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Review

# Equity/Equality, Diversity and Inclusion, and Other EDI Phrases and EDI Policy Frameworks: A Scoping Review

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Abstract: Equity, equality, diversity, inclusion, belonging, dignity, justice, accessibility, accountability, and decolonization are individual concepts used to engage with problematic social situations of marginalized groups. Phrases that put together these concepts in different ways, such as "equity, diversity and inclusion", "equality, diversity, and inclusion", "diversity, equity and inclusion", "equity, diversity, inclusion, and accessibility", "justice, equity, diversity, and inclusion", and "equity, diversity, inclusion, and decolonization" are increasingly used, indicating that any one of these concepts is not enough to guide policy decisions. These phrases are also used to engage with problems in the workplace. Universities are one workplace where these phrases are used to improve the research, education, and general workplace climate of marginalized students, non-academic staff, and academic staff. EDI policy frameworks such as Athena SWAN and DIMENSIONS: equity, diversity, and inclusion have been also set up with the same purpose. What EDI data are generated within the academic literature focusing on EDI in the workplace, including the higher education workplace, influence the implementation and direction of EDI policies and practices within the workplace and outside. The aim of this scoping review of academic abstracts employing SCOPUS, the 70 databases of EBSCO-HOST and Web of Sciences, was to generate data that allow for a detailed understanding of the academic inquiry into EDI. The objective of this study was to map out the engagement with EDI in the academic literature by answering seven research questions using quantitative hit count manifest coding: (1) Which EDI policy frameworks and phrases are mentioned? (2) Which workplaces are mentioned? (3) Which academic associations, societies, and journals and which universities, colleges, departments, and academic disciplines are mentioned? (4) Which medical disciplines and health professionals are mentioned? (5) Which terms, phrases, and measures of the "social" are present? (6) Which technologies, science, and technology governance terms and ethics fields are present? (7) Which EDI-linked groups are mentioned and which "ism" terms? Using a qualitative thematic analysis, we aimed to answer the following research question: (8) What are the EDI-related themes present in relation to (a) the COVID-19/pandemic, (b) technologies, (c) work/life, (d) intersectionality, (e) empowerment of whom, (f) "best practices", (g) evaluation and assessment of EDI programs, (h) well-being, and (i) health equity. We found many gaps in the academic coverage, suggesting many opportunities for academic inquiries and a broadening of the EDI research community.

**Keywords:** equity; diversity; inclusion; equality; workplace; technologies; justice; decolonization; scoping review; marginalized groups; EDI; DEI



Citation: Wolbring, G.; Nguyen, A. Equity/Equality, Diversity and Inclusion, and Other EDI Phrases and EDI Policy Frameworks: A Scoping Review. *Trends High. Educ.* **2023**, *2*, 168–237. https://doi.org/10.3390/higheredu2010011

Academic Editor: Heather Kanuka

Received: 30 January 2023 Revised: 16 February 2023 Accepted: 27 February 2023 Published: 3 March 2023



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#### 1. Introduction

Many different EDI-related phrases such as "equity, diversity and inclusion", "equality, diversity and inclusion", "diversity, equity and inclusion", "belonging, dignity, and justice", "diversity, equity, inclusion and belonging", "diversity, dignity, and inclusion", "equity, diversity, inclusion, and accessibility", "justice, equity, diversity, and inclusion", "inclusion, diversity, equity and accountability", and "equity, diversity, inclusion, and decolonization" [1–22] and EDI policy frameworks such

as Athena SWAN [23] and others [24–37] exist. The Tri-agency Institutional Programs Secretariat (TIPS), which "manages the Canada Research Chairs Program (CRCP), the Research Support Fund, the Canada Excellence Research Chairs Program, the Canada First Research Excellence Fund, the Canada 150 Research Chairs Program and the New Frontiers in Research Fund", states on their webpage, Creating an Equitable, Diverse and Inclusive Research Environment: A Best Practices Guide for Recruitment, Hiring and Retention, the following:

"TIPS defines equity as the removal of systemic barriers and biases to enact the practice of fair and equitable treatment so that all individuals have equal access to and can benefit from the programs. To achieve this, institutions must proactively identify and address systemic barriers in their policies and work environments (e.g., racism, ableism, sexism, discrimination). They must embrace diversity, defined as differences in race, colour, place of origin, religion, immigrant and newcomer status, ethnic origin, ability, sex, sexual orientation, gender identity, gender expression, and age. Recognizing and valuing diversity and equity must be accompanied by concerted efforts to ensure the inclusion of diverse and underrepresented populations, meaning that individuals must be and feel valued, respected and equally supported" and "The institution must strive to put in place the right conditions for each individual, including those from underrepresented groups—women, racialized minorities, Indigenous Peoples, persons with disabilities and members of LGBTQ2+ (lesbian, gay, bisexual, transgender, queer, Two-Spirit, plus) communities—to reach their full potential, unimpeded by inequitable practices, including personal and systemic discrimination and racism, imposed by policies, processes and research environments. It is also important to recognize that many individuals have multiple social, economic, racial or sexual identities and often face increased discrimination or systematic barriers based on their intersecting identities" [31].

Additionally, on the Canadian equity, diversity, and inclusion Dimensions pilot program webpage, it is stated:

"is intended to publicly recognize post-secondary institutions seeking to increase equity, diversity, and inclusion (EDI) in their environments and across the research ecosystem. The program objective is to foster transformational change within the research community at Canadian post-secondary institutions by identifying and eliminating obstacles and inequities. This will support equitable access to funding opportunities, increase equitable and inclusive participation, and embed EDI-related considerations in research design and practices". [38]

Many EDI policy frameworks state that their decisions are evidence-based, and that data are important [24,25,27–30,37] and that systemic changes are needed [25,27–29,31]. As such, we suggest it is important to know what evidence and what data are generated in the academic literature that use the EDI phrases and policy frameworks and therefore can be used to inform EDI practices. It is, for example, noted that "Although diversity has been a guiding preoccupation in higher education for several decades, organizational diversity practice, i.e., what happens when colleges and universities implement diversity plans, is rarely a subject of inquiry. As a result, there is relatively little empirical understanding of why diversity has failed to significantly advance racial equity on college campuses" [39] (p. 1). In relation to not focusing on the term diversity by itself but on EDI phrases and policy frameworks, to our knowledge, no study has looked at what is covered within the academic studies mentioning EDI phrases and EDI policy frameworks (and thus not individual EDI concepts) and what data are generated. Therefore, we used a hit count frequency approach to answer seven research questions. We asked first the basic question: (1) Which EDI policy frameworks and phrases are mentioned? The workplace is one area EDI efforts cover. Therefore, we also asked the following: (2) Which workplaces are mentioned? Academia is one main area employing EDI phrases and EDI policy frameworks to enable change in the academic workplace. Therefore, we asked the following: (3) Which academic associations, societies, and journals and which universities, colleges, departments, and academic disciplines are mentioned? Medical disciplines and health professions are covered

extensively in conjunction with individual EDI concepts, and thus, health researchers are one group that engages with the "social" aspect of health, such as the social determinants of health and the ratio of engaging with the medical versus the social impacts EDI in the academic workplace, and according to medical/health profession associations, they are to be advocates for their clients and their profession and to be educators, researchers, and change agents [40–46], which would have to include their involvement in EDI policy discussions. Therefore, we asked the following question: (4) Which medical disciplines and health professionals are mentioned? Many social factors within and outside the workplace impact EDI workplace efforts. Marginalized groups are known to experience many social problems, many of which impact the EDI efforts within the workplace, including the university. Work/life balance is a phrase that has been used to look at the work-family nexus but is increasingly used to discuss life administration [47] in relation to other groups and beyond the family boundary. Disabled people, for example, experience three types of life admin, which has an impact on EDI efforts at the workplace: medical admin, benefits admin, and discrimination admin (disability admin) [48]. To gain a sense of what aspects of the "social" are linked to EDI workplace efforts, we asked the following: (5) Which terms, phrases, and measures of the "social" are present? University workplace areas engaging with science, technology engineering, and mathematics (STEM) have been discussed for some time using individual EDI concepts. At the same time, many science and technology concepts and ethics fields emerged to engage with the recognized reality that scientific and technological advancements have social, legal, ethical, and economic consequences [49–59]. As such, we asked the following; (6) Which technologies, science, and technology governance terms and ethics fields are present? There are a variety of marginalized groups who experience problems in their workplace and are covered under EDI, for example, women, Indigenous peoples, visible/racialized minorities, disabled people, and LGBTQ2S+ [1], and who experience problem with the social as evident, for example, in behaviors linked to various negative "isms" such as sexism, racism, disablism. Therefore, we asked the following: (7) Which EDI-linked groups are mentioned, and which "ism" terms are used? Finally using a qualitative thematic analysis approach, we answered the following research question: (8) What are the EDI-related themes present in relation to (a) the COVID-19/pandemic, (b) technologies, (c) work/life, (d) intersectionality, (e) empowerment of whom, (f) "best practices", (g) evaluation and assessment of EDI programs, (h) well-being, and (i) health equity. We discuss our findings through the lens of EDI framework policy documents and the concept of empowerment.

#### 1.1. EDI, the Workplace, and the Social

Equity, equality, diversity, inclusion, belonging, dignity, justice, accessibility, accountability, and decolonization are individual concepts used to engage with problematic social situations marginalized groups face, including at their workplace (academic and non-academic). Phrases that put together these concepts in different ways, such as "equity, diversity and inclusion", "equality, diversity and inclusion", and "diversity, equity and inclusion" [1–22] and EDI policy frameworks that use these phrases or parts of it [23–37] are used increasingly because it has been realized that using any individual concept leads to limitations in fixing the problem.

The academic journal *Equal Opportunities International* started in 1981 and was renamed in 2010 to *Equality, Diversity and Inclusion*. Under the aim of the journal, one reads:

"Equal opportunities and its allied concepts, including inequality, inequity, disadvantage, diversity, and inclusion, have been studied extensively across all disciplines of social sciences and humanities" ... "The advent of legal and social reforms in the field, as well as the broadening of the theory of equal opportunities to include a wider range of inequalities based on sex, race, disability status, age, sexual orientation, marital status, nationality and social class have all contributed to the general growth of scholarly interest in the field. EDI engages with this interest, offering a platform for critical and rigorous exploration of equal

opportunities concerns including gender, ethnicity, class, disability, age, sexual orientation, religion, as well as other nascent and incipient forms of inequalities in the context of society, organisations and work". [60]

Under the aim, the following is furthermore acknowledged:

"It is important to acknowledge that there are some dichotomies between the reality and rhetoric of equal opportunities, the forms of practitioner and the academic knowledge in the field, scholarly approaches to equal opportunities across disciplines of social sciences and humanities, as well as their use of concepts and methods in order to uncover inequalities, and offer strategies for change towards equality of opportunity, valuing of diversity or pursuit of social inclusion". [60]

As such, our study contributes to the knowledge of the state of the EDI-focused academic inquiry. Many problems are noted for groups covered under EDI [1,61–73] at their workplaces, and EDI is increasingly used to change the workplace situation of marginalized groups in general, including at universities, for the better [1]. According to Universities Canada, "EDI enriches the Universities and that the aim of members of Universities Canada is to develop an EDI action plan; to report the progress; to provide equity of access and opportunity by identifying barriers; to make visible and promote best practices of EDI; and to be guided by evidence" [74], as cited in [1]. Moreover, in the Canadian EDI framework, the following is stated:

"Dimensions: equity, diversity and inclusion Canada invites you to take part in a post-secondary transformation to increase equity, diversity and inclusion (EDI) and help drive deeper cultural change within the research ecosystem" [36] cited in [1] and "The Dimensions program addresses obstacles faced by, but not limited to, women, Indigenous Peoples, persons with disabilities, members of visible minorities/racialized groups, and members of LGBTQ2+ communities". [36], as cited in [1]

Many external issues impact how the workplace in general is experienced. Problems with work–life balance, such as in reconciling workplace set ups and personal lived reality and personal needs, is covered extensively in the literature. However, problems with the content of academic inquiry into work–life balance are noted [75], such as that work–life equals in most studies work–family life, and the focus is mostly on gender [76], and there is a biased focus on "middle and upper class, younger, White, western and heterosexual women" [77] (p. 533) and a lack of engagement with intersectionality [77]. Some studies exist for marginalized groups [75,76,78–84]; however, one study giving the following hit counts revealed the unevenness of engagement:

"ProQuest searches of 104 databases (filtered for only results classified as "scholarly articles" and "books") using the term "work-life" in combination with the following phrases or terms, separately: "nationality" (15 results), "ethnicity" (135 results), "religion" (118 results), "work life balance families family life" (5509 results; term suggested by ProQuest's algorithm), "race" (241 results), "age" (2441 results), "disability" (377 results), "illness" (345 results), "mental illness" (108 results), "sexual orientation" (59 results), "intersectionality" (30 results) and "gender identity" (219 results)". [77] (p. 535)

Some studies cover other aspects of the "life" component beyond the family angle, such as self-care [76,77], flexibility stigma [85], and leisure [86], which would also apply to the leisure parts of work (going out with fellow work members and travel [86]). The term life administration [47] was coined to flag the many issues people have to deal with, in particular, people not fitting a given norm. It is argued that disabled people experience three types of life admin: medical admin, benefits admin, and discrimination admin (disability admin) [48] as well as telework [87]. Burnout is linked to quality of life outside work [88]. External factors such as family support [89] also impact students' performance in courses [90] and what subject they choose [91]. The life balance inventory [92,93] and other quality-of-life indicators are answered differently if one does not fit the norm in a

variety of categories. Marginalized groups covered under EDI divert from given norms and as such face specific lived experiences impacting how they experience a workplace that does not take into account their lived experience.

#### 1.2. EDI and Governance of Sciences and Technologies

"Social" is often listed as part of the phrase "ethical, legal, social implications" of a given scientific or technological advancements and is one focus of governance of science and technology discussions [49–59]. EDI is also mentioned in recent technology strategies [94,95]. Given that the external "social" that people experience impacts workplace EDI realities and that technologies themselves influence the internal workplace EDI efforts, the question at hand considers which technologies and which science and technology governance terms and ethics fields are present in the abstracts covering the document.

A recent study looked at "computational Intelligence (CI) as an assistive technology for Equity, Diversity, and Inclusion (EDI)" [96] (p. 1) and argued that "the nature of EDI scenarios and their modeling requires CI approaches and techniques" [96] (p. 1). The authors argue that any one EDI concept is not enough and note that "risk measures are an integral part of the high-level measurement framework used in the EDI-aware systems" [96] (p. 2). They introduced three levels of questions for machine reasoning, namely what is, what if, and why? [96]. How these questions are answered depends on what data the machine reasoning has access to within the EDI context.

#### 1.3. EDI and Empowerment

Empowerment is often situated within the context of social change [97–103], as is disempowerment [104–106]. Empowerment is linked to individuals as social change makers [107] and groups, organizations, and communities [101] and covers the enhancement of social change through empowerment [108] and empowerment for social change [109–113]. What knowledge is accepted as evidence is important for being a social change agent [114], as knowledge empowers [115,116], and for empowerment, it is needed "to improve people's lives by providing a controlling understanding of social, economic, and political forces" [117] (p. 5047). Empowerment is linked to social justice [118] and the ability to make strategic life choices [119]. Empowerment is covered in relation to determinants of health [120-125], community-based rehabilitation [126,127], as an outcome measure of rehabilitation [128], the flourishing scale [129], the capability approach [130–132], and wellbeing [133–143]. Various lists of attributes, indicators, and measure of empowerment exist [119,144-149]: "Empowerment theory allows one to engage with legal, political, economic, social, and other forms of empowerment, and to understand and deal with inequality and to promote literacy of topics such as intersectionality, identity, agency, autonomy" [150] (p. 348). Empowerment theory is employed to look at the social, such as social empowerment [151–153], social justice [154,155], transformative or social action [156], civic engagement [157], social well-being [157], understanding social [158] and sociopolitical [128] environment, influencing socioenvironmental context [159], social power [160], and social class [161]. "Empowerment theory, research, and intervention link individual well-being with the larger social and political environment" [162] (p. 569) and put forth that that beliefs about the self can contribute to individual, community, and social change [163]. Empowerment is particularly needed for marginalized groups and is a way to address the problems the powerless face, including being powerless [157,163,164], such as in the context of disabled people [115,165-172]. Indeed, empowerment is mentioned in the UN Convention on the rights of persons with disabilities in relation to women with disabilities [173] and the UN Flagship report on Disability and Development [174]. One can argue that disabled people and other groups covered under EDI experience widespread disempowerment and lack of empowering experiences such as "opportunities to learn skills and develop a sense of control", which would "help individuals limit the debilitating effects of problems in living" [175] (p. 71). Universities are seen to empower people of all backgrounds to achieve their potential [176], including marginalized groups [177]. It is

argued that "radical empowerment theory, which relates discriminatory social relations to societal discourses" should be employed in education [178] (p. 401). As such, EDI fits as an area of interventions for empowerment and empowerment theory. EDI documents of many universities, companies, and non-governmental associations use the term empowerment (for example, [179–182]). One could describe the EDI policy frameworks as frameworks for empowering the marginalized in the educational/research/funding settings and beyond. However, it has to cover every EDI group, as different EDI groups look at, experience, and desire empowerment in different ways [150,183].

#### 2. Materials and Methods

#### 2.1. Study Design and Research Questions

Scoping studies are used to identify and better understand the state of research on a given topic [184,185]. In this scoping review study, we focused on EDI and aimed to answer the following questions using a frequency hit count approach (1) Which EDI policy frameworks and phrases are mentioned? (2) Which workplaces are mentioned? (3) Which academic associations, societies, and journals and which universities, colleges, departments, and academic disciplines are mentioned? (4) Which medical disciplines and health professionals are mentioned? (5) Which terms, phrases, and measures of the "social" are present? (6) Which technologies, science, and technology governance terms and ethics fields are present? (7) Which EDI-linked groups are mentioned as well as which "ism" terms? Using a thematic analysis approach, we sought to answer the following research question: (8) What are the EDI-related themes present in relation to (a) the COVID-19/pandemic, (b) technologies, (c) work/life, (d) intersectionality, (e) empowerment of whom, (f) "best practices", (g) evaluation and assessment of EDI programs, (h) well-being, and (i) health equity.

#### 2.2. Data Sources, Data Collection, and Inclusion and Exclusion Criteria

On 18 April 2022, abstracts in the academic databases *EBSCO-HOST* (an umbrella database that includes over 70 other databases itself), *Scopus* (which incorporates the full *Medline* database collection), and *Web of Sciences* were searched with no time restrictions (Table 1, strategy 1 and 2). Within *Scopus*, we also searched specifically for all abstracts of journals containing "equality, diversity and inclusion" in the title (search strategy 3). As to inclusion criteria, scholarly peer-reviewed journals were included in the *EBSCO-HOST* search and reviews, peer-reviewed articles, conference papers, and editorials in *Scopus*, and the *Web of Science* search was set to all document types. As for exclusion criteria, all data found through the search strategies not covering the content mentioned under inclusion criteria were excluded from the content analysis. We repeated the search from April 2022 on 8 November 2022 for strategies 1–2, using only 2022 as the timeframe of publication (Table 1, search strategy 4).

Table 1. Search Strategy.

Strategy	Sources Used	Terms Used	Downloaded
Strategy 1	Scopus, EBSCO-HOST, Web of Science	ABS ("Athena SWAN" OR "See change with STEMM Equity Achievement" OR "Dimensions: equity, diversity and inclusion" OR "Science in Australia Gender Equity" OR "NSF ADVANCE" OR "equity, diversity and inclusion" OR "equality, diversity and inclusion" OR "diversity, equity and inclusion" OR "diversity, equality and inclusion")	2349 duplicate = 1114

Table 1. Cont.

Strategy	Sources Used	Terms Used	Downloaded
Strategy 2	Scopus, EBSCO-HOST, Web of Science	ABS ("belonging, dignity, and justice" OR "diversity, equity, inclusion and belonging" OR "diversity, dignity, and inclusion" OR "equity, diversity, inclusion, and accessibility" OR "justice, equity, diversity, and inclusion" OR "inclusion, diversity, equity and accessibility" OR "inclusion, diversity, equity and accountability" OR "equity, diversity, inclusion, and decolonization")	73 duplicate = 36
Strategy 3	Scopus	Equality, Diversity, and Inclusion (2010–2022) (title of journal). The title of its predecessor, Equal Opportunities International (1981–2010), was not available in Scopus and the journal Equality Diversity and Inclusion An International Journal (2010–2013) and Equality, Diversity, and Inclusion at Work: A Research Companion (2009)	781, no duplicate
Strategy 4	Scopus, EBSCO-HOST, Web of Science	Strategies 1 and 2 together (search done 8 November 2022)	Limiting the search to 2022 and after elimination of the duplicates of abstracts already found for 2022 in the April 2022 search using strategies 1 and 2, strategy 4 generated 531 new abstracts

#### 2.3. Data Analysis

To access the abstracts for our analysis, we downloaded the abstracts generated through strategies 1–4. The abstracts were downloaded as part of the citations from the search engines into the Endnote<sup>TM</sup> 20 Software (Clarivate, London, UK), and the Endnote<sup>TM</sup> 20 software was used to delete all duplicate and non-English abstracts. The cleaned-up set of citations with the abstracts for each of the four strategies was exported from the Endnote TM 20 software as Word RTF files using two export strategies. In the first export strategy, we exported the citations with metadata covering various information besides the actual abstracts, such as reference type, author names, dates, years, volume, issue, page numbers, title of article, journal name from which the abstract originated, author addresses, and other categories of metadata.

In the second export strategy (modifying the export function), we only downloaded the abstracts together with metadata covering the reference type, author names and year, issue, page numbers, and DOI. We cut as much metadata as possible to decrease false-positive hits for search terms where the hit did not originate from the abstract but from other metadata such as author addresses, titles of article, and titles of the journals.

For each strategy, one RTF file was generated containing all the references as described. Given that strategy 1 generated 1114 abstracts and strategy 2 only 36 abstracts, we merged the two RTF files of these strategies, therefore resulting in three final RTF files; we then transformed these into three PDF files. These three PDF files were uploaded into NVIVO  $12^{\text{TM}}$  (QSR International, Burlington, MA, USA) qualitative coding software for qualitative analysis to answer research question 8. The three PDF were also added to the desktop to be analyzed using Adobe Acrobat<sup>TM</sup> XI software (Adobe, San Jose, CA, USA) for our descriptive quantitative manifest coding analysis approach [186–189] generating hit counts for the search terms to answer research questions 1–7.

The search terms were generated based on our knowledge of the existing literature or having read the abstracts obtained through strategies 1 and 2.

For search terms that generated less than 100 hits, we went through every hit and as such did not record the hits but the actual number of abstracts containing the given search term, eliminating with that all false positives.

For search terms that generated 100 or more hits, the hit counts are a maximum, as a given search term can show up more than once in a given abstract, and sometimes, there is non-relevant information that is part of the abstracts, such as copyright notices.

The manifest coding descriptive quantitative analysis approach was performed by both authors, and peer debriefing between the two authors was employed, comparing the hit counts and number of abstracts obtained.

For research question 8, we performed a thematic analysis of how EDI was covered in relation to (a) the COVID-19/pandemic, (b) technologies, (c) work/life, (d) intersectionality, (e) empowerment of whom, (f) "best practices", (g) evaluation and assessment of EDI programs, (h) well-being, and (i) health equity. As for the thematic analysis, both authors used the qualitative analysis NVIVO  $12^{\text{TM}}$  software to generate the themes [186,190] linked to research question 8 independently and identified and clustered themes based on meaning and repetition, and then, the two authors peer debriefed by comparing the themes, and the few differences were resolved through discussion. Confirmability is evident in the audit trail made possible by using the Memo and coding functions within NVIVO  $12^{\text{TM}}$  software.

#### 3. Results

The result section is separated into three sections. In Section 3.1, we provide a timeline of how many abstracts were published in which year for strategies 1–3. Strategy 4 was only covering 2022. Section 3.2 provides a summary of our quantitative hit count data from Tables A1–A15, which all are in the Appendix A; and Section 3.3 is a summary of our qualitative thematic data.

Within Section 3.2, we summarize in Section 3.2.1 the frequency results related to EDI actors, phrases, frameworks, and groups (research questions 1–4 and 7 and Tables A1–A6). In Section 3.2.2, we summarize our frequency results of the use of terms and phrases linked to the "social" (Tables A7–A14, research question 5), and in Section 3.2.3, we summarize the frequency results around technologies and science and governance and ethics terms (Table A15, research question 6).

In Section 3.3, we cover the results for research question 8 and report on themes related to COVID-19 (Section 3.3.1), technologies (Section 3.3.2), work/life (Section 3.3.3), intersectionality (Section 3.3.4), empowerment of whom (Section 3.3.5), "best practices" (Section 3.3.6), evaluation and assessment of EDI programs (Section 3.3.7), well-being (Section 3.3.8), and health equity (Section 3.3.9).

In short, our hit count and thematic analysis results show gaps in EDI coverage in relation to all the topics investigated.

#### 3.1. Timeline of Publications

As for the 1114 abstracts from strategy 1, 198 abstracts were from January–18 April 2022, 512 from 2021, 164 from 2020, 87 from 2019, 28 from 2018, 13 from 2017, 21 from 2016, 15 from 2015, 18 from 2014, 10 from 2013, 5 from 2012, 5 from 2011, 15 from 2010, 3 from 2009, 2 from 2008, 1 from 2007, 1 from 2006, 2 from 2005, 1 from 2004, 1 from 2003, and 13 had no year.

As for the 36 abstracts from strategy 2, 12 abstracts were from January–18 April 2022, 21 from 2021, 2 from 2020, and 1 had no year. Of the 36 abstracts, 25 abstracts were also found in the 1114 abstracts because the search term "justice, equity, diversity, and inclusion" for strategy 2 that generated 25 abstracts contains "equity, diversity, and inclusion", which was one search term for strategy 1.

As for the 781 abstracts from strategy 3, 136 were from 2022, 58 from 2021, 69 from 2020, 60 from 2019, 53 from 2018, 45 from 2017, 29 from 2016, 48 from 2015, 49 from 2014, 51 from 2013, 45 from 2012, 53 from 2011, 52 from 2010, and 33 from 2009.

As for strategy 4, which covered 18 April–8 November 2022, we found 531 abstracts.

#### 3.2. Quantitative Hit Count Results (Short Summary)

The search terms we used were generated based on our knowledge of the existing literature (Tables A1, A2 and A8, Tables A9–A15) or by having read the abstracts obtained through strategies 1 and 2 (Tables A3–A7)

#### 3.2.1. EDI Actors, Terms, Phrases, Frameworks, and Groups

As for EDI actors, phrases, frameworks, and groups (Tables A1–A6, research questions 1–4 and 7), Table A1 shows that there was a very uneven coverage of the EDI phrases and EDI policy frameworks in the abstracts obtained through strategies 1 and 2. As for EDI policy frameworks, only "Athena SWAN" and "NSF ADVANCE" generated some hits, with "See change with STEMM Equity Achievement", "Dimensions: equity, diversity and inclusion", and "Science in Australia Gender Equity" generating no hits. Of the twelve EDI phrases, only three generated over 100 hits (not abstracts; two between 10–50 abstract hits, three less than 10 abstract hits, and four no hits). In general, the numbers for the abstracts generated through strategy 3 were much lower, with many more giving 0 hits. "Equality, diversity and inclusion" generated the most hits with 37 abstract hits. As for individual EDI terms making up the different phrases, only diversity, equality, equity, inclusion, and justice had many hits. As for strategy 4, the 531 abstracts did show a similar hit profile than recorded for the abstracts from strategies 1 and 2.

Table A2 reveals very uneven to no engagement with EDI groups and an uneven presence of isms and phobias related to EDI. Only the terms "gender", "ethnic", "race", "black", "of color", and women generated over 100 hits in the abstracts obtained with strategies 1 and 2. All terms linked to disabled people generated low to no hits. As for isms, only racism generated more than 100 hits. In general, the hits generated through strategy 3 were much lower, with many more giving 0 hits. As for strategy 4, the 531 abstracts did show a similar hit profile than recorded for the abstracts from strategies 1 and 2.

For Table A3, we read all the content linked to the term "workplace" in the abstracts of strategy 1 and 2. Table A3 shows for strategies 1, 2, and 4 that the term "workplace" was mostly used without specification. For general workplace categories, "higher education", "college", and "university\*" were by far the most present. Very few specific workplace areas were found. For strategy 3, we did not analyze which workplaces were present, as the abstracts containing EDI phrases and frameworks from strategy 3 are already covered under strategies 1 and 2. However, the ones found in the abstracts found with strategy 1 and 2 generated no hits for strategy 3, indicating that the hits were in the abstracts containing EDI terms that were also covered by strategy 1 and 2 and not in the abstracts obtained with strategy 3 that did not contain EDI terms.

For Tables A4–A6, we obtained the terms by reading all the abstracts obtained through strategies 1 and 2, and the frequencies for these terms were identified for the abstracts linked to strategies 1–4. Thus, the abstracts for strategies 3 and 4 were not read to identify new terms. Given this, Table A4 shows various associations, societies, and journal names, but most were only mentioned once. Table A5 shows that there were some hits for the terms "university", "higher education", and "college" (same terms as in Table A3). However, as for specific disciplines or names of departments, only "engineering" and "STEM" and the generic terms "research" and "science" generated over 100 hits in the abstracts of strategy 1 and 2, with fewer hits in the abstracts obtained through strategy 3. Strategy 4 follows the trend of strategies 1 and 2. For all strategies' hits, the terms "faculty" and "student\*" received more hits than "staff".

Table A6 shows hits with various medical specialties but few with health professions, and most hits were below 100, with strategy 3 generating fewer hits than strategy 1 and 2. As for strategy 4, the 531 abstracts did show a similar hit profile than recorded for the abstracts from strategies 1 and 2.

#### 3.2.2. EDI and the "Social"

As for the issue of the "social", we report the frequencies of the use of terms and phrases linked to the "social" in Tables A7–A14, covering research question 5.

For Table A7, we obtained the "social" terms by reading all the abstracts obtained through strategies 1 and 2, and the frequencies for these identified terms were obtained for the abstracts linked to strategies 1–4. Therefore, the abstracts for strategies 3 and 4 were not read to identify new "social" terms. Table A7, in which we recorded every

phrase containing the term "social" in the abstracts generated through strategies 1 and 2 (51 phrases) and then performed a frequency analysis of these terms for the abstracts obtained with strategy 1–4, indicates that very few of these terms had many hits. Only the term "social" generated more than 100 hits. For abstracts obtained with strategy 3, the number for "social" was higher than for strategies 1, 2, and 4, but all other terms had lower numbers.

In Table A8, we report on social indicators from the existing literature [191–227]. As for the abstracts from strategies 1 and 2, the term "social" had the most hits. The terms "bias", "identit\*", "justice", and "COVID" generated more than 100 hits. The term "ethic\*" was found in 40 abstracts, "solidarity" in 8 abstracts, and "stigma" in 14, to name a few. Table A8 also shows that well-being as an indicator of the social was only found in 35 abstracts, and in terms of specific types of well-being, only "psychological well-being" generated any hits, namely two. The hits were lower in number for the abstracts obtained through strategy 3, and the strategy 4 abstracts follow the trend of strategies 1 and 2 abstracts.

As for UN international documents covering social groups ("Convention on the rights of the child", "Convention on the rights of persons with disabilities", "Declaration on the Rights of Indigenous Peoples", "International Convention on the Elimination of All Forms of Racial Discrimination", and "Convention on the Elimination of All Forms of Discrimination against Women"), only the "Convention on the rights of Persons with Disabilities" was mentioned once in strategies 1 and 2 abstracts and once in strategy 3 abstracts. None were mentioned in the abstracts obtained with strategy 4.

There are many composite measures that use sets of indicators of the "social". As for strategies 1 and 2, Table A9 shows that of the 21 terms covering composite measures of the "social", 18 generated no hits. Only the phrase "determinants of health" and "social determinants of health" both generated both twelve hits, and the phrase "capability approach" generated one hit. The hits were even lower in number for the abstracts of strategies 3 and 4.

In Tables A10–A13, we report on the individual indicators of the "Community Based Rehabilitation matrix", the "Canadian index of well-being", the "OECD Better life index", and the "Social determinants of health". All tables show a very uneven coverage of the individual indicators (108), with generic ones such as "health", "education", "communication\*", and "social" generating more than 100 hits (23 terms, some duplicates between the tables, had over 100 hits in strategy 1 and 2, which include the terms "gender", "ethnic\*", and "race"). Of the 108 indicators, 38 generated 0 hits in the abstracts covering strategies 1 and 2, including the search terms "assistive technology" OR "assistive technologies" OR "assistive device" OR "assistive devices", with 27 having less than 10 hits, including phrases such as "social support", "social norms", "life satisfaction", and "social exclusion". Twenty generated 10–100 hits, with terms such as "stress" generating 12 hits. The numbers were lower for strategies 3 and 4.

As for strategies 1 and 2, Table A14 shows very few hits with social terms identified from the CRPD [228]. Of the 79 social-issues-related terms, only 4 had more than 100 hits (awareness, knowledge, mentor, and training). Thirty-six generated no hits. The hits were fewer for abstracts obtained through strategies 3 and 4.

## 3.2.3. EDI and Technologies, Science and Technology Governance Concepts, and Ethics Fields

The technology terms with hits were found by reading the abstracts obtained through strategies 1 and 2 (we added the assistive technology, which was part of another previous table), and the ethics and science and technology terms were used based on our knowledge of the science and technology and ethics literature.

As for strategies 1 and 2, Table A15 shows little mentioning of technologies, with engineering as the main one mentioned, including the generic term "technolog\*". Of the 11 science and technology governance terms, only "technology governance" and "science and technology governance" were mentioned once. As for the six ethics fields, none

generated any hits. AI-ethics and bioethics generated one and two hits in abstracts of strategy 4.

#### 3.3. Qualitative Thematic Data

In the qualitative data section, we report on the 1150 abstracts obtained through strategies 1 and 2 and the 531 abstracts obtained through strategy 4. We do not report on content of abstracts of strategy 3, as the EDI phrases and frameworks in these abstracts are already covered under strategies 1 and 2, and the other abstracts do not cover EDI policy frameworks and phrases.

### 3.3.1. EDI and COVID-19/Pandemic

Positive Impact of COVID/Pandemic on EDI

As for the 1150 abstracts obtained through strategies 1 and 2, 16 abstracts suggested that the COVID-19 pandemic led to an engagement with EDI/DEI, such as in gerontology [229-231], physical education [232], the neurology field [233], learning environment of health professionals [234], academic digital library of a graduate business school [235], meetings [236], family medicine [237], digital learning [238], special education professionals [239], academic leadership using the phrase "justice, equity, diversity, and inclusion" [230], telesupervision [240], healthcare staff [241], faculty competence framework [242], and the board of the American Association of Family and Consumer Sciences (AAFCS) [243]. Seven abstracts explicitly stated that DEI [244-247], EqualityDI [248], or EDI [249,250] are needed, for example, that approaches purely based on science and technology in relation to COVID-19 are not enough and that DEI is needed [244]. Some stated that EDI was explicitly used to make changes such as in the delivery of education [251,252]. One abstract highlighted the involvement of a diversity, equity, and inclusion (DEI) Committee in an organization to identify ways to augment its already comprehensive vaccine education campaign in order to build confidence among employees from minority communities [253]. One abstract reported for an annual meeting by AmeriFlux that the meeting emphasized diversity, equity, and inclusion (DEI), which resulted in an unexpected enhancement of science communication and community connections [254]. In one abstract, it was argued that virtual internships that became a necessity during COVID-19 can avoid the limitations of in-person internships as well as possible solutions to perceived pitfalls of virtual internships and that the development and continuation of virtual internships in the future can be a valuable tool to add to the suite of existing internship opportunities, possibly further promoting diversity, equity, and inclusion in ecology and STEM [255]. Thinking about the effects of COVID-19, it was stated in one abstract that science lacks diversity and that the International Women in Supramolecular Chemistry network believes that taking an area-specific approach effectively supports equality, diversity, and inclusion [248]. One abstract focusing on the equity, diversity, and inclusion aspect of tenure of women and decline in numbers of women through the professorial ranks made the point that the COVID-19 reality showed that different approaches are needed [256]. In one abstract, it was stated that COVID-19 and the Black Lives Matter (BLM) movement vastly reshaped the thinking of the author regarding equity, diversity, and inclusion (EDI) [257].

As for the 531 abstracts obtained through strategy 4, we found eight relevant abstracts. One abstract focused on the case study of U.S. Steels and that their DEI efforts were a positive for the company, especially given the problems COVID-19 caused. Further, U.S. Steel is put forward as a positive example of the benefits of implementing DEI [258]. Six abstracts argued that the focus on EDI increased in response to COVID-19 [259–263]. One looked at big data analysis and artificial intelligence in dealing with COVID-19 while also keeping in mind DEI and saw what was done as positive [264]. One abstract mentioned a report that looked at COVID-19 impacts on Art and Design School Libraries (ADSL) in North America and on DEI. From the abstract, it is not clear whether that includes COVID-19's impact on DEI [265].

#### Negative Impacts That COVID Pandemic Had on EDI

As for the 1150 abstracts obtained through strategies 1 and 2, negative effects of the COVID-19 pandemic were mentioned in 16 abstracts as a reason why it is essential to advance EDI [15,232,266–272]. At the same time, two stated explicitly that COVID-19 and its consequences led to or could lead to a decrease in engagement with EDI [273] and DEI [274]. Four abstracts stated that the COVID-19 pandemic highlighted existing diversity, equity, and inclusion challenges such in the STEM field [275], the U.S. healthcare delivery system [276], the role of nurses [277], and gender pay equity, diversity, and inclusion [278]. One stated that "the COVID-19 pandemic has posed major challenges for diversity, equity, and inclusion (DEI) efforts in research and academia" [279] (p. 3358). One made the case that the Athena SWAN framework can be used to reveal EDI problems in emergencies such as COVID-19 [275].

As for the 531 abstracts obtained through strategy 4, we found two relevant abstracts. One abstract argued that COVID-19 increased the "time and effort tax" on Black faculty to engage in DEI efforts in academia and biomedicine [263] (p. 1), and one argued that COVID-19 complicated their DEI and well-being challenges [280].

#### 3.3.2. Technologies and EDI

As for the 1150 abstracts obtained through strategies 1 and 2, technologies were reported as having a positive impact on EDI. Nineteen abstracts argued that there is a need to improve on EDI, using different EDI phrases such as diversity, equity, inclusion, and justice (DEIJ) [281]; DEI [275,282-294]; EDI [49,295-297]; and gender equity, diversity, and inclusion [62]. Technologies were seen to impact identities [298]. EDI was linked to technology access, and it was stated that technologies can be used for better communications; for example, media tools could be used to generate communities of practice on equity, diversity, and inclusion in higher education [281,299]. It was argued that "the development and continuation of virtual internships in future can be a valuable tool to add to the suite of existing internship opportunities, possibly further promoting diversity, equity, and inclusion in ecology and STEM" [255] (p. e3961) and that "Science, technology, engineering, and mathematics (STEM) professional societies (ProSs) are uniquely positioned to foster national-level diversity, equity, and inclusion (DEI) reform" [300] (p. 1) and that "AUDIO+ engages students, researchers, and industry professionals in a critical dialogue on music production cultures, innovative technologies, and the pressing need for increased equity, diversity and inclusion in our field" [301]. In one abstract, it was argued that although technologies are often described as unbiased, "the views, perspectives, and experiences of designers are embedded in technology", and the biases of the designers "whether conscious or unconscious, have resulted in technologies that have been particularly harmful for marginalized populations" [302] (p. 1). In the same abstract, it was argued further that applying DEI in engineering education could decrease the biases [302]. Another abstract introduced iEMBER, a forum for advancing DEI in STEM [303]. Finally, one abstract argued that the "current COVID pandemic shows that approaches based on science and technology alone are inadequate to improving community lives" [236] (p. 1167) and that DEI is another lens needed for decision making [244].

As for the 531 abstracts obtained through strategy 4, we found 17 relevant abstracts. All the mentions of the term technology in conjunction with EDI were positive. One abstract outlined a study that focused on the use of "Computational Intelligence (CI) as an assistive technology for Equity, Diversity, and Inclusion (EDI)" [96] (p. 1), another was about embedding EDI into simulation technologies [304], and a third was about a hope speech dataset to enable EDI [305]. Indeed, various abstracts came from the 2nd Workshop on Language Technology for Equality, Diversity, and Inclusion (LTEDI) [306–316]. Furthermore, one abstract was about "piloting a new Living and Learning Community (LLC) focused on Justice, Equity, Diversity and Inclusion (JEDI) Technology Ethics" [317] (p. 1). One abstract covering AI technologies and ethics stated that "when considering our modern world and striving for diversity, equity, and inclusion, it is essential to ensure that technology works

for all" [318] (p. 1), and one abstract was about the Accreditation Board for Engineering and Technology demanding that DEI is covered in curricula [319].

#### 3.3.3. Work-Life or Work/Life

As for the 1150 abstracts obtained through strategies 1 and 2, of the five abstracts mentioning work-life balance in relation to EDI phrases and frameworks, one listed EDI as part of the seven areas of human resource development [320] and another as being one indicator in the C-Change survey used [321]. One stated that they will use a "diversity, equity and inclusion (DEI) model to guide the response to future challenges within a faculty competency framework" [242] (p. 1) to deal with stress increased by the COVID reality, whereby one stress factor flagged was work-life well-being [242]. Two abstracts addressed EDI and work-life balance more substantially. One stated that there is the perception that Athena SWAN "has limited ability to address" the "persisting lack of work-life balance in academic medicine", and the authors stated "this study suggests that Athena SWAN has a positive impact in advancing gender equality, but there may be limits to how much it can improve gender equality without wider institutional and societal changes" [322] (p. 1). Moreover, one engaged in depth with work/life policies prevalent at NSF ADVANCE institutions, concluding that for most policies, ADVANCE institutions are seen as progressive [323]. As for the three abstracts that showed some linkage between EDI policy frameworks and phrases and the phrase "work-life", reading the full articles showed that work/life was used with the meaning of work/family [242,322,323].

As for the 531 abstracts obtained through strategy 4, we only found one abstract simply stating that the pandemic forced workers and employers to rethink "work-life integration" [324] (p. 1).

#### 3.3.4. EDI Groups and Intersectionality

As for the 1150 abstracts obtained through strategies 1 and 2, only 7 abstracts covered the theme of intersectionality in relation to EDI groups, saying that "intersectionality through what I call racism-centered intersectional approaches" [325] (p. 1099), "intersectionality among Latinx students", "intersectional diversity and a racialized Latinx identity at Hispanic-serving community colleges (HSCCs)" [326] (p. 1), and "intersectionality defines unique issues at the intersection of race and gender" [327] (p. 1). One discussed "intersectionality—how gender, race, social class and other identities intersect to produce disparate experiences and outcomes for individuals differently positioned in social systems" [328] (p. 140) and another "intersectional approach that considers race, geographical location, caring responsibilities, disability, neurodiversity, religion, and LGBTQIA+ identities" [329] (p. 2). One covered black feminists [330], and one stated that there is an intersectionality between disabled people and other EDI groups [1].

As for the 531 abstracts obtained through strategy 4, we found 4 relevant abstracts. In one abstract, it was stated that the "paper analyses the extent to which intersectionality is considered in university strategic approaches to equity, diversity, and inclusion, and how intersectionality is expressed within diversity and inclusion strategic plans at Australian universities", concluding that the engagement was mostly "limited to aspirational statements and acknowledgements rather than meaningful enactment" [331] (p. 1). The second one covered the intersectionality between being Deaf and ethnic identity [332]; the third one mentioned women of color, women with family responsibilities, and women with caregiving responsibilities [333]; and the fourth discussed "females, immigrants and people of color" [334] (p. 1).

#### 3.3.5. Empower\* of Whom

As for the 1150 abstracts obtained through strategies 1 and 2 of the 17 relevant abstracts we found using "empower\*", 1 abstract sought to empower "underrepresented minority leadership" in order to bring diverse perspectives and lived experiences to science in academia" [335] (p. 1019). One study evaluating their NSF-funded 4-year Research-Practice

Partnership (RPP) of district and school administrators, teachers, university researchers, and external evaluators stated that "the RPP broadened its focus on understanding race and equity to empower students to understand how technology affects their identities and to equip them to critically participate in the creation and use of technology" [298] (p. 592). As for the empowerment of whom, students were a focus in [336,337], marginalized engineering students in [338], undergraduate ecology research students in [339], learners in [340], medical residency students in [341], nurses in [342], individuals holding DEI positions within intercollegiate athletics in [343], the "Common Good Players an applied performing arts troupe comprising of diverse undergraduate and graduate students of various majors dedicated to social justice" in [14] (p. 207), "a diverse set of students and influencing their decision to pursue a career in the museum field" in [344] (p. 391), DEI champions in [345], and "ESA members to work toward creating a more inclusive society and scientific discipline" in [346] (p. e01595). One argued that aspects of "selfempowerment from our intersectional and multiple positionalities across the student-staff continuum within the neoliberal university have been trust, courage and silence" [347] (p. 475). Geoscientists were seen as change agents [348], and it was argued that staff has "to make concrete steps towards increased health equity" [241] (p. E94).

As for the 531 abstracts obtained through strategy 4, we found 5 relevant abstracts that mentioned the following as targets for being empowered: underrepresented minority leadership [335], individuals change agents [349], people discussing EDI in libraries [350], DEI in radiology [351], and students [319].

#### 3.3.6. Best Practices

Within the 1150 abstracts obtained through strategies 1 and 2, we found three relevant abstracts containing "best practice\*". In one abstract, it was argued that "The American Association for Anatomy (AAA), with its expressed and practiced culture of engagement, can serve as a model of best practice for other professional associations working to become more inclusive of individuals from historically underrepresented groups" [335] (p. 1019). The second abstract introduced the "directory/library of organisational best practice" [352] (p. 980). The third argued that clinical learning environments do not incorporate DEI, and they suggested best practices for fixing the problem [353]. Although not using the phrase "best practice", one abstract stated the following:

"Concrete solutions are necessary and provided within this article for incorporating inclusive practices into your fitness facility to engage current and potential members with a disability. Inclusion can be achieved through five key steps: (1) defining an inclusion policy, (2) educating staff, (3) removing all barriers, (4) including community members with disabilities, and (5) implementing consistent evaluation of practices. Following these five steps will help your organization achieve inclusion and put your equity, diversity, and inclusion philosophies into practice. Apply It!: • How to create a concrete plan for disability inclusion at your fitness facility. • Learn specific examples of inclusive practices. • Understand common barriers and solutions to become accessible to all participants". [354] (p. 16)

As for the 531 abstracts obtained through strategy 4, we found 6 relevant abstracts. One study was about seven best DEI practice strategies in nursing education [355]. One asked the following question: "How can participation in an FLC [faculty learning community] nudge engineering faculty to adopt and personalize mindful reflection and DEI best practices?" [356] (p. 1). One argued that there needs to be more training that links equity, diversity, and inclusion concepts with best practices [357]; one argued that "designing strategies to implement diversity, equity, and inclusion (DEI) best practices have become a mainstream topic of conversation in the workplace" [324] (p. 1); one covered a psychology curriculum questioned the lack of availability of best practices for DEI instruction outside of diversity/multicultural courses [358]; and one focused on best practices around the setup

of a "Diversity, Equity, and Inclusion (DEI) committee for the well being" in a correction agency [359] (p. 9).

#### 3.3.7. Evaluation and Assessment

As for the 1150 abstracts obtained through strategies 1 and 2, we found 21 relevant abstracts that used the term "evaluation" in relation to EDI. Studies proposed the evaluations of EDI [360], including science curricula [361]; EDI-specific curricula [362]; incorporating equality, diversity, and inclusion principles into graduate teaching assistants training [363]; strategic EDI plans [364]; evaluation of the Society of Behavioral Medicine (SBM) Leadership Institute integration of diversity, equity, and inclusion into their emerging leadership roles [365]; and UCSF CFAR Mentoring the Mentors program [366]. Evaluation of EDI activities were seen as needed [345], such as in pharmacy education [367]. Studies were seen as being useful for the evaluation of EDI issues [368]. It was noted during the "formative evaluation to assess Mayo Clinic Department of Health Sciences Research (HSR) faculty and staff perceptions toward a proposed departmental DEI plan" that "specific plan activities were perceived differently by members of certain diversity or professional subgroups" [369] (p. E88). One study proposed a culturally responsive evaluation framework to improve diversity, equity, and inclusion in environmental education [370]; another an expert-derived evaluation framework for DEI in relation to recruitment processes [371]; a third the *Thinking Ahead, Resource Provision, Evaluation, Equity* (TREE) model [372]; a fourth a tool that would allow graduate medical education (GME) programs to evaluate the current state of DEI within their residencies [373]; the fifth a realist evaluation framework and a logic model [374]; and the sixth investigating the benefits and constrains of the Athena SWAN program in one medical school, concluding that "Gender equity programmes have the potential to address inequity. However, paradoxically, they can also unintentionally reproduce and reinforce gender inequity through their enactment" and that Athena SWAN's positive effects can be undermined by "wider institutional practices, national policies and societal norms" [375] (p. e012090). The moral evaluation of equality, diversity, and inclusion was seen as an under-theorized field [376]. One study argued that the "lack of consideration for DEI variables may limit the ability of app-based interventions to serve marginalized communities, or even worse, create new disparities. Therefore, we provide recommendations to improve current app evaluation frameworks' cultural robustness and clinical utility, maximizing their effectiveness when working with individuals from marginalized communities" [377] (p. 1). One study found that "Athena SWAN members showed greater and faster growth in female representations. Silver awardees had greater university performance than Bronze awardees" [378] (p. 1). Another using the American Society of Engineering Education (ASEE) data assessing "the changes in the representation of full-time tenure-track women faculty in engineering colleges" showed uneven success in general and with institutions funded by the NSF ADVANCE program [379].

As for the 1150 abstracts obtained through strategies 1 and 2, we obtained 18 relevant abstracts with the keyword "assessment". In one abstract, it was highlighted that the assessment of the Department of Civil and Environmental Engineering at Carnegie Mellon University concluded that "DEI into the classroom and the department stimulates higher level thinking on the Bloom's Taxonomy scale, greater engagement, and can promote a more inclusive and equitable learning environment" [336] (p. 1). One abstract referred to researchers conducting a self-study (NSF ADVANCE #0811076) from 2008–2011 to identify career advancement barriers for current women faculty, which "led to the identification of barriers in the areas of career navigation, climate, and flexibility in work/life management balance", and "the effectiveness of existing university structures at addressing these barriers was assessed", leading to a detailed institutional transformation strategy" [380]. One argued that "the education and training of chemists requires a reassessment of how academic programs integrate diversity, equity, and inclusion (DEI) as a core principle of educational quality" [381] (p. 393). Two covered need assessments related to DEI [382,383], while others covered assessment of DEI outcomes in hospital medicine [364], pediatric residents [341],

academic radiation oncology department chairs' insights into DEI [384], radiology [385], the construction industry [386], and "perceptions of gender equity among SAGE Athena SWAN self-assessment team members in a regional Australian university" [387] (p. 356); see also [388]). In one abstract, it was argued that racial climate assessment in higher education often fails to consider the unique history, structure, and issues related to diversity, equity, and inclusion of historically Black colleges and universities (HBCUs) [389] (p. n2); one argued that it is unclear which existing assessment tools capture DEI factors [377]; and a third focused on developing tools for EDI for Graduate Medical Education Programs [373]. One abstract covered a climate assessment activities in support of the development of a college-level diversity, equity, and inclusion (EDI) action plan [390], and one stated that one should make "the diversity, equity, and inclusion mindset indispensable in the classroom through design, content, communication, and assessment for Library and Information Science" [391] (p. 63). In one abstract, it was stated that "the value of EDI education for universities, especially in Canada, has not before been subject to scholarly assessment" [392] (p. 51) without listing the conclusion in the abstract.

As for the 531 abstracts obtained through strategy 4, we found 10 relevant abstracts with the keyword "evaluation". One was about how to measure DEI, arguing that the three concepts have to be measured and dealt with individually [393]; one stated that effective measures are needed for DEI [394]; one covered the EDI evaluation of the Clinical Scholars National Leadership Institute (CSNLI) [395]; one focused on the patient perspectives of the climate of diversity, equity, and inclusion in the emergency department [396]; one centered on DEI evaluation of DEI trainings for medical school faculty [397]; one covered the evaluation of a DEI climate survey in a School of Engineering [398]; and one covered the EDI literacy of people involved in sport and exercise psychology and argued that minority groups have to be involved in the EDI design and evaluations of training and research [399]. In one abstract, it was noted that prior diversity activities were evaluated to inform the set-up of the Office of Health Equity and Inclusion (OHEI) [400], and a second abstract covered the evaluation of the "graduate certificate for professional development in DEI" [401] (p. 1). In one abstract, it was stated that "This study aims to inform the development of a post-occupancy method to evaluate Inclusion, Diversity, Equity and Accessibility (IDEA) in the built environment. This article reports the results of a multifaceted Delphi study which culminated with co-designing the IDEA audit, a post-occupancy evaluation method to collect data on people's perceptions of inclusion, diversity, equity, and accessibility. With the IDEA audit, researchers, building owners, design teams, developers, facility managers, tenants, and organisation leaders can achieve a baseline of understanding of what people feel in regard to inclusion, diversity, equity and accessibility, clearly identify pockets of inconsistency and use data to decide how to address challenges and points of exclusion" [402] (p. 1).

As for the 531 abstracts obtained through strategy 4, we obtained 5 relevant abstracts with the keyword "assessment". One argued that one should conduct a staff needs assessment survey to determine perception of inclusion and clinical preparedness in DEI topics and provide targeted education and identify opportunities for professional growth [403]; one highlighted the completion of a DEI self-assessment known as the equity environmental scanning tool to guide action plans for professional STEM societies [404]; a third covered a DEI climate assessment survey for an emergency department covering patient views [396]; the fourth argued that DEI faces many barriers, with one being the lack of effective assessment tools for DEI initiatives [398]; and the fifth focused on "refining a DEI Assessment Tool for Use in Optimizing Professional STEM Societies for Gender Equity" [405] (p. 1).

#### 3.3.8. Well-Being

As for the 1150 abstracts obtained through strategies 1 and 2, we found 5 abstracts that engaged with well-being within the framework of EDI phrases or policy framework. One abstract suggested that engaging with the interplay of social support, racism and discrimination, and well-being and burnout helps to discuss effective solutions to diversity,

equity, and inclusion [406]. One study aimed to explicitly add to the "well-being, diversity, equity, and inclusion" dialogue of the post-pandemic era covering self-identity and work and family conflicts [407] (p. 1). A third stated that professional fulfillment and well-being of women physicians can be improved by promoting, measuring, and improving diversity, equity, and inclusion [408]. One explicitly put forward the notion that DEI initiatives should "include employee and family health and well-being as a central outcome measure" [245] (p. 609). Finally, the fifth stated that "Worksite health and well-being initiatives will ideally be integrated with employers' efforts to address diversity, equity and inclusion" [409] (p. 893).

As for the 531 abstracts obtained through strategy 4, we found 5 relevant abstracts. In one abstract, it was argued that equity-, diversity-, and inclusion-based workplace discrimination impacts workers' well-being, especially women and visible minorities [410]; one linked improving DEI to improving well-being [411]; one argued that the "time and effort tax" on Black faculty to engage in DEI efforts in academia and biomedicine impacts their well-being [263] (p. 1); one discussed that law firms must take into account lawyer well-being as an institutional piece of their diversity, equity, and inclusion [280]; and one focused on the setup of a "Diversity, Equity, and Inclusion (DEI) committee for the well being" in a correction agency [359] (p. 9).

#### 3.3.9. Health Equity

As for the 1150 abstracts obtained through strategies 1 and 2, we found 9 abstracts with relevant content. One study reported on the set up of an Office of Health Equity and Inclusion (OHEI) at a pediatric academic medical center and on the health equity, diversity, and inclusion (EDI) initiatives in creating the OHEI [400]. One concluded that "diversity, health equity, inclusivity, and cultural humility can be effectively taught by an innovative mass simulation effort" [412] (p. S102). One argued that diversity, equity, and inclusion is essential for future nurses to deliver culturally competent care and promote health equity [413] (p. E90). One reported that regional business leaders strongly supported health equity, diversity, and inclusion initiatives both as moral obligations and regional economic development imperatives [414] (p. 1665). In three abstracts, the phrase "health equity, diversity and inclusion" was used, and it was argued that it should be engaged more [277,415,416]. In one abstract, the DEI Institute was highlighted as a positive example of how to deal with health equity [417], and in a second abstract, it was argued that DEI empowered staff to engage improve actions towards health equity [241].

As for the 531 abstracts obtained through strategy 4, we found 3 relevant abstracts. In one abstract, it was argued that engagement with health equity as measured by the presence of "diversity, equity and inclusion (DEI) and health disparities related to social determinants of health (SDH)" is lacking in "scientific neurological journals", and that study compared the presence of DEI and SDH in neurology and neurological versus medical journals [418] (p. 1). The second was about an "Assessment of Diversity, Inclusion, and Health Equity Training in Endocrinology Fellowship Programs in the United States", to give the title of the article [419] (p. 1), and in the third, it was noted that prior diversity activities were evaluated to inform the setup of the *Office of Health Equity and Inclusion (OHEI)* [400].

#### 4. Discussion

#### 4.1. EDI Actors, Phrases, Frameworks, and Groups

In this section, we first discuss our findings related to the EDI phrases and frameworks, then our findings around EDI groups, and then our result related to EDI actors.

#### **EDI Frameworks and Phrases**

Many EDI-related phrases [1–22] and EDI policy frameworks [23–37] exist. As for the 1150 and 531 abstracts that contained EDI policy frameworks or EDI phrases, we found an uneven presence of the policy frameworks (only Athena SWAN, UK and NSF advance, USA) and phrases (Table A1), suggesting a gap in the academic analysis of the utility of

EDI phrases and policy frameworks. As for the 781 abstracts from the journals that contain "equality, diversity and inclusion" in the title of the journal, we found even fewer to no mentions of EDI policy frameworks and phrases (Table A1). Although the journals use one of the phrases in their title, one would expect the abstracts to mention the phrases or frameworks if a given phrase or framework is the focus of the study. Our findings for all sets of abstracts suggest many opportunities for the evaluation of actions performed under the EDI phrases and EDI policy frameworks.

#### **EDI** Groups

The academic journal *Equality, Diversity and Inclusion* states as its aim that "The advent of legal and social reforms in the field, as well as the broadening of the theory of equal opportunities to include a wider range of inequalities based on sex, race, disability status, age, sexual orientation, marital status, nationality and social class have all contributed to the general growth of scholarly interest in the field" [60]. However, as for EDI groups, we found in all sets of abstracts that terms linked to women and terms depicting ethnic groups were the dominant terms mentioned, whereas terms linked to disabled people, LGBTQ2S+, and Indigenous peoples were rarely mentioned (Table A2). Reflecting our findings around EDI groups, we also found hierarchies in the mentioning of isms and phobias, with racism being mentioned the most, with others such as ableism, disablism, colonialism, homophobia, and transphobia mentioned much less (Table A2). Interestingly, the term "sexism" was mentioned much less than the term "racism".

This hierarchy of mentioning fits with the NSF ADVANCE webpage that mentions only women and racial and ethnic minorities even in the context of intersectionality [29]. This raises the question as to what data if any exist that have looked at the impact of the NSF Advance program on other EDI groups such as disabled people who are not mentioned on that part of the NSF advance webpage and what may be the result so far for the different intersectionalities mentioned for the non-mentioned EDI groups. On the same webpage, it is stated, "All NSF ADVANCE proposals are expected to use intersectional approaches in the design of systemic change strategies in recognition that gender, race and ethnicity do not exist in isolation from each other and from other categories of social identity" [29]. Who are these other categories of social identity?

Our findings of a hierarchy of mentioning of EDI groups fits with other studies that have looked at EDI and disabled people [1] and EDI as it relates to sports, kinesiology, physical activity, and physical education [420]. Our findings indicate that the hierarchy of EDI groups is a general problem within EDI academic inquiries. Given that it is argued on the "See change with STEMM Equity Achievement" page of the American Association for the Advancement of Science (AAAS) webpage that "one of the most challenging issues facing higher education today is cultivating diverse campus communities that are truly equitable, accessible, and inclusive" [33] and that the webpage of the *Canadian Dimensions: equity, diversity and inclusion Program* states that "the Dimensions program addresses obstacles faced by, but not limited to, women, Indigenous Peoples, persons with disabilities, members of visible minorities/racialized groups, and members of LGBTQ2+communities" [36], as cited in [1], the gap we reported should be filled.

This hierarchy of mentioning of EDI groups is disempowering for the EDI groups mentioned less. Empowerment is situated within the context of social change [97–103,421], as is disempowerment [104–106]. Our data suggest that social change seen as needed within EDI academic inquiry is focused much more on race and gender than other EDI groups. Empowerment is linked to individuals as social change makers [107] and groups, organizations, and communities [101] and covers the enhancement of social change through empowerment [108] and empowerment for social change [109–113]. Our findings suggest an uneven empowerment of individuals and groups within the EDI academic inquiries. Indeed, the present social hierarchies evident in relation to EDI groups disempowers EDI groups in general, as it, for example, contains the danger of conflicts between the EDI groups, taking away from the goal of fixing the systemic problem.

#### **EDI Actors**

As for actors of EDI, we found few phrases indicating a concrete workplace, and along with that, actors linked to a specific workplace were mostly invisible (Table A3). We found various associations, societies, journal names (Table A4), universities, and colleges (Table A5) mentioned, but most of them were only mentioned once. As for academic departments, science was mentioned the most, followed by STEM and engineering (Table A5). On the other hand, social science or arts were rarely if not at all mentioned in conjunction with departments or faculty names. Indeed, the term "arts" was mentioned more in the context of non-academic organizations than universities, such as "Faculty of Art(s)" (Table A5). Many different facets of medical professions and specialties were mentioned (Table A6).

As such, our data of actors show an uneven visibility of disciplines and organizations associations, societies, and journal names linked to disciplines (Tables A4–A6) as actors of implementing EDI. Given that most of our 1150 abstracts are from 2021–2022 and that the findings are also reflected in the 531 abstracts added in our November search, our findings around EDI actors are puzzling. Although some EDI policy frameworks still focus on STEM(M) [23,30,33], by now, there are many university-based EDI/DEI programs and EDI policy programs that have moved beyond STEM(M) [27,422]. The Dimensions Charter notes that EDI applies to all disciplines [27], and the academic journal *Equality, Diversity and Inclusion* states under its aim that "Equal opportunities and its allied concepts, including inequality, inequity, disadvantage, diversity, and inclusion, have been studied extensively across all disciplines of social sciences and humanities" [60]. Indeed, many of the authors of our abstracts come from non-medical and non-STEM faculties and departments (data not shown); however, these abstracts do not mention these departments and faculties as actors of EDI actions related to their departments. We suggest our findings as representing one barrier to achieve cultural change in the envisioned research ecosystem [38].

#### The Issues of Evidence

Many EDI policy frameworks state that evidence and data are important [24–31,37] and that systemic changes are needed [25–29,31]. However, our data show gaps of evidence in many areas. The question is the following: Does the data not exist, or are our results another example of a disconnect between what is published as academic studies and as policy reports? What evidence and data are used to inform EDI practices? For example, does evidence exist that answers the following questions? How are marginalized groups that are not focused on impacted by the focus on a specific marginalized group? What is the effect of such an approach on the relationship between marginalized groups? Under disability/impairments, many different characteristics are covered within EDI [1,423], many of which are not engaged with in the EDI academic inquiry (Table A2). All these "disabilities"/"impairments" have different lived experience and realities that pose different challenges in which EDI policies must work. Not only that, but if one tallies them up, the total numbers could reflect more than 40% of the university population [1] depending upon what general population incidence numbers one uses for the different "characteristics". Furthermore, many of the characteristics increase by age, such as diabetes and chronic pain and other medical conditions, which could inflate the success of having disabled people in leadership positions. Given that the National Science Foundation 2019 report "Women, Minorities, and Persons with Disabilities in Science and Engineering" gave one number for disability that reflects people who, for a given activity, are impacted as "moderate", "severe", or "unable to do" [424], one wonders what the difference in numbers are for, for example, moderate walking issues such as limping and for the more severe category of being unable to walk. The EDI issues that these two groups face are totally different.

What knowledge is accepted as evidence or thought to be generated is important for being a social change agent [114], as knowledge empowers [115,116]. Our data suggest that there is an evidence hierarchy related to EDI groups that is disempowering the less-mentioned EDI groups. If it is needed for empowerment "to improve people's lives by providing a controlling understanding of social, economic, and political forces" [117]

(p. 5047), the EDI group hierarchy we found suggests problems for the goal of EDI related to various EDI groups. Empowerment is in particular needed for marginalized groups and a way to address the problems the powerless face, including being powerless [157,163,164], such as experienced by disabled people [115,165–172]. Our data suggest that the academic EDI discourse is disempowering for many marginalized groups covered under EDI. EDI documents of many universities, companies, and non-governmental organizations use the term empowerment (for example, [179–182]). Our findings suggest that the academic inquiry reality is disempowering. It is argued that "radical empowerment theory, which relates discriminatory social relations to societal discourses", should be employed in education [178] (p. 401). Using empowerment theory might be therefore a useful lens for EDI inquiries and evaluations. Our data around actors and EDI groups suggest that we lack the evidence to evaluate the state of systemic change achieved or to ascertain where the problems still are.

#### 4.2. EDI, the Workplace, and the "Social"

Many EDI policy frameworks state that systemic changes are needed [25–29,31]. The Canadian EDI framework for post-secondary workplaces states the following:

"Dimensions: equity, diversity and inclusion Canada invites you to take part in a post-secondary transformation to increase equity, diversity and inclusion (EDI) and help drive deeper cultural change within the research ecosystem" [36].

Many external factors impact how the workplace is experienced [76,77,85–93,425]. The term life administration [47] was coined to flag the many external issues people have to deal with, in particular, people not fitting a given norm. It is argued that disabled people experience three types of life admin: medical admin, benefits admin, and discrimination admin (disability admin) [48]. Marginalized groups covered under EDI divert from given norms and as such face specific lived experiences impacting how they experience a workplace that only assumes and considers normative lived experience. Our terms linked to the social (Tables A7–A14) signify external factors that could impact EDI realities within the workplace and could have been used to discuss the external factors that impact the marginalized groups covered under EDI actions and policies.

Our findings suggest that actions undertaking under the headers of EDI policy frameworks and phrases are not analyzed with many external factors of the "social" in mind. It is noted in the literature that "research evidence suggests that faculty members' well-being is a serious concern in academia" [425] (p. 559). However, only 10 abstracts made the linkage between well-being and EDI [245,263,280,359,406–411] in Section 3.3.8.

Work/life balance is an indicator of the "Better life index", but only three abstracts linked it to EDI in a substantial way, whereby all three saw work–life to mean work–family [242,322,323]. It is noted that the academic inquiries into work/life balance are too much focused on work/family life and that it has an unevenness of engagement with marginalized groups [77] and a lack of engagement with intersectionality [77]. Our study suggests the same problem with the scope being work/family. Given our EDI group unevenness of mentioning, if more studies were linking EDI to work/life, the result very likely would reflect the same problem around marginalized groups as stated for the work/life coverage in general. However, as it stands, work/life is not even a topic to start with.

Health equity was mentioned in a relevant context in 13 abstracts, whereby the phrase "health equity, diversity and inclusion" was the dominant one. All the abstracts were linked to medical/health professions. However, given the WHO definition of health equity, namely "the absence of unfair and avoidable or remediable differences in health among population groups defined socially, economically, demographically, or geographically. In essence, health inequities are health differences that are socially produced, systematic in their distribution across the population, and unfair. Identifying a health difference as inequitable is not an objective description, but necessarily implies an appeal to ethical norms" [426] (p. 12), and others stating that "health equity is about the "freedom to live

a long and healthy life" and "the material, psychosocial and political empowerment of individuals and communities", whereby "these dimensions of empowerment are influenced by the way society chooses to run its affairs, which shape the conditions in which people are born, live, work, play and age. Daily living conditions affect peoples' opportunities, their chances, the ways they behave and feel, and ultimately their health" [427], as cited in [57], the definitions suggest that health equity could be a useful concept in the academic inquiry of EDI beyond the medical/health professional workplace. Given these definitions, how EDI is implemented at the workplace is impacted by the health equity reality of people outside of the workplace, but a non-functioning EDI at the workplace also would contribute to health inequity within and outside of the workplace. We also suggest that the very 21 composite measures we searched for (Table A9) must be considered more. All these composite measures provide indicators that allow for a differentiated evaluation of the external factors that EDI-deserving individuals face, which would allow for a better understanding of work–life realities beyond the limited use of work–life meaning work– family issues. Health equity and the 21 composite measures are also useful for EDI policy development for the workplace in general given that mental health and the well-being of people at the workplace is an issue flagged by many academic studies, and it fits with the view that one has to deal with disadvantages based on one's social position and other social parameters ([428–431], as cited in [57]).

The hierarchy of coverage of different EDI-deserving groups we found could have been engaged with using the very term "hierarchy", which by itself only generated 16 abstracts within the 1150 and 531 abstracts, and many of the social terms we covered in our search terms, such as "solidarity", "stereotype", "stigma\*", "social norms", "social status", "social integration", "social inclusion", "social identity", "peer support", "prejudice", "self worth", and "self respect", could also have been used to that end. Another term of importance to the EDI discourse, especially for disabled people, is "reasonable accommodation", a term used in the American with Disabilities Act but also the Conventions on the rights of persons with disabilities. Many see this concept to be used in a negative way against disabled people in the workplace and see problems with workplace accommodation [432,433]; however, the term did not appear in any of our abstracts. One study indicated that one problem with even requesting accommodation is that disabled people fear disclosing their disability [433]. Disability disclosure is a recognized problem at the workplace [434]. Disability disclosure is also an acknowledged problem within higher education for disabled students [435] and faculty [436]. That many do not disclose if they can avoid it might make sense given, for example, that "35% of disabled university professors, instructors, teachers, or researchers experienced unfair treatment or discrimination in the past 12 months, and 47% saw themselves subjected to at least one type of harassment in the past 12 months" [437], as cited in [1]. In general, the statistics shows high levels of harassment and unfair treatment also for other EDI groups [437]. Another study looking at Canadian federal public service workers found that 18% experienced harassment and 8% discrimination. The numbers were 37% and 26% for disabled workers, whereby the numbers are even higher for disabled people that belonged to other EDI groups such as visible minorities and Aboriginal peoples [438]. The same study noted that their numbers are in line with other studies from the UK and USA [438]. Given these statistics, it seems to be prudent to cover EDI much more through "social" terms such as "solidarity", "stereotype", "stigma\*", "social norms", "social status", "social integration", "social inclusion", "social identity", "peer support", "prejudice", "self worth", and "self respect" for the EDI groups and through the term "intersectionality". What would solidarity entail from one EDI group to another or from the so-far-dominant groups?

Empowerment is covered in relation to determinants of health [120–125], community-based rehabilitation [126,127], as an outcome measure of rehabilitation [128], the flourishing scale [129], the capability approach [130–132], and wellbeing [133–143]. Various lists of attributes, indicators, and measures of empowerment exist [119,144–149], many of which

are part of our list of terms linked to the "social". As such, our findings indicate a missed opportunity to engage with factors influencing empowerment.

It is argued that "radical empowerment theory, which relates discriminatory social relations to societal discourses", should be employed in education [178] (p. 401). We suggest that empowerment theory could also be useful to employ in engagement with EDI.

#### 4.3. EDI and Governance of Sciences and Technologies

Our study found that EDI phrases and frameworks are often discussed in conjunction with STEM, engineering, and medicine. STEM, engineering, and medicine are three areas that are impacted by and impact advancements in science and technology. The "social" is often listed as part of the phrase "ethical, legal, social implications" of a given scientific or technological advancements and is one focus of governance of science and technology discussions [49–59]. As such, the question is as follows: Which technologies and which science and technology governance terms and ethics fields are present in the EDI academic inquiry: Our data suggest that although STEM, engineering, and medicine are the main identified actors in the abstracts we covered, the impact of technologies on EDI and the impact of EDI implementations on technologies were rarely present (Table A15), and if mentioned, it was with a purely techno-optimistic tone (Section 3.3.2). As for technologies, we found only four hits with the terms "assistive technology" OR "assistive technologies" OR "assistive device" OR "assistive devices" (Table A10), with none in the 1150 and one in the 531 abstracts and three in the 781 abstracts. Just using the phrase "assistive technolog\*" generated no hits for the 1150 abstracts, one hit in the 531 abstracts and two in the 781 (Table A15), suggesting a gap in relation to disabled people within the EDI literature. Many problems have been reported around assistive technologies and disabled people [439], and many assistive technologies are on the horizon [440]. Due to the COVID-19 pandemic, we saw a shift in use of certain technologies, many of which, such as video platform, could be classified as assistive technologies for everyone.

Furthermore, ethics and science and technology governance terms were not linked to EDI inquires (Table A15), which we see as a gap in the EDI engagement given the social impact of science and technology on EDI groups. A recent study looked at "computational Intelligence (CI) as an assistive technology for Equity, Diversity, and Inclusion (EDI)" [96] (p. 1) and argued "that the nature of EDI scenarios and their modeling requires CI approaches and techniques" [96] (p. 1). They introduced three levels of questions for machine reasoning: "What is? What if? Why?" [96]. How these questions are answered depends on what data the machine reasoning has access to as to EDI. Our data suggest that the CI system for EDI will not have the unbiased differentiated data needed for the EDI CI to provide a decent algorithm for EDI outcome.

#### 4.4. Limitations

Our scoping review has various limitations. Our search was limited to three academic databases and abstracts of English-language academic literature. In addition, we used the EDI phrases and frameworks of which we were aware, but other phrases might exist to indicate initiatives to change the "social" of marginalized groups at the workplace, including at universities. As such, the findings are not to be generalized to the whole academic literature, non-academic literature, or non-English literature. As for our hit counts, even the number of abstracts recorded does not mean that the search term was used in conjunction with EDI content. As such, the hit counts are a maximum and will in most cases be lower if analyzed for being linked to EDI. For our qualitative methods, we chose certain keywords for the upper-level themes (for example evaluation and assessment). However, other terms exist that could also fit the theme of evaluation and assessment. We also used only certain terms for the qualitative analysis. Given the quantitative hit counts, one could have also chosen other terms for the qualitative analysis. Despite the limitations of the study, the findings, however, allow for conclusions to be made within the parameters of the searches. As for transferability, the description of our method gives all

the required information to others, so they may decide whether they want to apply our keyword searches to other data sources such as grey literature, literature in other languages, and other academic literature or whether they want to perform more in-depth research such as thematic analysis of certain search terms for which we provided hit counts but no thematic analysis.

#### 5. Conclusions, Implication, and Future Research

The academic journal *Equality, Diversity and Inclusion* states under aim of the journal that "It is important to acknowledge that there are some dichotomies between the reality and rhetoric of equal opportunities, the forms of practitioner and the academic knowledge in the field, scholarly approaches to equal opportunities across disciplines of social sciences and humanities, as well as their use of concepts and methods in order to uncover inequalities, and offer strategies for change towards equality of opportunity, valuing of diversity or pursuit of social inclusion" [60].

Our data suggest that there are vast gaps in how the academic EDI inquiry deals with the "social" and science and technology and vast differences as to which academic disciplines and EDI groups are covered. The term workplace is mostly used in a general way and not to indicate a specific workplace.

The following is stated for the university within a Canadian context:

"Systemic barriers within academia and the research ecosystem are well documented in Canada. To address these persistent barriers within Canada's research ecosystem, individuals at all levels (e.g., students, trainees, faculty, researchers, administrators, research funding agencies, policy-makers) must play a sustained role in identifying and mitigating them. All individuals must recognize that systemic barriers exist, develop a strong understanding of what the barriers and their consequences are, and understand how individuals at all levels of the research ecosystem (including researchers) can play a role in addressing them". [28]

Our data might be useful for all the groups mentioned and for the actions envisioned in the quote (we see the problems highlighted in the quote as not only Canadian problems and the action items as not only needed for Canada). Furthermore, using the sentiment of the quote, our data should also be of use to people of all backgrounds and in non-academic workplaces.

As for academic implications, our study suggests that the EDI inquiry has to diversify and fill the many gaps we identified. As for policy implications, our findings suggest that EDI data are missing to make EDI-focused, evidence-based policy decisions. As for educational implications, our findings suggest that the EDI data available do not give educators in many subject areas and fields and workplace settings the data to be able to look at many topics through an EDI lens and increase the EDI literacy of students and others.

Our results suggest needs and opportunities for many studies.

First, given our approach to generating the data, various studies can be undertaken that analyze in detail the content of the full articles related to, for example, Athena SWAN or many of the keywords for which we generated hit counts.

The authors of one abstract in our data covering EDI in India made clear that EDI frameworks have to be adapted to be locally relevant and be culture-sensitive [441]. This suggests an opportunity for various qualitative studies and studies that look at non-English literature.

Studies that compare the EDI situation of different EDI groups within a given work-place and the impact of a given framing of policies for each of the EDI groups are needed.

Studies that cover the neglected EDI groups, including the intersectionality between different characteristics that make one to belong to more than one EDI group, are needed.

Studies are needed that generate total % numbers of disabled people of the total workforce and, with that, re-evaluate the % goals for the presence of disabled people as a group that is seen as an EDI success (the numbers used in the moment are too low). Depending on who is covered under disability within a given EDI effort or framework, the

actual % the "disability" group would represent at the workplace would be different. If one sums up all the incident numbers in the population of the listed "disabilities" mentioned in [1,423] as belonging to the EDI group of disabled people, the number could be 40% of the workplace population in many countries, and the numbers very likely are different for different places.

Studies are needed that differentiate between the different "disabilities" and what their EDI realities are in a given workplace setting. Even existing differentiations such as making a difference between mobility versus visual disability is not enough because, for example, the mobility reality of limping versus not walking leads to different EDI challenges. With that, studies are needed that produce data on which disabilities are making up the numbers if a certain EDI % goal is achieved, such as disabled people in leadership positions.

Studies are needed to analyze how to decrease the harassment, microaggression, and other problems EDI groups still experience. Linked to that, work is needed regarding how to increase self-disclosure, which is very low for disabled people. Other research that might be useful is to engage with the very meaning of the term accommodation and how its use benefits already ability-privileged people [1].

Studies that engage more with the external factors of the lived experience of EDI-covered groups and build the external problems into EDI strategies are needed. These studies need to broaden the focus of work/life away from work/family to work/general life reality and cover all groups covered under EDI, which is in line with others stating that the focus of work/life engagement has to broaden [77]. Such studies can bring in groups that work on the "social", whether it is the groups involved in health equity or composite measures of wellbeing or the very concept of well-being and others involved in the "social" in a given area. Such studies also can broaden and strengthen the EDI research community, enrich the EDI research and policy scope, and generate EDI policies that are less siloed from the external world and will help in addressing the systemic problems and contribute to a cultural change in the education, service, and research ecosystem.

More studies that evaluate EDI efforts within the workplace including on levels of individual workplaces and within academia on the level of individual faculties/departments are needed, and existing studies have to be more frequently introduced into the academic literature. The barriers that EDI groups experience and the potential solutions are not the same for all academic disciplines or workplaces of different categories. Efforts such as the Canadian equity, diversity and inclusion Dimensions pilot program [38] will provide a great deal of data that could enrich academic studies and provide information on best practices, gaps, problems, and the work that is still needed.

Studies that look at issues such as adaptation burnout as something that can be seen as a potential outcome of marginalized groups having to constantly adapt to the non-marginalized groups might be useful.

Studies that investigate in a differentiated way the role of technologies not only as assistive tools for EDI but also their impact on the external factors would be useful, whereby these analyses should include an evaluation of a given technologies on different EDI groups. Even within the EDI group of disabled people, the impact of a given technology (within and outside the workplace) is different for different groups of disabled people.

Studies that link ethics fields and science and technology governance concepts to EDI efforts would be useful given that science and technology governance and ethics fields already engage with the "social", which in turn impacts EDI efforts and EDI groups in different ways.

Given that there are efforts to develop algorithms and computational intelligence for EDI [96], studies are needed that evaluate existing algorithms and computational intelligence for EDI evaluations.

Various self-assessment tools are reported (Section 3.3.7). However, there is still a need for more studies that develop self-assessment tools, so people at the workplace can become much more literate on EDI and realize their own biases and what they do not know. A meta-analysis of all self-assessment tools available could be useful. One tool not used as

an EDI self-assessment tool but could be one is the BIAS FREE (Building an Integrative Analytic System for Recognizing and Eliminating inEquities) framework [442,443]. The BIAS FREE framework allows people to identify biases in the environment they are in [444] and includes EDI realities and the differences between EDI groups.

Studies are needed that audit course outlines for possibilities to add EDI content.

Finally, given that the lack of EDI is often a consequence of a privileged group setting up irrelevant ability expectations [1], the ability expectation lens might be useful for looking at EDI in a non-siloed way.

**Author Contributions:** Conceptualization, G.W.; methodology, G.W.; formal analysis, G.W. and A.N.; investigation, G.W. and A.N. data curation, G.W. and A.N. writing—original draft preparation, G.W.; writing—review and editing, G.W. and A.N.; supervision, G.W.; project administration, G.W. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

**Informed Consent Statement:** Not applicable. **Data Availability Statement:** Not applicable.

**Conflicts of Interest:** The authors declare no conflict of interest.

#### Appendix A

**Table A1.** Frequency of EDI Phrases and Policy Frameworks.

EDI Terms, Phrases, and Policy Frameworks (Selected Based on Existing Literature)	Frequency in the 1150 Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 531 Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
	EDI policy framewo	orks	
"Athena SWAN"	45	6	0
"NSF ADVANCE"	58	3	7
"See change with STEMM Equity Achievement"	0	0	0
"Dimensions: equity, diversity and inclusion"	0	0	0
"Science in Australia Gender Equity"	0	0	0
	EDI phrases		
"Diversity, equity and inclusion"	768 (hits)	405 (hits)	1
"Equity, diversity and inclusion"	297 (hits)	123 (hits)	3
"Equality, diversity and inclusion"	127 (hits)	74 (hits)	37
"Justice, equity, diversity, and inclusion"	50	14	0
"Diversity, equality and inclusion"	16	4	1
"Inclusion, diversity, equity and accessibility"	5	3	0
"Diversity, equity, inclusion and belonging"	4	11	0
"Equity, diversity, inclusion, and accessibility"	1	0	0
"Equity, diversity, inclusion, and decolonization"	0	0	0
"Belonging, dignity, and justice"	0	0	0
"Diversity, dignity, and inclusion"	0	0	0
"Inclusion, diversity, equity and accountability"	0	0	0

Table A1. Cont.

EDI Terms, Phrases, and Policy Frameworks (Selected Based on Existing Literature)	Frequency in the 1150 Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 531 Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
	Individual EDI ter	ms	
Accessibility	18	13	5
Accountability	17	8	2
Belonging	16	22	6
"Decoloniz*"	7	0	1
Dignity	4	0	3
Diversity	2350 (hits)	1527 (hits)	2213 (hits)
Equality	387 (hits)	194 (hits)	1267 (hits)
Equity	1733 (hits)	1156 (hits)	106 (hits)
Inclusion	1846 (hits)	1209 (hits)	1252 (hits)
Justice	250 (hits)	184 (hits)	31

Table A1 shows that there was a very uneven coverage of the EDI phrases and EDI policy frameworks in the abstracts obtained through strategies 1–4.

**Table A2.** List and frequency of EDI-related groups, isms, and phobias (many terms linked to disabled people taken from [423] (p. 38)).

List of EDI Groups	Frequency in the 1150 Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 531 Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
	EDI-groups-related terms		
ADHD	1	0	0
"African-American"	13	11	5
Addiction	3	0	1
"Anxiety disorder"	0	0	0
Asian	23	14	7
"Attention deficit"	0	0	0
Autism	0	2	2
"Autism spectrum disorder"	0	2	0
Black	252 (hits)	155 (hits)	209 (hits)
"Chronic disease"	1	0	0
"Chronic pain"	1	0	0
"Comprehension disability"	0	0	0
Deaf	4	1	3
Depression	5	2	110 (hits)
Diabetes	1	0	0
"Disabilit*"	39	14	41
Disabled	9	5	4
"Disabled people"	3	2	1
Disease	20	8	4
Dyslexia	0	0	2
"Ethnic*"	227 (hits)	161 (hits)	266 (hits)
Gay or lesbian or "homosexual*"	18	8	30
Gender	625 (hits)	236 (hits)	1428 (hits)
"Hearing impairment"	0	0	0

Table A2. Cont.

List of EDI Groups	Frequency in the 1150 Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 531 Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
Hispanic*	21	7	2
"HIV/AIDS"	1	0	2
Impaired	1	0	0
Impairment	1	0	2
"Indigenous People*" OR "Aboriginal*" OR "First Nation*" OR Metis or Inuit or "Native American*"	5	9	5
"Latin*"	2	0	
"Learning disability" OR "learning impairment"	0	0	0
"LGB*"	27	12	18
"Medical condition"	0	0	0
"Mental health"	22	12	10
"Mental illness"	1	1	4
"Neurodiv*"	7	2	1
"Of color"	112 (hits)	25	13
"People with disabilities"	5	4	11
"Physical disability"	1	0	1
Race	174 (hits)	47	155 (hits)
Racialized	10	8	6
"Racialized minorit*"	3	0	0
Schizophrenia	0	0	0
"Speech impairment"	0	0	0
Transgender	12	6	13
"Visible minorit*"	0	2	0
"Visual impairment"	0	0	0
Wheelchair	1	0	0
Women	679 (hits)	151 (hits)	1178 (hits)
EDI-related isms and phobias (I	ist of isms and phobias found by readi		
"*ism*"	428 (hits, not all relevant)	291 (hits, not all relevant)	629 (hits, not all relevant)
Ableism	2	4	0
Activism	11	2	14
Ageism or agism	2	0	3
"Anti-racism"	21	9	3
Colonialism	3	3	2
Disablism	0	0	0
Elitism	1	1	0
Feminism	3	3	13
Feminism  Globalism	3	3	13 0
Globalism			
Globalism Homophobia	1	0	0 12
Globalism	1	0	0
Globalism Homophobia Imperialism	1 4 2	0 4 0	0 12 2 1
Globalism  Homophobia  Imperialism  Interculturalism  Multiculturalism	1 4 2 1	0 4 0 0 1	0 12 2 1 0
Globalism Homophobia Imperialism Interculturalism	1 4 2 1	0 4 0 0	0 12 2 1

Table A2. Cont.

List of EDI Groups	Frequency in the 1150 Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 531 Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
Profeminism	1	0	1
Professionalism	9	1	5
Racism*	209 (hits)	140 (hits)	175 (hits)
Sexism	8	8	4
Supremacism	1	0	1
Tokenism	2	0	5
Transphobia	3	3	9
Universalism	2	0	2

Table A2 reveals a range from very uneven to no engagement with EDI groups and uneven presentation of isms and phobias related to EDI. Our list did not contain irrelevant words containing ism, for example "mechanism" or "dismantling", to name two.

**Table A3.** List of workplaces in abstracts obtained through strategies 1-4(list of terms found by reading all the abstracts from strategies 1 and 2).

Workplaces as Evident in the Phrase	Frequency in the 1150 Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 531 Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
"Workplace*" general term	80	22	155 (abstracts)
"Aviation workplace"	1	0	0
"Engineering workplace"	2	0	0
"Faculty workplace	1	0	0
"Healthcare workplace	0	1	0
"Higher education workplace	1	0	0
"Library workplace"	0	2	0
"Medical physics workplace"	1	0	0
"Midwifery workplace"	1	0	0
"Prison workplace"	0	1	0
"Radiology workplace"	1	3	0
"Remote workplace"	0	1	0
"Surgical workplace"	0	1	0
"Veterinary workplace"	0	1	0
Some	general workplace categories without bein	g mentioned together with workplace in a	phrase.
Non-governmental or NGO or "civil society	4	2	3
Government	17	10	36
Corporate	18	7	28
Business	29	24	47
Company	7	4	26
"Universit"*	499 (hits)	232 (hits)	192 (hits)
"Higher education"	269 (hits)	50	35
College	241 (hits)	27	9

Table A3 shows that workplace is mostly used without specification, and if used with an affiliation, academic is the main term used. For general workplace categories, higher education was by far the most present. For strategy 3, we did not analyze which workplaces were present in the abstracts as the abstracts containing EDI phrases and frameworks are already covered under strategies 1, 2, and 4.

**Table A4.** Frequency of actors (associations, societies, and journal names) (list of terms found by reading all the abstracts from strategies 1 and 2).

Name of Associations, Societies, and Journal Names	Frequency in the 1150 Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in 531 Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
Academic Pediatric Association	1	0	0
American Accounting Association	1	0	0
American Association for Anatomy	2	1	0
American Association for Geriatric Psychiatry Board	1	0	0
American Association for the Surgery of Trauma (AAST)	1	0	0
American Association for the Surgery of Trauma Diversity, Equity, and Inclusion Committee	1	0	0
American Association of Colleges of Nursing	1	0	0
American Association of Directors of Psychiatric Residency Training	1	0	0
American Association of Family and Consumer Sciences (AAFCS)	1	0	0
American Association of Medical Colleges (AAMC)	1	0	0
American Association of Physicists in Medicine.	1	0	0
American Astronomical Society (AAS)	1	0	0
American Chemical Society	3	0	0
American College of Cardiology/American Heart Association (ACC/AHA)	1	0	0
American Counseling Association	1	0	0
American Dental Education Association	1	0	0
American Kinesiology Association	1	1	0
American Library Association	2	0	0
American Medical Directors Association	1	0	0
American Montessori Society (AMS)	1	0	0
American Nephrology Nurses Association (ANNA)	1	0	0
American Ornithological Society	1	0	0
American Pediatric Surgical Association	1	0	0
American Physical Therapy Association (APTA)	1	0	0
American Physiological Society (APS)	1	0	0
American Psychiatric Association	1	0	0
American Psychological Association (APA)	5	1	1
American Society for Cell Biology	1	0	0
American Society for Clinical Investigation	1	0	0

Table A4. Cont.

Name of Associations, Societies, and Journal Names	Frequency in the 1150 Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in 531 Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
American Society for Engineering Education	42 but all about as publisher	27 but 26 are a copyright notice based on a proceeding.	0
American Society for Radiation Oncology (ASTRO)	1	0	0
American Society of Business and Behavioral Sciences	1	0	0
American Society of Civil Engineers	1	1	0
American Society of Health-System Pharmacists (ASHP)	1	2	0
American Society of Plant Biologists (ASPB)	1	0	0
American Society of Radiation Oncology (ASTRO)	1	0	0
American Society of Safety Professionals (ASSP)	2	2	0
American Speech-Language-Hearing Association	1	0	0
American Surgical Association	1	0	0
American Urological Association	1	1	0
American Veterinary Medical Association (AVMA)	2	0	0
Antennas and Propagation Society (AP-S)	1	0	0
Association for Computing Machinery	2	1	0
Association for Educators in Journalism	1	0	0
Association for Infant Mental Health (AIMH)	1	0	0
Association for Library Collections and Technical Services	1	0	0
Association for multidisciplinary education and research in substance use and addiction	1	0	0
Association of Schools Advancing Health Professions (ASAHP)	1	0	0
Association for the Study of Medical Education	1	0	0
Association for University Regional Campuses of Ohio	1	0	0
Association of Academic Health Sciences Libraries	1	0	0
Association of American Medical Colleges	3	2	0
Association of American Veterinary Medical Colleges	2	0	0
Association of College and Research Libraries Health Sciences	1	0	0
Association of College and Research Libraries	2	0	0

Table A4. Cont.

Name of Associations, Societies, and Journal Names	Frequency in the 1150 Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in 531 Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
Association of Collegiate Schools of Planning (ACSP)	1	0	0
Association of Program Directors in Surgery	1	1	0
Association of Research Libraries (ARL)	1	0	0
Association of Schools Advancing Health Professions (ASAHP)	3	0	0
Association of Schools of Public Health in the European Region (ASPHER)	1	0	0
Association of Southeastern Biologists	1	0	0
Association of Universities for Research in Astronomy (AURA)	1	0	0
Association of Women Surgeons	1	0	0
Audio Engineering Society	1	0	0
Australian Association of Social Workers.	1	0	0
Biochemical Society	1	0	0
British Association for American Studies	1	0	0
British Association of Oral and Maxillofacial Surgeons (BAOMS)	1	0	0
British Society for Geomorphology	1	0	0
Canadian agricultural economics society (CAES)	1	0	0
Canadian Art Therapy Association Journal	1	0	0
Canadian Association of Psychosocial Oncology	2	0	0
Canadian Association of Radiologists Journal	1	2	0
Canadian Association of Thoracic Surgeons (CATS)	1	0	0
Canadian Association on Gerontology (CAG)	1	0	0
Canadian Cardiovascular Society (CCS)	1	0	0
Canadian Medical Association	2	0	0
Canadian Psychological Association	1	0	0
Canadian Society of Immunology	1	0	0
Ecological Society of America	1	0	0
Electrochemical Society	1	0	0
European Commission's Science with and for Society	1	0	0
European Journal for Sport and Society	1	0	0
European Society for Engineering Education (SEFI)	1	0	0
European Society of Cardiology (ESC)	1	0	0

Table A4. Cont.

Name of Associations, Societies, and Journal Names	Frequency in the 1150 Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in 531 Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
Geological Society of London	1	0	0
Georgia Library Association (GLA)	1	0	0
Human Factors and Ergonomics Society (HFES)	1	0	0
IEEE Computer Society	1	0	0
Implicit Association Tests (IATs)	1	0	0
International Association for Dental Research (IADR)	2	0	0
International Association for Research on Service—Learning and Community Engagement	1	0	0
International Lactation Consultant Association (ILCA)	1	0	0
International Nursing Association for Clinical Simulation and Learning	1	0	0
Journal of the American Association of Nurse Practitioners	1	0	0
Journal of the American Heart Association	1	0	0
Journal of the American Medical Association	2	1	0
Journal of the American Medical Directors Association	1	0	0
Journal of the American Planning Association	2	0	0
Journal of the American Veterinary Medical Association	4	4	0
Journal of the Association for Information Science and Technology	1	0	0
Journal of the Canadian Health Libraries Association (JCHLA)	1	1	0
Journal of the Medical Library Association	1	0	0
Latin American Science, Technology and Society	1	0	0
Learning analytics dashboards (LADs)	1	0	0
Marine Technology Society	2	0	0
Medical Library Association	3	0	0
Midwest Nursing Research Society	1	0	0
Montreal, QC, Canada, Association for Computing Machinery	1	0	0
Multicultural Veterinary Medical Association (VMA)	1	0	0
National Association of Diversity Officers in Higher Education	1	3 (all as copyright notice)	0
National Association of EMS Physicians (NAEMSP)	1	1	0

Table A4. Cont.

Name of Associations, Societies, and Journal Names	Frequency in the 1150 Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in 531 Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
National Association of Geoscience Teachers.	1	0	0
National Association of School Psychologists	3	0	0
National Association of Teachers of Singing (NATS)	1	0	0
National Athletic Trainers' Association (NATA)	1	0	0
National Collegiate Athletic Association (NCAA)	1	0	0
National Communication Association Heritage Project	1	0	0
National Society Leadership and Podium Speakers in Cardiothoracic Surgery	1	0	0
National Society of Genetic Counselors (NSGC)	2	0	0
New York State Society of Certified Public Accountants	1	0	0
North Atlantic Regional Association for Counselor Education and Supervision (NARACES)	1	0	0
Oncology Nursing Society	3	1	0
Physician Assistant Education Association	2	0	0
Reference and User Services Association (RUSA)	3	0	0
Risk Management Association	1	0	0
Royal Astronomical Society (RAS)	1	0	0
Society for Academic Emergency Medicine	1	0	0
Society for Conservation Biology-Marine Section	2	0	0
Society for Epidemiologic Research	1	0	0
Society for Health and Physical Educators (SHAPE) America	1	0	0
Society for Research on Nicotine and Tobacco	2	0	0
Society for Vascular Surgery	2	1	0
Society of American Archivists	1	0	0
Society of Behavioral Medicine (SBM)	1	0	0
Society of Clinical Child and Adolescent Psychology	1	0	0
Society of General Internal Medicine	1	0	0
Society of Hospital Medicine	2	0	0
Society of Systematic Biologists	1	0	0
Society of Trauma Nurses (STN)	1	0	0

Table A4. Cont.

Name of Associations, Societies, and Journal Names	Frequency in the 1150 Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in 531 Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
Soil Science Society of America Journal	1	0	0
The American Association for Anatomy (AAA)	1	1	0
The American Association for the Advancement of Science (AAAS)	2	0	0
The American Association of Physicists in Medicine (AAPM)	1	0	0
The American Bar Association	1	0	0
The American Choral Directors Association	1	0	0
The American Kinesiology Association	1	0	0
The American Occupational Therapy Association (AOTA)	1	0	0
The American Ornithological Society.	1	0	0
the American Psychological Association	1	0	0
the American Society for Matrix Biology (ASMB)	1	0	0
the American Society for Nutrition	1	0	0
The American Society for Reproductive Medicine	1	0	0
The American Surgical Association	1	0	0
The American Urogynecologic Society	1	0	0
The Association for Specialists in Group Work (ASGW)	1	0	0
The Association of American Medical Colleges	3	2	0
The Association of Family Medicine Residency Directors (AFMRD)	1	0	0
the Association of Infant Mental Health in Tennessee	1	0	0
The Association of Pediatric Surgery Training Program Directors (APSTPD)	1	0	0
The Australian and New Zealand Association for Leisure Studies	1	0	0
The British Association of Oral and Maxillofacial Surgeons	1	0	0
The Canadian Association of Emergency Physicians (CAEP)	1	0	0
The Canadian Association on Gerontology (CAG)	1	0	0
The Design Society	1	0	0
The National Association of Clinical Nurse Specialists (NACNS)	1	0	0
The National Association of Diversity Officers in Higher Education (NADOHE)	1	0	0

Table A4. Cont.

Name of Associations, Societies, and Journal Names	Frequency in the 1150 Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in 531 Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
The Obesity Society	1	0	0
The Society for Post-Acute and Long-Term Care Medicine.	1	0	0
The Society for Surgery of the Alimentary Tract	1	0	0
The Society for the Teaching of Psychology	1	0	0
The Society of Thoracic Surgeons	1	0	0
UFFC Society administration and activities	1	0	0
UFFC Society	1	0	0
UIKTEN-Association for Information Communication Technology Education and Science	1	0	0
Ultrasonics, Ferroelectrics, and Frequency Control Society (UFFC Society)	1	0	0
University Aviation Association	1	0	0
University Film and Video Association (UFVA)	1	0	0
World Federation	0	0	0
World Association	0	0	0
United Nation	0	0	0

 $Table\ A4\ shows\ various\ associations,\ societies,\ and\ journal\ names,\ but\ most\ are\ only\ mentioned\ once.$ 

**Table A5.** Frequency of Actors (universities, colleges, disciplines or departments, and faculty or students mentioned) (list of terms found by reading all the abstracts from strategies 1 and 2).

Names of Universities and Colleges	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained Through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
"Universit*"	499 (hits)	232 (hits)	192 (hits)
"Higher education"	269 (hits)	50	35
College	241 (hits)	27	9
		Names of universities or colleges	
American College of Cardiology/American Heart Association (ACC/AHA)	1	0	0
American College of Gastroenterology (ACG)	1	0	0
American College of Healthcare Executives	1	0	0
American College of Neuropsychopharmacology (ACNP)	1	0	0
American College of Radiology	1	0	0
American College of Veterinary Emergency and Critical Care	1	0	0
Association of College and Research Libraries	1	0	0

Table A5. Cont.

Names of Universities and Colleges	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained Through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
Ball State University	1	0	0
Boston College Law School	2	0	0
Canadian College of Health Leaders	1	0	0
Carl R. Ice College of Engineering at Kansas State University	1	0	0
Clemson University	1	0	0
College of Engineering and Computing	1	0	0
College of Engineering and Science at Louisiana Tech University	2	0	0
College of Liberal Studies	1	0	0
College of Midwives of Ontario	1		0
College of Nursing	1	0	0
College of Science and Engineering	1	0	0
College teaching and student learning	1	0	0
Deakin University (Australia)	1	0	0
Department of Chemistry and Chemical Biology (CCB) at McMaster University	1	0	0
Department of Civil and Environmental Engineering at Carnegie Mellon University	1	0	0
Eindhoven University of Technology	1	0	0
Faculty at the College of the Holy Cross	1	0	0
Faculty of Natural Sciences at Imperial College London	1	0	0
Gallaudet University	1	0	0
Gannon University	1	0	0
Georgia Tech's College of Engineering	1	0	0
Grand Valley State University	2	0	0
Hong Kong university	1	1	0
Imperial College	2	2	0
Imperial College London; Faculty of Natural Sciences	1	0	0
Imperial College; Chemistry Department	2	0	0
Iowa State University	1	1	0
Johns Hopkins University	1	0	0
Land Grant University	1	2	1
Land Grant University; STEM Faculty	1	0	0
Las Vegas University	1	1	0
Louisiana Tech University; Advancing faculty program	1	0	0
Louisiana Tech University; Faculty Program in the College of Engineering and Science	1	0	0
Macquarie University	1	0	0
Music Departments of King's College London	1	0	0
Nanyang Technological University in Singapore	1	0	0
National Community College Hispanic Council	1	0	0
New Mexico State University	1	1	0
New Mexico State University; Women engineering faculty	1	0	0
New York City College of Technology	1	1	0

Table A5. Cont.

Names of Universities and Colleges	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained Through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
North Carolina Community College	1	0	0
North Dakota State University (NDSU	1	0	0
Oakland University	1	0	0
Oxford University	3	0	0
Physics at Rhodes College	1	0	0
Portland State University (USA)	1	0	0
Psychology at Hiram College		0	0
Purdue University	1	0	9
Regional Australian University	1	0	0
RMIT University	1	0	0
Royal College of General Practitioners	1	0	0
Royal College of Nursing (Great Britain)	1	0	0
Rutgers University	2	0	0
Rutgers University for Faculty Advancement and Institutional Re-imagination	2	0	0
Rutgers, The State University of New Jersey; Women Faculty, American Chemical Society	1	0	0
San Antonio College	1	0	0
School of Medicine, Dentistry and Biomedical Sciences at Queen's University	1	0	0
Seattle University	1	1	0
Southwestern Ontario University	1	0	0
Syracuse University	1	0	1
The Canadian College of Health Leaders	2	0	0
The College of Arts and Sciences	1	0	0
The College of Engineering	2	1	0
The George R. Brown School of Engineering at Rice University	1	0	0
The Medical College of Wisconsin	1	0	0
The Royal Australasian College of Surgeons (RACS)	1	0	0
The Royal College of Surgeons of England and British Association of Oral and Maxillofacial Surgeons	1	0	0
The State University of New Jersey	1	0	0
The University of Alberta; Chemistry Department	1	0	0
The University of California San Francisco Neurology Department	1	0	0
The University of Delaware	1	0	0
The University of Minnesota; Women in Medicine and Science (CWIMS)	1	0	0
The University of Nevada,	1	0	0
The University of Puerto Rico; Science faculty	1	0	0
The University of Rhode Island; Men STEM faculty	1	0	0
The University of San Diego; Advancement of Female faculty	1	0	0
The University of Wisconsin Women in Science and Engineering Leadership Institute (WISELI)	1	0	0
Trinity College Dublin	1	0	0

Table A5. Cont.

Names of Universities and Colleges	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained Through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
The University of Delaware; Women STEM faculty	1	0	0
Tuskegee University	1	0	0
Tuskegee University faculty of vet med	1	0	0
U.S. Army War College	1	0	0
University Aviation Association	1	0	0
University College, London, England	2	0	0
University Film and Video Association (UFVA)	1	0	0
University Fort Wayne	1	0	0
University of Akron	1	0	1
University of Alabama (USA)	1	0	1
University of Baltimore School of Law in Maryland	1	0	0
University of Calgary	1	0	0
University of California		4	0
University of California Academic Senate	1	0	0
University of California Berkeley	1	2	0
University of California Berkeley Food Institute	1	0	0
University of California, San Francisco	1	0	0
University of Cambridge	1	0	0
University of Cape Town	1	0	1
University of Chicago	1	1	0
University of Colorado at Boulder, Colorado	2	0	0
University of Exeter (UK)	1	0	0
University of Florida	1	0	0
University of Florida's Health Science Center Libraries	1	0	0
University of Illinois	2	0	0
University of Kent	2	1	0
University of Michigan	1	3	0
University of New Brunswick	1	0	0
University of North Carolina Charlotte	1	0	0
University of North Florida	1	1	0
University of Pittsburgh	1	1	0
University of Puerto Rico	1	0	0
University of Rhode Island	1	0	0
University of Rhode Island; AAUP faculty	1	0	0
University of San Diego (USD)	1	0	0
University of Sharjah, United Arab Emirates	1	0	1
University of South Carolina	1	0	0
University of South Carolina Upstate; Faculty of Theatrical Intimacy Education (TIE)	1	0	0
University of Southern California	1	1	0
University of Texas	2	0	0

Table A5. Cont.

Names of Universities and Colleges	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained Through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
University of Toledo	2	0	1
University of Toronto	1	0	1
University of Utah	1	2	0
University of Virginia	1	2	0
University of Washington	1	2	0
University of West Georgia	1	1	0
University of Wisconsin	1	0	0
University-Purdue	1	0	0
West Virginia University	1	0	0
Western Reserve University	1	0	1
Wiess School of Natural Sciences at Rice University in Houston	1	0	0
Winston-Salem State University	0	0	0
	-	Departments or disciplines	·
"All members"	6	2	1
Anthropology	1	0	1
Architecture	0	1	0
Arts, academic	5	3	0
Arts, community (not academic as comparison)	14	3	5
Biogeosciences	1	0	0
Biological Engineering	1	0	0
Business School	5	2	9
Cell Biology	3	0	0
Chemistry	20	5	1
Computer Science	16	6	0
Counselor Education	1	0	0
Disability Studies	0	0	1
Economics	5	3	3
Engineering	492 (hits)	212 (hits)	16
	1	0	0
Engineering Librarians  Environmental Engineer	2	0	0
Humanities	4	2	1
Kinesiology	2	4	0
Philosophy	0	0	0
Political Science*	0	0	1
Physics	12	2	1
Psychology	26	16	11
Psychiatry	20	0	0
Research	1079 (hits)	645 (hits)	1258 (hits)
School of Law	1	0	0
Science Science	463 (hits)	258 (hits)	34
Social Science*	10	5 5	5
Sociology Sociology	3	2	7
STEM	257 (hits)	22	19
	6	1	0
University Libraries	U	1	<u> </u>

Table A5. Cont.

Names of Universities and Colleges	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained Through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
		Faculty or students mentioned	
Faculty	653 (hits)	255 (hits)	163 (hits)
"Student*"	990 (hits)	595 (hits)	161 (hits)
Undergraduate	109 (hits)	25	5
Staff	83	38	16

Table A5 shows that very few disciplines as evident in departments were present, with Engineering and STEM being the main ones and social-science-related ones rarely mentioned.

**Table A6.** Frequency of Actors (medical-disciplines- and health-profession-related terms) (list of terms found by reading all the abstracts from strategies 1 and 2).

Names of Universities and Colleges	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts And not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
		Medicine	
"Allied health profession*"	0	0	1
American Society of Health-System Pharmacists	4	2	0
Anatomy	3	2	0
Cardiology	4	0	0
Clinician or "Clinical Care"	16	7	0
COVID	142 (hits)	48	18
Dental	8	5	0
"Emergency medicine"	6	8	0
"Family medicine"	4	1	0
"Genetic Counselors"	2	0	0
"Health Care" or "healthcare"	143 (hits)	106 (hits)	17
Healthcare professional or health care professional or healthcare professionals or health care professionals or health profession	6	5	4
"Hospital Medicine"	3	0	3
"Medical education"	33	19	1
"Medical Library Association"	4	0	0
"Medical profession*"	3	0	5
Midwifery	2	0	1
"Molecular Imaging"	1	0	1
"Neuro*"	18	9	3

Table A6. Cont.

Names of Universities and Colleges	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts And not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained through Strategy 4 Were Not Analyzed for New Actors. We Only Looked for Actors Already Identified through Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
Nursing or nurses	191 (hits)	186 (hits)	6
"Obstetrics and Gynecology"	5	2	0
"Occupational Therapy"	3	0	2
Oncology	17	11	0
"Oncology Nursing Society"	4	1	0
Otolaryngology	4	3	0
Pathology	6	0	1
Pediatrics	6	1	0
Pharmacy	6	4	0
"Physical therap*" or "physiotherapy*"	4	0	0
Physician	33	21	2
"Physician Assistant"	3	0	0
Psychiatry or Psychology	36	19	29
Radiology	9	7	0
Rehabilitation	3	3	7
Residency	28	19	0
"Social Work*"	8	2	0
"Speech language pathology*" or "speech therap*" or "audiolog*"	2	1	0
Surgical OR Surgery	40	29	1
Therapy or therapists	16	3	2
Urology	2	5	0
Vet Med—AVMA	1	0	0
Veterinary	11	5	0

 $Table\ A6\ shows\ some\ hits\ with\ various\ medical\ specialties\ and\ few\ ones\ for\ most\ health\ professions.$ 

**Table A7.** Phrases containing the term "social", with phrases found by reading all the abstracts from strategies 1 and 2.

Phrases Mentioning Social	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained through Strategy 4 Were Not Analyzed for New Social Terms but Only for the Presence of Social Terms Found with Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
Social	538 (hits)	285 (hits)	830 (hits)
"Social justice"	38	20	15
"Social media"	15	14	39

Table A7. Cont.

Phrases Mentioning Social	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained through Strategy 4 Were Not Analyzed for New Social Terms but Only for the Presence of Social Terms Found with Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
"Social determinant*"	11	5	1
"Social science*"	8	5	4
"Social work*"	7	3	2
"Social identit*"	7	2	17
"Social injustice*"	7	2	0
"Social implication*'	6	2	129 (high because journal asks for phrase in abstract often)
"Social value*"	4	0	3
"Social responsibili*"	4	1	3
"Social networking"	3	0	0
"Social issue*"	3	3	5
"Social unrest"	3	1	0
"Social support*"	3	1	9
"Social procurement*"	2	1	1
"Social change*"	2	0	11
"Social categori*"	2	0	6
"Social welfare"	2	0	2
"Social cohesion"	2	0	2
"Social class"	2	1	4
"Social inclusion"	2	0	3
"Social learning"	2	0	0
"Social environment"	2	0	1
"Social contract"	2	0	0
"Social structure"	2	2	2
"Social-emotional learning"	2	0	0
"Social need"	2	1	0
"Social marketing"	1	0	0
"Social enterprise*"	1	0	1
"Social skill*"	1	0	1
"Social group"	1	0	2
"Social movement"	1	1	6
"Social consciousness"	1	0	0
"Social disparities"	1	0	0
"Social norm"	1	0	4
"Social power"	1	0	0
"Social participation"	1	2	0
"Social isolation"	1	2	1
"Social service"	1	2	0
"Social relevance"	1	1	0

Table A7. Cont.

Phrases Mentioning Social	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts). The Abstracts Obtained through Strategy 4 Were Not Analyzed for New Social Terms but Only for the Presence of Social Terms Found with Strategies 1 and 2	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts) of Terms in Abstracts Found with Strategies 1 and 2
"Social diversity"	1	0	1
"Social technologies"	1	0	0
"Social disclosure"	1	0	0
"Social dynamics"	1	0	1
"Social climate"	1	0	0
"Social agenda"	1	0	1
"Social construction"	1	0	4
"Social behavior"	1	0	0
"Social transformation"	1	0	2
"Social health"	0	0	0

Table A7 shows very few phrases containing "social" are present, and even less are present more than one time.

**Table A8.** Hit counts for other social indicators in the abstracts, with terms obtained from the existing literature [191–227].

Terms	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
	Well-being		
"Well being" OR "well-being" or "wellbeing"	35	27	22
"Psychological wellbeing" or "Psychological well-being" or "Psychological well being"	2	2	3
"social wellbeing" or "social well-being" or "social well being"	0	0	0
"Economic wellbeing" or "Economic well-being" or "Economic well being"	0	0	1
"Emotional wellbeing" or "Emotional well-being" or "Emotional well being"	0	1	1
"environmental wellbeing" or "environmental well-being" or "environmental well being"	0	0	0
"Societal wellbeing" or "Societal well-being" or "Societal well being"	0	0	0
"Subjective wellbeing" or "Subjective well-being" or "Subjective well being"	0	0	0
"Work/life wellbeing" or "Work/life well-being" or "Work/life well being"	0	0	0

Table A8. Cont.

Terms	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
	Individual terms from the existing	literature [191–227]	
Autonomy	1	0	5
Bias*	224 (hits)	118 (hits)	53
COVID	122 (hits)	48	18
"Data protection"	1	0	0
Dignity	5	0	3
Ethic*	22	9	21
"Good life"	0	0	0
"Health Equity"	26	19	0
"Hierarch*"	8	8	31
"Identit*"	200 (hits)	42	380 (hits)
Independence	4	2	3
Interdependence	0	0	0
Interdependent	2	0	3
"Intersectional*"	47	17	188 (hits)
Justice	250 (hits)	184 (hits)	31
Privacy	4	4	5
"Quantum ethics"	0	0	0
"Reasonable accommodation"	0	0	0
Respected	5	3	0
Respecting	5	1	4
"Self-determination"	0	0	3
Social	538 (hits)	285 (hits)	830 (hits)
"Social good"	1	1	0
"Social impact*"	4	1	0
"Social implication*"	6	2	126
"Social responsibility"	7	0	3
Societal	27	18	37
"Societal impact*"	0	0	0
"Societal implication*"	0	0	1
Solidarity	8	1	10
"Stereotype*"	14	4	28
"Stigma*"	11	3	12
"Technological deskilling" or deskilling	0	0	0
"Work–life" OR "work/life"	15	1	25
	International documents list ta	ken from [228]	
"Convention on the Elimination of All Forms of Discrimination against Women"	0	0	0
"Convention on the rights of Persons with Disabilities"	1	0	1

Table A8. Cont.

Terms	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
"Convention on the rights of the child"	0	0	0
"Declaration on the Rights of Indigenous Peoples"	0	0	0
"International Convention on the Elimination of All Forms of Racial Discrimination"	0	0	0
"Transforming our world: the 2030 agenda for sustainable development"	0	0	0
"UN flagship report on disability and development"	0	0	0
"UN Framework Convention on Climate Change"	0	0	0
"Universal Declaration of Human Rights"	0	0	0

Table A8 shows that although the term "social" generated some hits, phrases containing the term "social" generated much fewer to no hits. Wellbeing was mentioned rarely, and UN international documents covering social groups and the topic of climate chang were not mentioned.

**Table A9.** Hit counts for the terms of various composite measures of the "social" [445–469] in abstracts mentioning the documents.

Terms	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
AQOL	0	0	0
"Better life index"	0	0	0
"Brief Inventory of Thriving"	0	0	0
"Calvert-Henderson Quality of Life"	0	0	0
"Canadian Index of well being"	0	0	0
"Community based rehabilitation"	0	0	0
"Community based rehabilitation matrix"	0	0	0
"Community rehabilitation"	0	0	0
"Comprehensive Inventory of Thriving"	0	0	0
"Determinants of health"	12	7	1
"Flourishing Scale"	0	0	0
"Index of well-being"	0	0	0
"Perceived Life Satisfaction"	0	0	0
Satisfaction with life scale	0	0	0
"Scale of Positive and Negative Experience"	0	0	0
"Social determinants of health"	12	4	1
"The Disability and Wellbeing Monitoring Framework and Indicators"	0	0	0
"The Quality of Being Scale"	0	0	0
"Well-being index"	0	0	0
"Meaning in Life"	0	0	0
"Capability approach"	1	0	0

Table A9 shows that terms used for the various composite measures of the "social" were not mentioned except for "determinants of health", "social determinants of health" and "capability approach".

 Table A10. Presence of Community Based Rehabilitation Matrix indicators in the abstracts.

Primary Indicator	Secondary Indicator	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts Fand Not Actual Abstracts)
Health		603 (hits)	515 (hits)	147 (hits)
	"healthcare" OR "health care"	143 (hits)	106 (hits)	17
	"assistive technology" OR "assistive technologies" OR "assistive device" OR "assistive devices"	0	1	3
	"Health promotion"	2	1	0
	"Health prevention"	0	0	0
	Rehabilitation	2	3	0
Education		1042(hits)	608 (hits)	228 (hits)
	"Childhood education"	0	0	0
	"Primary education"	0	0	0
	"Secondary education"	3	1	1
	"Non-formal"	0	0	0
	"Life-long learning"	0	0	0
Livelihood		0	0	0
	"Skills development"	1	0	1
	"Self-Employment"	0	0	3
	"Financial services"	0	0	4
	"Wage employment"	0	0	0
	"Social protection"	0	0	1
Social		538 (hits)	285 (hits)	830 (hits)
	"social relationship"	0	0	1
	Family	20	7	49
	"Personal Assistance"	0	0	0
	Culture	196 (hits)	47	168 (hits)
	Arts	20	5	7
	Recreation OR leisure OR sport	23	20	8
"Empower*"		26	6	23
	"Communication*"	137 (hits)	41	27
	"Social mobilization"	0	0	0
	"Political participation"	0	0	0
	"Self-help groups"	0	0	1
	"Disabled people's organization"	0	0	0

Table A10 shows a very uneven coverage of the individual indicators.

 $\textbf{Table A11.} \ Presence \ of \ Canadian \ Index \ of \ Wellbeing \ indicators \ in \ abstracts.$ 

Terms	Secondary Indicator	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
"Social Relationship*"		0	0	0
	"Social engagement"	0	0	1
	"Social Support"	3	1	9
	"Community safety"	0	0	0
"Social norm"		1	0	0
"Democratic engagement"		0	0	0
	Participation	58	36	47
	"Communication*"	137 (hits)	41	27
	Leadership	377 (hits)	174 (hits)	175 (hits)
Education		1042 (hits)	608 (hits)	228 (hits)
	"Competenc*"	11	28	21
	Knowledge	117 (hits)	46	149 (hits)
	"Skill*"	129 (hits)	32	133 (hits)
Environment		140 (hits)	47	50
	Air	1	0	1
	Energy	5	1	1
	Freshwater	0	0	0
	"Nonrenewable material"	0	0	0
	"Biotic resources"	0	0	0
"Healthy population"		0	0	0
	"personal wellbeing"	0	0	0
	"Physical health"	1	1	0
	"Life expectancy"	1	1	2
	"Mental health"	22	15	10
	"functional health"	0	0	0
	Lifestyle	1	2	0
	"Public health"	11	8	4
	Healthcare or "health care"	143 (hits)	106 (hits)	17
Culture		196 (hits)	47	168 (hits)
Leisure		3	1	3
"Living standard"		0	0	0
	Income	14	10	12
	"Economic security"	1	0	0
Time		ND	ND	ND

Table A11 shows a very uneven coverage of the individual indicators.

**Table A12.** Presence of Better Life Index indicators in abstracts.

Indicator	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
"Civic engagement"	2	1	1
Community	369 (hits)	217 (hits)	61
Education	1042 (hits)	608 (hits)	228 (hits)
Environment	140 (hits)	47	50
Health	603 (hits)	515 (hits)	147 (hits)
Income	14	10	12
Job	12	13	96
Housing	4	1	5
"Life satisfaction"	2	0	1
"Physical environment"	0	0	0
Safety	11	12	8
"Work-life balance" or "work/life balance"	7	0	10
"Work–life" or "work/life"	15	3	22

Table A12 shows a very uneven coverage of the individual indicators.

**Table A13.** Presence of social determinants of health (SDH) indicators in abstracts.

Indicator	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
"Aboriginal" OR "first nations" OR "Metis" OR "Indigenous peoples" OR "Inuit" OR "native American*"	5	9	5
Advocacy	39	15	7
Coping	20	0	8
"Disabled women" OR "Women with disabilities"	0	0	4
"Discrimination*"	103 (hits)	34	422 (hits)
"Early Childhood Development"	0	0	0
Education	1042 (hits)	608 (hits)	228 (hits)
Employment	37	3	408 (hits)
"Ethnic*"	227 (hits)	161 (hits)	266 (hits)
"Food Insecurity" or "food security"	1	0	0
Gender	625 (hits)	236 (hits)	1428 (hits)

Table A13. Cont.

Indicator	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
Genetic	12	3	2
Globalization	1	1	5
"Health Services"	1	6	3
Housing	4	1	5
Immigration	6	1	8
Income	14	10	12
"Job Security"	1	0	4
Literacy	12	10	0
"Physical environment"	0	0	0
"Race" or "racialized"	184 (hits)	55	161 (hits)
"Social engagement"	0	0	1
"Social Exclusion"	6	0	2
"Social integration"	0	0	3
"Social Safety Network"	0	0	0
"Social status"	0	0	2
Stress	12	7	12
Transportation	2	1	2
Unemployment	3	0	12
"Vocational training"	0	1	0
Walkability	0	0	0
	T 11 440 1	6.1 1 11 11 11 1	

Table A13 shows a very uneven coverage of the individual indicators.

Table A14. Hit counts of abstracts mentioning social terms identified from the CRPD [228].

Terms	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
Abandonment	0	0	0
Ability	37	23	23
Abuse	4	1	5
"Academic development"	0	0	1
"Access to information"	2	1	1
"Accessible information"	0	1	0
Adoption	20	9	10
"Affirmative action"	3	3	14
"Alternative communication"	0	0	0

Table A14. Cont.

Terms	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
"Armed conflict"	0	0	0
Art	6	3	1
"Augmentative communication"	0	0	0
Awareness	102 (hits)	40	44
"Awareness raising"	0	0	1
"Best practice"	24	21	12
Braille	0	0	0
"Capacity building"	1	1	0
"Child rearing"	0	0	1
Clothing	0	0	2
Concealment	0	0	2
Creativity	5	3	1
"Cultural identity"	1	1	6
"Cultural life"	0	0	0
"Economic assistance"	0	0	0
Entrepreneurship	9	3	13
Exploitation	3	1	7
Food	19	1	2
"Freedom of expression"	1	1	0
"Fundamental freedom"	0	0	0
Guardianship	0	0	0
Habilitation	3	0	0
Harassment	17	4	26
Harmful	4	4	4
"Health insurance"	1	0	0
"Human rights"	10	1	13
"Humanitarian emergencies"	0	0	0
"Intellectual property"	1	0	0
"International collaboration"	0	0	0
Isolation	9	3	2
Knowledge	117 (hits)	46	149 (hits)
"Lack of knowledge"	1	0	0
"Life insurance"	0	0	2
"Linguistic identity"	0	0	0
"Living condition"	0	0	0
Marriage	2	0	3

Table A14. Cont.

Terms	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
"Media portrayal"	0	0	0
"Mentor*"	237 (hits)	30	16
"Mobilit*"	11	3	8
"Natural disaster"	0	0	0
Neglect	9	1	2
"Peer support"	2	1	0
"Personal mobility"	0	0	0
Personhood	0	0	0
"Political life"	0	0	0
"Political parties"	0	0	0
"Political rights"	0	0	0
Portrayal	3	0	0
Poverty	7	1	5
Prejudice	10	4	12
Public life	1	0	2
"Reasonable accommodation"	0	0	0
Receptiveness (to rights)	0	0	0
"Research and development"	5	2	1
"Respite care"	0	0	0
Segregation	6	1	10
"Self-respect"	0	0	0
"Self-worth"	0	1	0
"Sign language"	0	0	0
"Social development"	5	0	1
"Social environment"	2	0	1
"Standard of living"	0	0	1
Talent	27	8	13
"Technical assistance"	0	0	0
Training	284 (hits)	195 (hits)	48
"Universal design"	2	1	2
Violence	10	6	12
Voting	0	0	0
Water	8	0	1
Welfare	5	3	11

Table A14 shows very few hits with social terms identified from the CRPD.

**Table A15.** Hit counts of abstracts mentioning technologies, science, and technology governance concepts and ethics fields.

Terms	Frequency in Downloaded Abstracts Obtained with Strategies 1 and 2 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in Downloaded Abstracts Obtained with Strategy 4 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)	Frequency in the 781 Downloaded Abstracts Obtained with Strategy 3 (If It Says Hits, This Means Hit Counts and Not Actual Abstracts)
	Some technolog	ies	
Engineering	492 (hits)	212 (hits)	16
"Artificial intelligence" or "machine learning"	6	20	14
"Neuroscience*"	3	2	0
"Communication technolog*"	1	0	1
"Information technolog*"	1	3	5
Quantum	1	0	0
"robotics" or "robot" OR "robots"	1	1	0
"Assistive technolog*"	0	1	2
"Technolog*"	182 (hits)	115 (hits)	35
"Virtual reality"	0	2	0
	Science a	nd technology governance co	ncepts
"Technology governance"	1	0	0
"Science and technology governance"	1	0	0
"Anticipatory governance"	0	0	0
"Democratizing science and technology"	0	0	0
"Parliamentary technology assessment"	0	0	0
"Participatory technology assessment"	0	0	0
"Responsible innovation"	0	0	0
"Responsible research and innovation"	0	0	0
"Technology assessment"	0	0	0
"Transformative vision assessment"	0	0	0
"Upstream engagement"	0	0	0
		Ethics fields	
"AI-ethics"	0	1	0
"Bioethics"	0	2	0
Computer science ethics"	0	0	0
"Information technology ethics"	0	0	0
"Nanoethics"	0	0	0
"Neuroethics"	0	0	0
"Robo-ethics"	0	0	0

 $Table\ A15\ shows\ few\ mentions\ of\ technologies,\ ethics\ fields,\ and\ science\ and\ technology\ governance\ terms.$ 

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