or evaluated leniently. Ultimately, regardless of direct academic-scientific merit, this factor becomes a "Russian roulette" based on the moral compass of reviewers or evaluators;
7. **[OPTIONAL]** *CEP experience*: This item provides testimony from the authors about their specific experience with the research ethics committee regarding their project, e.g., duration between submission and approval, unusual revision requests, challenges in understanding CEP requirements, among others.
8. **[MANDATORY]** *TCLE/TALE*: This item must objectively indicate either the use of an TCLE or TALE, or declare an exemption. Exempted cases can be found at resolution No. 510/2016 [Brasil, 2016].
9. **[OPTIONAL]** *TCLE/TALE specifications*: This item should describe any non-standard aspects of the TCLE/TALE beyond resolution requirements, e.g., oral presentation of TCLE for illiterate participants, audio-recorded consent for individuals with motor impairments, among others.
The TALE is equally important as the TCLE and, when required, should be specified with equal rigor.
10. **[OPTIONAL]** *TCLE/TALE availability*: Include the electronic or physical address where the document is available.
Making ICF/IAF available advances Open Science, facilitating peer reuse, serving as template examples, enabling quality verification for formative improvements, enhancing future research compatibility (see Table 1), among other benefits.
11. **[MANDATORY]** *Nature of involvement*: Briefly describe how each participant group are research-related. Did children use an application? Did elderly participants use social media? Did participants interact with specific hardware?
12. **[RECOMMENDED (RESEARCH-DEPENDENT)]** *Involvement duration*: Required when research extends beyond a single atomic event, e.g., online surveys, interviews, game play sessions, among others.
Specify Which participant groups perform which tasks and for how long, e.g., smartwatch data collection for one week, child observation across multiple classes, undergraduate software modeling analysis during five 2-hour sessions, week-long data collection from participants, among others.
13. **[RECOMMENDED (RESEARCH-DEPENDENT)]** *Potential risks or harms*: This item should be completed with non-trivial elements. Returning to item 1, if people are blindfolded to test the computational solution, they might fall. If researchers ask women whether they have suffered gender violence or discrimination during their educational path in Computing, this may awaken negative or traumatic memories. If medical exam images are used for computer vision and there is a probability that people could be identified during data sharing. These are uncommon risks in computing research;
14. **[RECOMMENDED (DEPENDS ON RESEARCH)]** *Extra-scientific laws and regulations*: This item is completed with which objective moral norms interact with the research and influence human involvement. For example, does the LGPD relate to the data of involved persons? How does it relate to this type of involvement?
15. **[OPTIONAL]** *Additional ethical or moral considerations*: This is a comprehensive item that encompasses various possible situations beyond the other items.
Some possible examples are: unusual unforeseen events, such as researchers working with elderly people who pass away during some research stage, between meetings; financial aspects, if there is any unexpected cost or expense, such as a reimbursement that the involved person themselves requested; ethical or moral care beyond what is determined in objective or extraordinary norms, such as research conducted in classrooms where it is recognized that the student-teacher relationship presents an unbalanced power and influence dy-

namic and this is considered when involving students; if any involved person has an accident or gets hurt outside of expected risks or harms, which is particularly important for possible cases of replicability or reproducibility. These are cases so specific and punctual that they escape previous categories;

16. **[MANDATORY]** *Special profile types*: If none exist, state "none". Otherwise, indicate any deviant or special attributes/characteristics. Examples include: minors, people with disabilities, individuals with special psychological or mental conditions, incarcerated persons, indigenous people, specific communities, among others.
    This item's content may emerge accidentally. For instance: during participant recruitment for interviews, one reveals advanced autism, if this characteristic influences their involvement, it must be indicated here. When distributing questionnaires, some respondents report significantly deviant characteristics from expected norms that influence their responses, this must be noted. For example, this is the ideal space for cases like aesthetic evaluation of a game through color-based questionnaires where some respondents disclose being colorblind, an unanticipated factor;
17. *Participant profiles*: This unclassified item varies significantly between studies. The quantity and qualitative depth depend directly on the research. It enables analysis of whether participant groups adequately match the research's nature, e.g., many studies on computational solution usage or perception in Software Engineering involve Computing undergraduates, though the target population differs. This item should reveal such discrepancies.
    The format may vary considerably, e.g., long or short paragraphs, tables, simple sentences. When presenting qualitative aspects of involvement, many cases show attributes beyond research necessities, e.g., if reporting participants' ages, how does age relate to effective communication? When reporting gender, ethnicity/race, origin, institutional affiliation, among others. These data must be functionally useful for the report. Including attributes merely for inclusion wastes valuable space, distracts from key content, and unnecessarily exposes participant data.
    Even when initially tied to research practice rather than reporting, it's respectful to preemptively consider how participant data will be structured and recorded, ideally with their consent. For instance, a trans woman may prefer being identified as "trans woman" rather than "woman".
    Profiles should generally be anonymous, with identification permitted only when participants exercise informational self-determination [Bioni, 2019], i.e., freely, consciously, and rationally choosing identification. However, researchers must analyze potential exposure risks and whether the research genuinely requires such disclosure.

If the research occurs in multiple stages, each item in this form/list can be divided according to stages, considering that this stage division must be accounted for within the CEP framework. Alternatively, two separate estructures can be created.

This artifact's proposal aims to keep all human involvement information self-contained within it, i.e., concentrated in this specific section without dispersion throughout other parts of the publication.

This artifact covers only the textual communication of research practices involving human participants. The actual research practice may or should follow other parameters, procedures, or determinations. Concurrently, this artifact does not exhaust all potential ethical or moral considerations surrounding human involvement in computing research. A dedicated section for ethical or moral aspects remains recommended, without competing or creating redundancy with this textual framework.

Through the implementation of this textual framework, we aim for moral advancement in related topics, without claiming definitive, permanent, or absolute solutions. New challenges will inevitably emerge and will be addressed in future cycles, emphasizing participatory and collaborative engineering approaches.

5.2.2 Instances of using the framework

This section presents two instances of framework real usage. Both are applications of the framework in research involving doctoral dissertation, with objective and expressive human involvement.

The first instance concerns the communication of human involvement in the doctoral dissertation of the first author of this present work. The second instance was developed by the author of his own doctoral dissertation, specifically for this work, acting strictly as an expert. Since the artifact was developed to be used by the respective researchers responsible, it was decided to invite the author to fill in his own research data. This research was specifically selected due to our proximity to the author and the complexity of human involvement in his research.

First instance of use

The first instance is based on the doctoral dissertation of Carvalho [2024].

- *Initially expected involvement*: The first part emphasized breadth of research, maximizing the scenario and analyzed objects. The qualitative nature of the second part allows flexibility in participant numbers, provided the phenomena and behaviors communicated through their interaction showed sufficient complexity and relevance for reasonable scientific analysis yielding contributions. Thus, no specific quantity was expected.
  At the questionnaire's end, participants indicated interest in continuing to interviews. If interested individuals did not meet profile requirements, similar to questionnaire quality criteria, for pertinent phenomena or behaviors, the interview phase would be canceled, ending the study at questionnaires. Even with just one interview participant, depending on relevance, the emphasis could shift to depth of this interaction.

Therefore, the minimum expected for questionnaires ranged from one to any available or willing participants, considering that fewer responses would require meeting minimum quality thresholds. Larger quantities enabled quantitative approaches; smaller numbers favored qualitative emphasis.

For interviews, the minimum remained one participant, with a practical maximum around twenty, considering realistic scheduling logistics (approximately one hour per interview).

- *Involvement type*: Participation was active and direct, participants engaged actively with the research and interacted directly with data collection interfaces.
- *Total count*: 112 individuals participated. 20 questionnaire respondents completed both phases. Total: 112 questionnaire responses and 20 interviews conducted.
- *Specific counts*: 85 participants had their contributions used in final analyses after relevant profile selection from questionnaire respondents.

  Total interactions numbered 105. For those completing both phases, these represented two distinct interactions - though involving the same individuals, the interactive dynamics and constructs differed.
- *Experts or judges*: Experts participated only in the first part (systematic reviews), and this category of involvement as conducted was exempt from CEP requirements. However, in the second part these individuals returned as participants, counting as separate involvements.
- *Research Ethics Committee (CEP)*: Approved under CAAE 62922122.5.0000.5286.
- *Experience with CEP*: The CEP process proceeded as expected. Total approval time was 2-3 months, with two revision requests.
- *TCLE/TALE*: TCLEs were used, with specific versions for each phase.
- *TCLE specifications*: Standard forms were used. Confidentiality was guaranteed for interactions deemed "unethical" or immoral. However, self-reported heinous crimes would trigger my legal obligation to notify authorities.

  An idealistic accountability framework Vázquez [2018] involves shared responsibility, rejecting the detached "scientist-observer" role in such cases. To prevent occurrences, I recommended third-person discourse for all self-reporting, even regarding respondents themselves.
- *Nature of involvement*: Questionnaires used Google Forms (online). Interviews used Google Meet (online).
- *Involvement duration*: Questionnaire time varied (15-60 minutes) depending on discursive responses. Interviews lasted 1-2 hours.
- *Potential risks or harms*: No substantial risks existed beyond potential participant identification through responses. I implemented detailed anonymization protocols for all data combinations that might enable identification, a residual risk despite mitigation.
- *Extra-scientific regulations*: As noted, procedures balanced legal responsibilities regarding immoral or illegal disclosures with participant protection, given the research's complex ethical nature.
- *Additional ethical considerations*: Familiarity with some participants may have increased engagement, without threatening validity since analyzed phenomena were independent of researcher-participant relationships.

  The observer paradox Canning and Walker [2024] affected at least one interview. Post-recording, a participant expressed relief at being able to speak freely thereafter, indicating filtered responses during the formal session. While explicitly documented once, other cases may have occurred unnoticed, some participants likely self-censored despite anonymity assurances.
- *Special profile types*: None.
- *Participant profiles*: Detailed in respective dissertation sections.

Second instance of use

The second instance is based on the doctoral dissertation of Filho [2023]. A supporting text was provided to help understand the research by the author:

> "The methodological structure of the research is based on understanding and interacting with health professionals. This interaction aims to obtain an accurate view of the phenomenon, depressive disorder. The interaction through interviews and a questionnaire aimed to qualitatively identify the most relevant characteristics for identifying symptoms of depression in a real scenario, in a high-level description.
>
> A questionnaire was developed to collect information about the domain from health professionals and was applied through two experiments. The main objective of this questionnaire is to validate the group of characteristics of depressive disorder that are most used in related studies, selected through a systematic review of the literature. In addition, the questionnaire also serves as an instrument to understand the clinical context of the professional in their daily work. Based on the categories identified, we organize and describe the group of characteristics according to the type of information they represent.
>
> To improve understanding by the respondents, we called the characteristics metacharacteristics and adapted the way they were presented in the questionnaire, since the participants were not familiar with the common machine learning terminology. Therefore, the questionnaire does not present the characteristics and their technical names, in order to avoid misunderstandings among respondents.
>
> Each section of the questionnaire covers different types of information that will help build the perception about depression, the methods used by professionals to identify depression, the understanding of the population served by specialists, and valuable information for validating the characteristics. Therefore, it is possible to analyze and compare the opinions of different professionals through a semi-structured interview and a survey. This allowed

for a more consistent validation of the characteristics extracted from the literature, in addition to enabling the creation of artifacts, such as machine learning models better aligned with the psychology field." [provided by Filho [2023] author]

1. ***Involvement type***: Participation was active and direct, participants engaged actively with the research and interacted directly with data collection interfaces.
2. ***Total count***: Interactions with healthcare professionals yielded 52 valid responses. In the first phase using semi-structured interviews, 3 psychologists participated. Subsequently, an online questionnaire was distributed to various healthcare professionals beyond psychologists, resulting in 49 additional valid responses (totaling 52).
3. ***CEP***: Approved under CAAE 54865821.5.0000.5263
4. ***CEP experience***: The ethics review process proceeded as expected. Total approval duration was approximately two months (submitted via Plataforma Brasil on 17/12/2021, approved 04/02/2022), required one revision request.
5. ***TCLE/TALE***: TCLE was used.
6. ***TCLE specifications***: TCLE specifying: (1) participant confidentiality through identity coding, (2) exclusive scientific use of collected data, (3) no individual-level result disclosure, and (4) data storage/access restricted solely to the principal investigator without third-party sharing.
7. ***Nature of involvement***: Questionnaires were administered via Google Forms (estimated completion: 10-15 minutes). Interviews were conducted on Google Meet (average duration: one hour).
8. ***Potential risks or harms***: Minimal, given the online format and participants' ability to withdraw anytime. Contact with healthcare professionals aimed to understand clinical methodologies rather than identify individuals.
9. ***Additional ethical or moral considerations***: Familiarity with some participants may have facilitated engagement, without compromising validity since analyzed phenomena were independent of researcher-participant relationships.
10. ***Special profile types***: None.

6 Final Remarks

This work presented secondary research exposing the erratic and chaotic state of how human involvement is communicated in Brazilian computing research. From this scenario, based on negative phenomena and behaviors, we gathered foundational inputs about the state-of-the-art to develop a textual framework that mitigates or partially resolves the problems identified in phase one.

Our study revealed specific phenomena: (i) negligence toward the main topic, as authors perceive human involvement as insignificant and communicate it carelessly; (ii) confusing or inconsistent terminology, with inappropriate references when citations occur; (iii) excessive focus on results and findings while overlooking the epistemology of human participation; (iv) disregard for relationships with other research (Table 1). This deficient scenario stems primarily from ignorance and an undervaluing culture regarding this topic, not necessarily implying researchers devalue participants themselves, but certainly their formal communication about them.

In this work, we analyzed only the communication of the research limited to the text of the publication, which may differ from the practice of the research carried out. If something occurred during the course of the research practice and is not communicated in the publication, we considered it not to have occurred in the research in question. For example, the research project was approved by a research committee and this was omitted in the text of the publication.

Future work could study the relationship between the perceived value of what is communicated in a scientific publication and what is omitted, whether due to perceived importance or prioritization of space. For example, ignorance regarding the importance of communicating the involvement of CEP in research involving people or prioritizing "technical content" over ethical or moral aspects, due to space limitations.

The simplicity of this proposal, including its artifact, is a positive and promising aspect. Simplicity is a positive quality of an artifact, influencing its ease and intended use, such as understanding and modularization Wieringa [2014]. The expression of simplicity in a topic that has proven so complex due to its lack of representation actually reveals a potential effort to transform the ethical presentation of computing research in Brazil.

As is traditional for scientific research, this work presents limitations, threats and potential future work. As limitations, while we analyzed several SBC symposia, examining other venues might reveal new phenomena to enhance this proposal. The framework's simplicity, though seemingly a weakness, is intentional. Complex solutions would face even greater dismissal than the current undervalued topic. Epistemologically, next steps involve reviewing other communications to incorporate new requirements. The exclusion and inclusion criteria limited the works to be analyzed, impacting the discussions and results.

The threat related to reproducibility and replicability was further explored in Section 4.3, primarily related to ethical methodological decisions of this present work.

The internal threat of this proposal lies in its practical validation. The proposed artifact has not yet been exposed to experts or actual and expected users, its target audience. Its epistemological rigor is based on the subsequent practice of the methodology outlined in Section 4 and the synthesis of structured and formalized knowledge in the practice of related research, directly dedicated to the central phenomenon of this present work.

Qualities central to pragmatic research, such as usefulness and intended use [Wieringa, 2014], were perceived during the development of this artifact and in an oral presentation to the community at the XXIII Brazilian Symposium on Human Factors in Computing Systems (IHC) event. These brief interactions already highlighted the significance of this proposal, in parallel with the invitation for an extended version of the seminal work [Carvalho *et al.*, 2024a]. Both the knowledge synthesis and the proposed artifact represent a substantial contribution to research on ethical or moral aspects in

Brazilian computing, promoting moral advancement in the ethical culture of this community.

A pragmatic limitation of this research is its individual scope. Future studies could propose more comprehensive structural solutions. Initially, academic-scientific venues could actively enforce greater rigor regarding communication of human involvement in their own research, beyond just CEP compliance.

In addition to the suggestions for future work already mentioned in the text, other potential candidates are also considered. In the short term, an evaluation study should be conducted with (i) researchers experienced in human engagement, especially in special, vulnerable, and sensitive cases; (ii) potential users of the artifact, analyzing traditional factors such as usability and intended use; (iii) monitoring its use in real, practical cases. Additionally, the production of materials on CEPs, not limited to submission manuals, for example, a collection of experience reports on CEP participation, CEP involvement, among others. Promote the adoption and disseminate the artifact. In the medium term, monitoring the relationship between Computing and CEP engagement, updating the secondary research that underpins the proposed artifact; monitoring the use, evolution, and possible modifications to the textual framework; and proposing new artifacts based on objective or legalistic morality that help the community communicate other ethical or moral aspects, for example, frameworks involving data protection (LGPD) or AI. In the long term, incorporating a stable and well-established version into scientific methodology materials; definition as a standard in events for how to write people's involvement in publications.

Declarations

Authors' Contributions

Luiz Paulo Carvalho is the main contributor and writer of this manuscript, and conceived this study. Kamila Rios da Hora Rodrigues, Jonice Oliveira and Flávia Maria Santoro contributed to the partial writing of this work, organization and structuring of the content and in-depth review. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing or conflicts of interest regarding the publication of this work.

Acknowledgements

This is an invited extended version of the paper "A study and pragmatic proposal on the communication of human involvement in Brazilian computing research" [Carvalho *et al*., 2024a], published on the *XXIII Brazilian Symposium on Human Factors in Computing Systems*.

We declare the use of Artificial Intelligence as a support mechanism to enhance the quality of this work. We used ChatGPT, version GPT-5.0, and Google Translate; limited to translation, textual improvements or revisions. The results generated by these mechanisms were incorporated into this work only after review and necessary adjustments.

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