ZIN

Studia Informacyjne
Information Studies

VOL. 63 2025 NO. 1A(125A)
p-ISSN 0324-8194
e-ISSN 2392-2648

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Czasopismo dofinansowane przez Wydział Dziennikarstwa, Informacji i Bibliologii Uniwersytetu Warszawskiego z programu ID UB UW.

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Zawartość czasopisma jest indeksowana w CEJSH, CEEOL, CSA, LISTA, Knowledge Organization Literature, PBN, PBB.

The paper version is the original version of the journal.
The content of the journal is indexed in CEJSH, CEEOL, CSA, LISTA, Knowledge Organization Literature, PBN, PBB.

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ZAGADNIENIA INFORMACJI NAUKOWEJ

Studia Informacyjne

ISSUES IN INFORMATION SCIENCE

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Warszawa 2025

ISSUES IN INFORMATION SCIENCE – INFORMATION STUDIES

The core purpose of *Issues in Information Science – Information Studies (Zagadnienia Informacji Naukowej – Studia Informacyjne,* ZIN – *Studia Informacyjne)* is to provide a forum for the dissemination of scientific papers and research results in the field of information science and other disciplines which analyze social and technological aspects of various information-related activities performed by contemporary communities. Moreover, the journal is to disseminate critical reviews and summaries of new publications in the field of information science and reports from important conferences discussing contemporary information problems.

We publish papers in Polish or English. For each paper a set of metadata is provided: an abstract and keywords in both languages) as well as author's bio and contact information.

The subtitle of the journal – *Information Studies* – emphasizes the interdisciplinary nature of its subject profile covering a broad spectrum of issues studied by various academic disciplines and professional activity domains related to access to resources of recorded information and knowledge and the use of these resources by contemporary man and society. Other subjects to be covered by ZIN – *Information Studies* involve: (1) theoretical ponderings on the practice of information-related activities performed by various communities, (2) the results of research on the conditions influencing those activities and ways of improving methods and tools employed for the activities in question, (3) the methodology of information science research, information science history and education concerning the information science. The subject profile of ZIN – *Information Studies* covers, among else, the issues of:

- information services in institutions of science, culture, business, education and administration,
- information and knowledge management,
- traditional and online scholarly communication,
- information and knowledge organization,
- metadata theory and practice,
- Web 2.0,
- Semantic Web,
- information architecture,
- information websites usability,
- digital humanities,
- human-computer interaction,
- natural language processing,
- information retrieval,
- use of information and behavior of the information users,
- social response to modern information technologies,
- culture of information,
- information, digital and media skills,
- information policy,
- information ethics.

ZIN – *Information Studies* is addressed to: (1) information science teachers and lecturers, researchers and students, (2) practitioners of information-related activities who analyze methods and tools used to implement those activities in various domains and organizational environments, (3) politicians and donators related to information activities in various domains. The journal content may also be of some interest to teachers, students and researchers in other disciplines of science which deal with various aspects of information existence and use in the contemporary world.

ZIN – *Information Studies* is included in the list of journals scored by Polish Ministry of Science and Higher Education and indexed by: Central European Journal of Social Sciences and Humanities (CEJSH), Central and Eastern European Online Library (CEEOL), Library and Information Science and Technology Abstracts (LISTA), Polish Bibliography of Book Studies (PBB), WorldCat and Polish Scholarly Bibliography (PBN). The journal is registered in the European Reference Index for the Humanities (ERIH Plus).

ZAGADNIENIA INFORMACJI NAUKOWEJ – STUDIA INFORMACYJNE

Głównym celem *Zagadnień Informacji Naukowej – Studiów Informacyjnych* (ZIN – *Studia Informacyjne*) jest zapewnienie forum dla rozpowszechniania artykułów naukowych i wyników badań z zakresu nauki o informacji (informatologii) oraz innych dyscyplin, w których podejmowane są analizy społecznych i technologicznych aspektów działalności informacyjnej prowadzonej w różnych sferach współczesnego życia społecznego. Czasopismo służyć ma również rozpowszechnianiu krytycznych recenzji i omówień publikacji z tego zakresu oraz problemowych sprawozdań z ważnych konferencji poświęconych współczesnym problemom informacyjnym.

Czasopismo adresowane jest zarówno do czytelnika polskiego, jak i zagranicznego, publikujemy artykuły zarówno w języku polskim, jak i angielskim. Każdy artykuł posiada zestaw metadanych: abstrakt i słowa kluczowe (w obu językach) oraz notę biograficzną autora i dane do kontaktu z nim.

Podtytuł czasopisma – *Studia Informacyjne* – podkreśla interdyscyplinarny charakter jego profilu tematycznego, który obejmuje szeroki zakres problemów podejmowanych przez dyscypliny akademickie i dziedziny działalności zawodowej związane z zapewnianiem dostępu do utrwalonych zasobów informacji i wiedzy oraz ich wykorzystywaniem przez współczesnego człowieka i współczesne społeczeństwo. Czasopismo publikuje też artykuły prezentujące teoretyczną refleksję o praktycznej działalności informacyjnej prowadzonej w różnych dziedzinach i obszarach życia społecznego, a także wyniki badań służących poznaniu różnych uwarunkowań tej działalności oraz doskonaleniu jej metod i narzędzi. Na łamach ZIN publikowane są także artykuły poświęcone metodologii badań informatologicznych, historii nauki o informacji oraz edukacji w zakresie nauki o informacji. Profil tematyczny półrocznika ZIN – *Studia Informacyjne* obejmuje m.in. problematykę:

- usług informacyjnych w instytucjach nauki, kultury, biznesu, edukacji i administracji,
- zarządzania informacją i wiedzą,
- komunikacji naukowej i cyfrowej komunikacji naukowej,
- organizacji informacji i wiedzy,
- teorii i praktyki metadanych,
- zagadnień Web 2.0,
- zagadnień Sieci Semantycznej,
- architektury informacji,
- projektowania użytecznych serwisów informacyjnych,
- humanistyki cyfrowej,
- interakcji człowiek – komputer,
- przetwarzania języka naturalnego,
- wyszukiwania informacji,
- wykorzystywania informacji i zachowań informacyjnych użytkowników,
- społecznej recepcji nowoczesnych technologii informacyjnych,
- kultury informacji,
- kompetencji informacyjnych i cyfrowych,
- polityki informacyjnej,
- etyki informacyjnej.

Zagadnienia Informacji Naukowej – Studia Informacyjne adresowane są do wykładowców, badaczy i studentów nauki o informacji, a także praktyków działalności informacyjnej, krytycznie analizujących metody i narzędzia jej realizacji w różnych środowiskach dziedzinowych i organizacyjnych oraz polityków i donatorów działalności informacyjnej w różnych dziedzinach. Lektura czasopisma może też zainteresować wykładowców, studentów i badaczy innych dyscyplin, które zajmują się różnymi aspektami funkcjonowania informacji we współczesnym świecie.

Zagadnienia Informacji Naukowej znajdują się na liście czasopism punktowanych Ministerstwa Nauki i Szkolnictwa Wyższego. Czasopismo jest indeksowane w bazach: Central European Journal of Social Sciences and Humanities (CEJSH), Central and Eastern European Online Library (CEEOL), Library and Information Science and Technology Abstracts (LISTA), Polska Bibliografia Bibliologiczna (PBB), WorldCat, Polska Bibliografia Naukowa (PBN). Czasopismo jest zarejestrowane w European Reference Index for the Humanities (ERIH Plus).

Contents

The concept of information well-being in the context of information threats

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Abstract

Purpose: 1) to examine the presence of the term "well-being" (and its variants "informational well-being" (IW) and "digital well-being" (DW)) in the publications of Polish information science researchers; 2) to indicate similarities, differences and relations between the concepts of IW and DW; 3) to draw attention to information threats that destroy IW – in the perspective of information ecology; 4) to propose an original definition of IW in the context of information threats.

Methods: The presented research employs a qualitative approach, utilizing methods and techniques that include critical literature review, conceptual analysis, elements of the comparative method, and the citation pearl-growing technique.

Results and conclusions: In Polish literature on information science, references to well-being are scarce; information well-being has not been a research topic to date. The concepts of IW and DW, although similar, are not identical. The author proposes definitions of IW in the context of information threats.

Research limitations: Lack of sufficient digital versions of publications available for full-text search.

Value: The approach to IW proposed by the author is situated at the intersection of the research interests of information ecology, information behaviour, information management, and information literacy.

Keywords

Digital well-being. Information ecology. Information experience. Information literacy. Information resilience. Information threats. Information well-being.

Text received on the 15th of March 2025.

1. Introduction

In a world increasingly dominated by expansive technologies and continuous innovation, a human-centred research approach is particularly valuable. One of its key dimensions focuses on the *subjective well-being* of the individual, in contrast to *community well-being*. At its core, well-being reflects the interaction of emotional,

cognitive, social, and behavioural components, capturing how people feel, think, relate to others, and act across different areas of their lives.

Four key objectives guided the author's research: 1) to examine the presence of the term "well-being" (and its variants: "information well-being" (IW) and "digital well-being" (DW)) in Polish information science literature; 2) to identify similarities, differences, and interrelations between the concepts of IW and DW; 3) to highlight information threats that undermine IW from the perspective of information ecology; and 4) to propose an original definition of IW in the context of information threats.

Defining IW through the lens of looming informational dangers seems essential, given the unprecedented scale of the development of new informational phenomena that threaten human health in its broadest sense, as well as the growing need to create safer information environments in which people live, work, and rest. Achieving progress in this area largely depends on individuals who inhabit these environments, as they are the ones who engage with information, information technologies, and multiple contexts. Their actions, therefore, should follow informed reflection.

The information threats discussed in this article pertain to the everyday lives and professional activities of individuals and social groups. The analysis does not address issues related to national information security or military operations, such as sabotage, espionage, or subversion. Given the space constraints of this article, it does not attempt to compile a "catalogue" of the most significant digital and analogue information threats. Instead, it provides a brief overview of commonly recognised informational risks, which serves as context for the concept of IW and seems sufficient for this preliminary theoretical discussion of the subject.

The research problem is examined primarily within the framework of Library and Information Science (LIS). However, given the physical, psychological, and social components involved, it is clear that no single discipline can, on its own, produce satisfactory outcomes in studying IW. Therefore, priority is given to methodologies rooted in human-oriented and user-oriented, "humanistic" approaches. The study relies mainly on qualitative research methods.

Given the dynamic pace of transformation in (digital) information environments, the author focused on identifying the most recent literature and source documents on the subject. The selected materials include publications in both Polish and English from approximately the past dozen years. The search conducted in the Scopus and Web of Science databases began with an attempt to locate occurrences of the term *information well-being* (or *information wellbeing*). The goal was to identify documents in which the term appeared in the title, abstract, or keywords—either in one of its English versions or in Polish. For the Polish term (*dobrostan informacyjny*), the search queries in both databases returned no results. As of March 13, 2025, the results revealed a very limited presence of

the term: (1) fifteen documents in the Scopus database, spread across various subject areas, with only seven published between 2018 and 2023; and (2) only ten results in the Web of Science database, where a closer examination of abstracts and keywords indicated that the core term used in this article – IW – did not appear at all. The database retrieved only records in which the words *information* and *wellbeing/well-being* occurred next to each other, but not as an exact phrase. A similar situation occurred when the search was repeated in the specialised LISTA database (Library, Information Science & Technology Abstracts), which returned only one publication, which was found to be irrelevant. On the other hand, the Web of Science Core Collection revealed an impressive number of over 32 million documents linked to category 03 "Good Health and Well-being" (Sustainable Development Goals). This is confirmed by a strong representation of publications related to medicine. After filtering and limiting category 03 to the Web of Science subcategories *Computer Science*, *Information Systems*, and *Communication*, and further selecting the *Social Sciences Citation Index (SSCI)*, the number of relevant publications decreased to 40,110.

The absence of the term in titles, abstracts, and keywords does not imply its nonexistence in researchers' awareness or within the scholar publishing sphere, as will be demonstrated below.

Given the significant underrepresentation of studies on information well-being, the citation pearl-growing technique was also applied to guide the controlled selection of additional publications on the topic from different perspectives. In addition, full-text searching was employed for selected works. To develop the author's own conceptualisation of information well-being, the methods of literature analysis and critique were first used, followed by conceptual analysis. Elements of comparative research were also helpful in examining the relationship between the notions of information well-being and digital well-being.

2. From well-being to information well-being and digital well-being

2.1. Well-being

Well-being is a broad concept that includes a person's physical, mental, emotional, and social health. It is linked to positive feelings and the ability to function effectively (An *et al.*, 2023). Many international organisations continue to study both individual and collective well-being. For example, the World Health Organisation defines health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO, 2020, p. 1; see also the WHO-5 Well-Being Index). Individual well-being can be understood as a subjective

feeling of satisfaction, happiness, and fulfilment that arises from activities and experiences related to favourable life circumstances. In many studies on quality of life, well-being is regarded as a key indicator of social progress (OECD, n.d.). However, there is no single, universally accepted definition of well-being in the literature (Ong *et al.*, 2021). The methods and criteria used to assess it—and even the question of what exactly should be measured—remain subjects of ongoing debate (Diener *et al.*, 2017).

Organisations at various levels collect, monitor, analyse, and evaluate data on individual and societal well-being at global, regional, and national scales. The value of these measures lies in their ability to identify areas for improvement and guide actions to enhance people's well-being. Existing approaches to measuring well-being generally focus on three fundamental groups of indicators:

- Economic indicators (e.g., GDP per capita, unemployment rate, poverty indices), which assess living standards and economic welfare;
- Social indicators (e.g., education, access to public services, availability of drinking water, safety), which evaluate the overall quality of life; and
- Health indicators (e.g., life expectancy, morbidity rates, susceptibility to diseases, access to healthcare, and quality of medical services), which reflect the state of physical and mental health within a population.

Additionally, the United Nations has developed a set of Sustainable Development Goals (SDGs) that influence the well-being of individuals, groups, and societies.

As noted earlier, two main approaches to well-being dominate the global literature: the individual and the community perspective. The former is reflected in a substantial body of primarily psychological research on subjective well-being (e.g., Eid & Larsen, 2008; Diener *et al.*, 2017). The latter focuses on community well-being (Atkinson *et al.*, 2017), in which social engagement contributes to the *eudaimonic*[1] dimension of well-being—that is, a sense of belonging and social connectedness.

2.2. The presence of the term "well-being" in Polish information studies

Within the broader discipline of information studies, concepts such as user satisfaction, information comfort, and information security can be viewed as indicators of well-being. Although the term itself has rarely been used explicitly, the pursuit of information users' well-being can be traced in initiatives aimed at fostering healthy information needs, developing information literacy, shaping fulfilling individual and collective information environments, and in numerous theories of information

[1] There are two main positive conceptualizations of well-being: the "hedonic" approach, understood as the experience of "positive feelings", and the "eudaimonic" approach, which assumes the "realization of one's full potential as a member of society" (Simons & Baldwin, 2021, p. 990). Both perspectives should be considered in defining "information well-being" and in research on this concept.

behaviour—especially those concerned with affective aspects and the satisfying experience of information. Similar ideas also appear in information ecology and in (personal) information management.

The concept of well-being is undoubtedly central to the theory of information ecology. In his definition, Alexey Eryomin emphasizes that information ecology is "a science that studies the laws governing the influence of information on the formation and functioning of biosystems, including individuals, human communities, and humanity as a whole; on human health and mental, physical, and social well-being; and that seeks to develop a methodology for improving the information environment" (Eryomin, 1998, p. 251). Other representatives of information ecology—such as Davenport and Prusak (1998) and Nardi and O'Day (2000)—also highlight the importance of a satisfying relationship between humans and technology in emerging information environments.

In Polish information studies, the term "well-being" has not been recorded, for example, in the over 700-page compendium *Information Science* (*Nauka o informacji*, edited by Wiesław Babik, 2016), in the volume *Information Culture in an Interdisciplinary Perspective – Theory and Practice* (*Kultura informacyjna w ujęciu interdyscyplinarnym – teoria i praktyka*, edited by Batorowska & Kwiasowski, 2016), or in the book *Information Ecology* (*Ekologia informacji*, Babik, 2014) and other "ecological" works by the same author. Although no systematic research has been conducted in this area (partly due to the lack of digital versions of publications allowing full-text search, such as those of the SBP publishing house), only a dozen or so works by Polish information scholars have been identified in which the word "well-being" appears. As expected, most studies that consider some form of human well-being—usually psychological or emotional—have been carried out in the areas of information behaviour (Cisek & Krakowska, 2019a, b; Kisilowska & Mierzecka, 2018; Korycińska, 2020; Krakowska, 2017; 2019; 2020a, b; 2023), information ecology (Jachym, 2013; Materska, 2016; 2023), and information proficiency (Kisilowska, 2022). None of these publications uses the term "information well-being".

By linking information practices and behaviour (the visible dimension) with IW, the following questions can be posed: Which behaviour may foster IW by enhancing its potential and protecting it from risks, and which may pose a threat to IW, leading to an immediate or long-term decline in satisfaction or comfort? Can we identify intentional behaviour consciously undertaken by individuals to strengthen their IW? Are there unconscious habits whose effects may be either positive or negative for IW?

It is undoubtedly much more difficult to answer questions related to the subjective experience of satisfaction or dissatisfaction (the invisible dimension) when assessing the various factors that may contribute to IW. In this context, it seems important to determine the following: Are information users aware of the phenomenon referred to as IW, and how do they understand it? What attitudes do

they display toward it? How reliable is the subjective assessment of IW? What methods can be used to measure its level? How can IW be developed? Moreover, how can the degradation of IW be prevented?

Does it make sense to distinguish a specific state referred to as *information well-being* from overall human well-being? Researchers in information science are undoubtedly intrigued by the question of what this concept actually encompasses and what its distinctive features are. The research problem addressed here is therefore considered primarily from the perspective of the broad body of work in LIS (Library and Information Science).

Tracing the appearance of the term "information well-being" in Polish information science, one can point to a publication devoted to the concept of the ecosystem in science (Materska, 2021). In 2024, Małgorzata Kisilowska-Szurmińska presented a paper titled *Information Well-being: A Proposal for the Conceptualization of the Term* at the jubilee conference *50 Years of the Institute of Information Studies at the Jagiellonian University: Past – Present – Future* (Kraków, June 13–14, 2024).

2.3. Digital well-being and information well-being

The growing number of references to digital well-being (DW) in international literature over the past decade clearly highlights both the importance and the necessity of addressing multiple aspects of "healthy" relationships between people and digital information technologies and resources, as well as "healthy" information needs and practices.

DW encompasses a broad spectrum of factors related to the impact of modern technologies—including non-human agents—on physical, mental, and emotional health, social relationships, and interactions within digital information environments (Feerrar, 2020). Different approaches to DW emphasise distinct issues and contexts. According to Gui, Fasoli, and Carradore (2017), DW can be defined as "a state in which subjective well-being is maintained in an environment characterised by digital communication overload." Similarly, the UK higher education digital agency Jisc (2019, p. 8) defines DW as "the capacity to look after personal health, safety, relationships, and work–life balance in digital settings."

According to Gui, Fasoli, and Carradore (2017), DW is not only a state achieved by individuals through their digital competencies, but also a characteristic of groups whose norms and values contribute to the comfort, safety, satisfaction, and fulfilment of their members when engaging with digital media. Thus, DW can be seen as an extension of the general well-being values of both groups and individuals, which are culturally situated through established norms and values, within which these competencies are framed as collective DW skills. It is important to recognise these norms and values as a shared capacity to prevent conflicts between individual and collective interests. The extent to which a group's norms

and values are applied may also serve as an indicator of social cohesion. Examining the relationships among these factors and the implications of these constructs for well-being may bring us closer to understanding information well-being (Burke & Kraut, 2016; Chan, 2015; Przybylski *et al.*, 2021).

Some researchers suggest incorporating the perspective of digital well-being (DW) into information literacy education by paying greater attention to attitudes toward the internet as an everyday environment (e.g., An *et al.*, 2023; Kisilowska, 2022). Academic librarians also undertake initiatives related to digital literacy (Feerrar, 2020).

Against this backdrop of existing research, the present study seeks to identify both the distinguishing features and the shared dimensions of the phenomena encompassed by the terms "information well-being" and "digital well-being".

The most essential attributes of IW include the following: the quantity and quality of information reaching an individual, and how this information is received, processed, and used—that is, the quality and nature of information processing itself. The processed information originates from various sources (both analogue and digital). The individual evaluates information—its quality, truthfulness, reliability, timeliness, relevance, and usefulness—which requires intellectual and cognitive skills. The influence of information well-being on human life lies in the fact that high-quality information facilitates decision-making, problem-solving, learning, and skill development, thereby promoting mental, emotional, cognitive, and physical health.

IW can thus be defined as a subjective sense—or experience—of control over the consumption of information, both in terms of its quantity and quality. It is associated with positive emotions and effective information management, promoting mental, emotional, cognitive, social, physical, and ethical health. In other words, IW reflects a healthy relationship with information: an intentional, planned, and satisfying engagement with it, characterised by a conscious and positive participation in the information world. An individual experiencing IW deliberately selects the information he/she consumes, is capable of evaluating and filtering its quality, avoids information overload and related stress, and can consciously take an "information detox"—that is, disconnect from the constant flow of content when needed.

The key attributes of DW relate to how an individual uses—and is able to use—the benefits of digital information technologies and experiences the positive informational effects of digital environments. The information being processed reaches the user through digital technologies (digital information). An individual primarily evaluates digital technologies in terms of their safety (e.g., the impact of screens on health, "text neck," or "smartphone thumb"), reliability, usability (e.g., speed), platform neutrality, and inclusiveness, impact on human life: the use of technology should be efficient, safe (e.g., ensuring data security and privacy protection), and sustainable—meaning that it does not produce adverse effects but instead supports

satisfaction, as well as mental and social well-being. Maintaining a balance between online and offline life, along with practising digital hygiene (such as information detox), is also essential.

DW can therefore be defined as the subjective sense—or experience—of control over information technology and its influence on one's life, generating positive emotions. In other words, it refers to a healthy relationship with technology—the conscious and satisfying use of it as a tool rather than allowing it to become a dominant element of one's life.

Both phenomena are related but not identical. For instance, a person may take good care of their DW—by limiting internet use or reducing screen time—while still experiencing low IW, for example, by believing fake news or being vulnerable to misinformation. The opposite situation is also possible: an individual may rate their IW as high—being able to manage information effectively, distinguish fake news, and resist disinformation—while simultaneously overusing information technologies in ways that harm their mental or physical health. An overload of information, for example, can lead to stress and decision-making chaos.

3. Information well-being and information threats

Threats that generate a sense of uncertainty and fear stand at the opposite end of the spectrum from well-being. They can be defined as "a specific state of mind or consciousness that develops or has developed based on the perception of phenomena in the surrounding environment that the individual views as negative, unfavourable, or dangerous. In this approach, a threat belongs to the sphere of consciousness and has a subjective nature, since the most important factor is the assessment made by the individual" (Falecki, 2018).

With the rapid expansion of the digital environment, the range of information threats has become highly diverse, affecting individuals, groups, and communities alike. Without attempting a detailed categorisation, some of the most commonly recognized examples include: information overload, infodemic, information gap, information chaos or noise, information pollution or smog, informational waste or pathogens, informational disruptions (e.g., post-truth, fake news, deepfakes, disinformation, conspiracy narratives), cyberviolence and informational abuse (e.g., hate speech, trolling, doxing, intimidation), filter bubbles, information asymmetry, and technological, digital, or informational exclusion (see e.g., Batorowska, 2021; Bawden & Robinson, 2009, 2020; Wasiuta, 2019).

There is strong evidence linking the deterioration of IW with the psychological consequences of experiencing information threats, such as cognitive dissonance, attention deficit, information overload, information anxiety (also referred to as *infostress*), irritation, frustration, doubt, discouragement, lack of motivation, fear

of disconnection (FOMO—Fear of Missing Out), addiction to digital content (e.g., compulsive scrolling or doomscrolling), information avoidance, technophobia, and depressive symptoms—all of which negatively affect individuals' well-being and health (Babik, 2017; Ledzińska, 2009; Matthes *et al.*, 2020; Soroya, 2021). The term ill-being can encompass all these experiences.

Do existing information threats influence how IW is perceived and defined? One might assume that, when faced with the scale, diversity, and ubiquity of such threats, we become more acutely aware of the importance of IW for maintaining human health and a balanced relationship with information and information technologies. In the context of information threats, it becomes a central issue to develop individual or collective (social) information resilience, understood here as resistance to information-related disruptions. The concept of information resilience gained attention within the LIS community after the COVID-19 pandemic and the war in Ukraine, as it is often associated with social groups affected by crises, conflicts, or disasters—situations in which information flows are disrupted[2] (e.g., Nicol *et al.*, 2022). During crises, vulnerability to informational disruptions increases, while the capacity to cope with them decreases, making it harder for individuals in crisis to achieve IW.

In this context, practices such as information diet, information therapy, information hygiene, and digital detox (or digital detoxing) gain a stronger rationale. Likewise, engaging in well-being–oriented activities such as mindfulness, meditation, exercise, and self-awareness can help individuals and communities manage stress, anxiety, and other negative emotions while promoting both physical and mental health (Shaikh *et al.*, 2021).

It should be noted that until recently, digital health and well-being were not included in the development of digital competencies, including media and information literacy. However, this situation is gradually changing, as skills related to protecting one's health and well-being are increasingly being incorporated into the broader framework of digital competences. Protecting health and well-being focuses on "avoiding health risks and threats to physical and mental well-being when using digital technologies; protecting oneself and others from possible dangers in digital environments (e.g., cyberbullying); and being aware of the role of digital technologies in promoting social well-being and inclusion" (Global Alliance, 2018). An additional example of the growing connection between information literacy and well-being can be found in the emerging concept of *(digital) well-being literacy*, which has become particularly relevant in the workplace, especially in remote work environments. "Digital well-being literacy refers to individuals' ability to proactively choose the appropriate combination of digital communication platforms and tools, enabling them to understand and combine information to

[2] M. Krakowska (2020b) wrote about information behaviour in crisis situations.

enhance their well-being" (An *et al.*, 2023, p. 14). The ability to build well-being, often referred to as well-being literacy, is seen as a key factor in maintaining and improving well-being; however, as the authors point out, research in this area is still in its early stages (An *et al.*, 2023).

4. Conclusions

The results of the present study, from a terminological perspective, show that the term "information well-being" has not yet become a sufficiently prominent research topic to appear in publication titles, as a keyword, or as a term explicitly mentioned in abstracts. Nonetheless, it is occasionally used intuitively in the literature, often without any attempt to define or clarify its meaning. A particularly surprising finding for the author was the lack of references to well-being within the Polish literature on information ecology.

It can be assumed that scholars in the field of information science will naturally tend to associate the term IW with all user-satisfying relationships involving information, information technologies, or information institutions (such as libraries). In this way, DW may be understood—albeit with certain reservations—as an important component of IW. This interpretation seems justified, as the challenges of experiencing information in both analogue and digital environments share many essential similarities. These parallels are especially evident in efforts to develop competencies for coping with information threats, such as building information literacy, resilience, and security, as well as strategies for adaptation, acceptance, fulfilment, satisfaction, and the avoidance of stressors.

The growing wave of information threats underscores the need to develop concepts and methods that support individual well-being, including IW, which is closely linked to emotional, cognitive, and social well-being. The author proposes the following conceptualisation of IW in the context of information threats: the totality of positive information experiences accompanied by a high capacity to cope with information threats. Information experiences should thereby be understood as everything a person encounters and experiences in contact with information. This approach to IW lies at the intersection of research interests in information ecology, information behaviour (particularly information experience/information experiencing and its affective dimension), information management, and information literacy. These subdisciplines within LIS appear to possess the scientific potential necessary to advance understanding, interpretation, and practical support of IW.

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Pojęcie dobrostanu informacyjnego w kontekście zagrożeń informacyjnych

Abstrakt

Cel/Teza: 1) zbadanie obecności terminu „dobrostan" (i jego wariantów: „dobrostan informacyjny" (DI) i „dobrostan cyfrowy" (DC)) w publikacjach polskich informatologów; 2) wskazanie podobieństw, różnic i relacji pomiędzy pojęciami DI oraz DC; 3) zwrócenie uwagi na zagrożenia informacyjne niszczące DI – w perspektywie ekologii informacji; 4) zaproponowanie autorskiej definicji DI w kontekście zagrożeń informacyjnych.

Koncepcja/Metody badań: Zastosowano podejście jakościowe oraz metody/techniki: metoda analizy i krytyki piśmiennictwa, analizy pojęciowej, elementy metody porównawczej, technikę *citation pearl growing*.

Wyniki i wnioski: W polskiej literaturze informatologicznej odniesienia do dobrostanu są bardzo skąpe, dobrostan informacyjny nie był dotychczas podejmowanym tematem badawczym. Pojęcia DI oraz DC, chociaż podobne, nie są tożsame. Zaproponowano autorską definicję DI w kontekście zagrożeń.
Ograniczenia badań: Brak cyfrowych wersji publikacji dostępnych do wyszukiwania pełnotekstowego.
Oryginalność/Wartość poznawcza: Zaproponowane przez autorkę podejście do DI sytuuje się na przecięciu zainteresowań badawczych ekologii informacji, zachowań informacyjnych, zarządzania informacją i sprawności informacyjnej.

Słowa kluczowe

Dobrostan informacyjny. Dobrostan cyfrowy. Doświadczanie informacji. Ekologia informacji. Odporność informacyjna. Sprawność informacyjna. Zagrożenia informacyjne.

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Resilience and sense of coherence among information recipients from a media studies perspective

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„The paradox of the information society is that people are trapped in information. They shackle themselves by communicating and producing information. The digital prison is transparent".
(Han, 2024, p. 79)

Abstract

Objectives and Background: This interdisciplinary theoretical review aims to conceptualise two terms used to describe the well-being of recipients of media information: psychological resilience and a sense of coherence (SOC). The literature review offers a media studies perspective, presenting the social context of the so-called VUCA (volatile, uncertain, complex, and ambiguous) times and transformations in the theory of news (mediated information) from a recipient's perspective. The volatility, uncertainty, and complexity of the mediascape shape the characteristics of the information received, making recipients and their well-being the focal point of information research. The second part offers practical considerations, where features of media information are compared with the concept of SOC and the mental resilience of message recipients. The article introduces a new perspective, as the terms resilience and SOC bring significant changes to communication with contemporary recipients.

Approach and Methodology: The article analyses and critiques current literature on communication and media studies, as well as the psychology of media. Data on the frequency of searches for the analysed terms in academic databases support the literature review of media studies and psychology of media. The analytical tools come from two databases: Web of Science and Google Trends.

Findings and Conclusion: The media studies approach presents recipients' resilience as a trait, a process, and a state. The analysis also identifies characteristics of mediated information and the context of the mediascape in VUCA times as unfavourable to an individual's mental well-being.

Originality/Value: The article recommends further changes to media studies research, advocating a research agenda focused on recipients' well-being. It presents a rarely discussed concept of SOC in the recipient of information as complementary to their resilience.

ZIN 2025, *63*(1A), 22–37
DOI: 10.36702/zin2025.01.02e

Key terms:
Information overload. Media information. Resilience. Sense of coherence.
Text received on the 5th of March 2025.

1. Introduction

Information is a key polysemic concept for a media researcher, along with the concept of communication. Journalists, media workers, and public relations specialists communicate with recipients through the media to provide them with information.

Understanding mediated information as information generated by tools that preserve and document reality in the form of quantifiable data (Fox, 2007) is particularly practised within the cybernetic paradigm of media studies. The term, however, loses its instrumental unambiguity when, instead of mechanical automatization and a focus on controlling and communicating in systems, it is discussed from the perspectives of socio-cultural practices (Kulczycki & Wendland, 2014) and psychological mechanisms (Ogonowska, 2021), which offer a mainly anthropocentric approach.

This article aims to present the media studies perspective, that is, the theoretical "systematisation of research results in the diachronic dimension (development of research timeline) and the synchronic one (discussion of various research approaches)" (Mrozowski, 2024, p. 130). This original and selective review of the current academic literature on positive media psychology and communicology, along with the analytical tools Web of Science and Google Trends, is used to compare the characteristics of mediated information with terms used to describe the well-being of recipients of the current mediascape.

The dominant algorithmic networking and communication hyperactivity have resulted in the fact that the term "to be informed" has lost the positive connotation it had in the times of mass media, as it eludes the simple assumption that amassing information builds knowledge, which would guarantee development, or even progress, and benefit the audience. Leaving behind modernist illusions (Skrzypiec, 2023), while at the same time being aware of the tensions arising from VUCA times (Taskan, Junça-Silva & Caetano, 2022), it is worth investigating a shift in the way news is now analysed. This issue is the focus of the present review.

It is worth recalling what constitutes news. "It is not a mention, a flash, a dispatch, or a note. Instead, it is new information, not necessarily limited to one or two sentences. It is a dose of information (...), often attractively embellished by media workers, for example, by elements of infotainment. It is an idea, a pure 'sense'" (Kudra, 2010, p. 404).

Sobczak (2016, p. 98) adds that "the main purpose of news is to convey information about something, be it a few events, but also processes, phenomena or

issues. This purpose is exposed through the context in which the news is 'used', as it is emitted (...) mainly within the information (news) magazine. 'Information' in this context means: subordinate to its function of relating events." According to Sobczak (2016), many studies of classical news emphasise its pragmatic character, stressing that the purpose of information is to show phenomena rather than to comment on them. The requirement is for news publications to mainly highlight the cognitive (epistemological) functions, to remove subjective reporting forms, strive for maximum objectivity, with an emphasis on the impartiality of the sender – news reporter, and to be devoid of subjectivity.

The nature of news was first defined in media research by Wilbur Schramm in 1949. He described it as a communicative act which reports an event but is much more than the event itself. The report is new and remarkable and needs to become a public act before it becomes news picked up by the media. Much has changed in the mediascape since Schramm's time, and much research has focused on the negative consequences of its influence. However, today, a shift can be observed towards the well-being of information recipients.

When observing the dynamic socio-technological metamorphoses of the media, noticeable changes emerge in the evaluation of the resilience of *homo informaticus*, ever thirsty for knowledge. It is also clear that now is the right time to research how to protect recipients from the news. As Kudra (2010, p. 402) states, "the news phenomenon can be discussed in two aspects: communicative and psychological." Although it is still possible to actively and comfortably acquire various information, as well as to passively absorb a great deal of messages, the data available to recipients is overwhelming, and their reception contexts are highly diverse in the face of a great variety of media information sources.

2. Growing importance of media information in times of information overload

The term VUCA was coined in the 90's of the last century, though it gained importance after the 2008 financial crisis. In describing the main aspects of the social environment, with an emphasis on markets and institutions (including the media), it has boomed in the aftermath of the COVID-19 pandemic outbreak. It refers to a chaotic business, economic, and physical environment that all individuals face in their daily lives when communicating with each other via technology. The acronym VUCA describes an environment which lacks stability (Volatile) and is Uncertain, Complex and Ambiguous. It is now used to describe an environment where markets and societies function, including mediascape users (Rozbicka, 2024). It is worth noting that this mainly refers to the global North, that is, free-market, democratic countries, specifically neoliberal ones (Collyer, 2018). That is where information

society dynamically develops, thus suffering from information overload (Arnold, Goldschmitt & Rigotti, 2023; Woźniak-Kasperek, 2018), information smog and an infodemic (Materska, 2021).

Although there is no widely accepted definition of the associated phenomena mentioned above, they can be understood to mean a situation in which the recipient has access to so many potentially significant and useful pieces of information that they become a hindrance rather than a help. Researchers suggest that there are several interconnected causes of information overload: traits of the information recipient, characteristics and purposes of information and social and technological organisational processes (Arnold *et al.*, 2023, p. 2). The acronym VUCA encompasses just such multidimensional situations (Taskan *et al.*, 2022).

From the perspective of media studies, in volatile, changing environments, many aspects of communication undergo rapid transformation, conversion, or evolution, making it hard to consistently track predictable trends. One glaring example of disseminating temporally volatile information is social media, such as TikTok and its microtrends, which may last only one day but reach millions of users. In contrast, the volatility of communication patterns is clearly evident in ongoing debates over the evolution of generations of media users, with ever-new labels, for example, Millennials, Gen Alpha, Z, or currently Sigma.

Uncertainty of the VUCA era refers to the lack of unambiguous knowledge, not so much in relation to the causes of events, as it regards the uncertainty whether social events, considering their abundance and variety of sources, are sufficiently significant to become a meaningful and unambiguous reason to cause any reaction from the recipient. Uncertainty about the reliability of senders of various status, ranging from influencers to heads of government, or the multiplication of information from even one of them, when, for instance, a politician entertains the audience on Facebook and makes laws in parliament, may seriously decrease the motivation even to receive messages. This uncertainty is intensified by the non-hierarchical networking of information and its algorithmization within media bubbles, which abound in infotainment (a blend of information and entertainment content). This results in the recipient's escalating feeling of being overwhelmed, which in turn leads to their sense of helplessness in the face of the number of variables being sent. Woźniak-Kasperek (2018, p. 81) even writes about 'info-toxifying' the audience.

The third term in the VUCA acronym refers to the complexity of communication environments. It is characterised by the multidimensionality of connections and elements, making it difficult to understand the causes of communicative acts and interactions, including factors which generate problems and interference. When a situation is complex, this does not imply it needs to be volatile or uncertain. However, when it is neither stable nor clear nor unambiguous, and it is complex as well, that hinders analyses of the multifaceted interactions between senders and recipients and their multi-layered contexts.

When studying the complexity of the mediascape, it might be helpful to apply the media richness theory (MRT), which suggests that various media differ in their ability to convey messages and signals (Otondo *et al.*, 2008; Koczerka, 2011). It implies the effective use of a communication channel by matching the media richness to the task's ambiguity. However, the current crisis of representation, characterised by redundancy and the exaggeration of messages, in which senders focus on attractiveness and overuse persuasion, leads to the formal means being disproportionate to the content. A run-of-the-mill press release, for instance, about a new product from a well-known brand becomes a major event, or even a revolution, whereas a colour change is branded as a game-changer. Descriptions of individual events are dominated by large quantifiers, elevating their significance to the level of a historic event, and extremes such as all, always, or never populate the headlines of online media outlets, social media coverage, and politicians' live press conferences. Moderation, restraint and selection have been replaced by the glorification of the media consumer's freedom of choice.

Let us add the last term in the VUCA acronym — ambiguity — to describe the complexity of social life. Ambiguous, incompatible and contradictory communicative situations can be defined as ones where the components of communicative processes, that is, "who, what, where, when, how and why," responsible for the effects of communication, are difficult to identify (Taskan *et al.*, 2022, p. 198) or their definitional scopes are blurry or difficult to reconcile.

As Mrozowski (2024, p. 130) emphasises, "regardless of the adopted research optics, the research subject in media studies is always a set of relations, in fact inter-relations, between three elements: the media, recipients and their environment." Communication is a process. The classical structural-functional model of communication, introduced by Harold Lasswell in the 40's of the 20th century into media studies (Dobek-Ostrowska, 2007) has now become deceptive and insufficient, as it is becoming ambiguous who the recipient and the sender are, for example when there is a source dependency between a PR specialist and a journalist, and what the subject matter of communication is, for instance in the case of a brand's promotional materials, content produced by an influencer or a press release. The websites of regional and national press, overwhelming the recipient with screen content, are one example of this, where advertising is mixed up with information from journalists, and the journalists themselves write pieces inspired by marketing campaigns—the notion of who is who among the senders disappears in the noise of ambiguous content. A few sentences of facts are squeezed in between images of online shops, and the recipient's eyes are bombarded with layers of advertisements, pop-up notifications, or videos from other media channels, such as YouTube, which automatically switch on. In the case of audio media such as radio and podcasts, advertising breaks and the news make up an inconsistent hotchpotch. A single perception field holds a mix of numerous senders who communicate various messages in diverse forms.

There is also uncertainty about the clarity of the communicated content; for instance, it is taxing even to find the name of the writer(s), which leads to constant re-negotiation of interpretation. When ambiguity rules, the process structure is difficult to grasp, and its linearity is highly doubtful. The challenge lies in defining the stages of the communicative process, namely: who the sender is and what their motivation and sources of financing are, who the intended audience is, for example, is it a member of the public, a consumer, an organisation or an individual, a public or a private person, and where it is received, as the context of reception, particularly on mobile devices, has a continuous character. As Kudra (2010, p. 402) states:

> At present, in the age of electronic culture, the news is instantaneity: overt, uncensored information. It is also the possibility to generate information "from below," "from scratch," "from within," as seen in random "journalists-reporters" who film or photograph extraordinary natural phenomena with their digital cameras or mobile phones. It is the possibility to launch information "overlooked" by commercial media, but it is also the possibility to launch unverified, manipulated or dangerous information.

2.1. A shift towards the recipient's well-being as a remedy for the challenges of the VUCA sphere

Even the duration of the communicative process is volatile, uncertain, complex and ambiguous (Nowak-Teter, 2018). The mediascape is continuously accessible, and a mobile phone filled with news often accompanies the recipients while eating or sleeping. Even if they do not always decide to enter the mediascape, numerous notifications from electronic devices step in uninvited. To capture the different ways in which technologies mediate the recipient's perception and perspective of time, Nagy, Eschrich, and Finn (2020) coined the term *media time-hacking*. Furthermore, the deluge of ever-changing information means that determining when a message has been received becomes less useful, as it will soon be replaced by the next message: new, flashy, and quick. The overproduction of information makes it an illusory snapshot from the ever-changing kaleidoscope of social reality. It is the recipients who bear the cost of this ambiguity.

The VUCA era now thwarts the implementation of the positive postulates of the information society. As Han (2022, p. 139) remarks: "The mass of information and imagery offers fullness in which emptiness is still noticeable. More information and communication alone do not illuminate the world. Transparency also does not entail clairvoyance. The mass of information produces no truth. The more information is set free, the more difficult it proves to survey the world. Hyperinformation and hypercommunication bring no light into darkness."

There has been disappointment with information as a remedy for social ills. Since mid-20th century, there have been some terms widely circulating in media studies, such as *information society* (Ollivier, 2010) while others, for instance *knowledge industry*, *knowledge economy* and *knowledge worker* (Drucker, 1966) have been made popular by theorists of business management to encourage more effective

manufacturing processes, in line with the dominant belief that the more accurate and verified information there is available, the better communication and effects there can be.

Academic disciplines do not function in a vacuum; therefore, these terms have been used not only in economics but also in sociology, though in this case, there has been a more critical emphasis on the role knowledge plays in social change. For example, the term *knowledge society* coined by Francis Fukuyama (2017) or *network society* by Manuel Castells (2013) popularized earlier debates of media scholars Neil Postman (1995) and Alvin Toffler (1970) on the changing role of knowledge in the *vaudeville society*/The Society of the Spectacle (Guy Debord, 1967) and the transition from an industrial society into one that is based on the gathering, selling and publicizing knowledge for profit and pleasure.

Information has become the key element of a new form of society, along with an unprecedented acceleration of manufacturing technologies and the reproduction processes which condition them. Both Paul Virilio (2006) in *The Information Bomb* and Vilém Flusser (2024) in *Communicology* wrote about the speed of image processing at the turn of the 21st century. Tomasz Goban-Klas (2020, p. 75) states: "A fundamental change in the reception of media has been the introduction of digital forms of formatting and sharing, and therefore the reception of text, graphic and audio messages since the mid-90s." The extraordinary speed of the distribution of multimedia and multimodal information (O'Halloran, Pal & Jin, 2021), their overabundance, overproduction, but also control, have caused fundamental changes in practices and the nature of social inequalities (Borden, 2022), which, together with the development of research on the effects of these phenomena, has resulted in a shift of emphasis when describing communication processes.

The debate about media competencies, particularly digital ones, and the necessity of educating audiences, along with the self-regulation of broadcasters, control of information, and its open access, increasingly highlights not only educational demands, but also concern for the audience itself. Research on the scope of responsibilities and diverse media competencies of communication participants is no longer sufficient; therefore, the focus has shifted to good practices in digital hygiene, audience resilience, and emotional well-being. Analyses of threats in communication, illustrated by fake news, the power of algorithms, FOMO (Fear of Missing Out), information fatigue, and criticism of the media *per se*, have been steadily accompanied by the search for solutions and concern for the affective dimension of the mediascape. The so-called positive media psychology has developed (Raney *et al.*, 2021), and with it, media studies have been called upon to research the phenomenon of resilience among communication participants.

3. Outline of research development on the well-being of information recipients – resilience and a sense of coherence

"Positive media psychology is an area of research devoted to the analysis of processes and relationships associated with media use, leading to thoughts, feelings, and behaviours that contribute to an individual's well-being and development" (Raney et al., 2021, p. 2). This interdisciplinary area of research has its historical roots in the academic literature of (sub)disciplines such as communication and media studies, as well as (positive) psychology, book and information science, pedagogy, sociology, philosophy, economics, political science and marketing.

Positive psychology itself began to develop at the turn of the 21st century, following the famous American Psychological Association conference in 1998, where its chairman, Martin Seligman, announced the need for a paradigm shift in the research on mental phenomena and to redirect it towards the analysis of well-being. Researchers have intensified their exploration of positive emotions, behaviours, and cognitive mechanisms that support the development of a person's well-being (Seligman, 2019). Interestingly, Seligman himself gained recognition for his pioneering research on learned helplessness—an acquired state of negative valence, created by constant exposure to detrimental and unpleasant situations that are impossible to escape or avoid (Kolber, 2019). Noticing an excessive saturation of research on media pathologies, Seligman sought new ways for psychology to expand its understanding of human well-being. Consequently, he devoted many years of research to the formula for happiness alongside Mihály Csíkszentmihályi, the author of the famous concept of flow, a state between satisfaction and euphoria in which a person is fully absorbed in an activity (Seligman & Csíkszentmihályi, 2000).

"Positive psychology proposes a new perspective on the individual and aims to recognise and develop the best human potential. It emerged [...] as an expression of the desire for psychology as a science to best meet the needs and aspirations of contemporary individuals in their quest for a good life" (Trzebińska, 2008, p. 3). Clearly, studies on communication and well-being are in line with a significant dimension of this interpretation of the social practices of the VUCA era. Positive psychology has existed for scarcely thirty years; thus, the various approaches to studying 'media for good' have only received general recognition as a separate area of research relatively recently (Seligman, 2019). On the wave of development in positive media psychology, research on the concept of 'resilience' in social communication, including information studies, has been particularly prolific.

3.1. Media studies approach to recipients' resilience – trait, process and state

The term "resilience" has been soaring in Google Trends' general search results in Poland, with the peak recorded in the spring of 2021, in the aftermath of the

COVID-19[1] pandemic outbreak. Globally, the number of searches for 'resilience' has been continuously increasing since 2016 to date. There is a noticeable difference in science: the term is searched for much less frequently in Poland since 2023, whereas worldwide it has been gaining in popularity since 2005. In the Web of Science database, the phrases 'resilience' and 'media' generate over 10,000 results, mainly in environmental science, with over 570 in management and a similar number in public health. In contrast, the number of searches in social communication studies has exceeded 500.[2] It is worth noting that a search in Polish has returned only two academic sources on sustainability.

In the English-language media studies literature, 2018 and 2020 are noteworthy years, when two special and extensive issues of the *Journal of Applied Communication Research* (Houston & Buzzanell, 2018, p. 1) were published, focusing on the multidimensionality of resilience in communication studies. The international authors featured in these two publications distinguish four areas of research on resilience: individual-relational, communal, organizational, and national, which resembles the classic pyramid of communication reach by Denis McQuail (2012), indicating that the activity of mediascape users can be studied at the micro (intra – and interpersonal), meso (community and intergroup communication), macro (mass) and global (online) levels. As the authors emphasise, these areas overlap, and their study intends to be "provocative, not definitive, inclusive, and not limiting" (Houston & Buzzanell, 2018, p. 2).

Considering how resilience is shaped and developed at each level, the researchers have concluded that previous analyses have identified resilience as a trait, a tool for disruption repair, an accomplishment, or an entity. Therefore, from the media studies' perspective, resilience can be a trait of a communication participant, which is most often the recipient's trait, their strategy of coping with the difficulties posed by the communication context (instrumental communication behaviours) or a phenomenon analysed in the process formation, for example, becoming resilient while communication is underway. Consequently, resilience is developed, shaped, or framed, and maintained and reinforced throughout an individual's life and the development of their group relations, particularly within a family. In addition, resilience is described in these three areas: specifically, as a trait, a behaviour, and a process of building resilience, in communication occurring at the organisational, community, and/or national levels. As a complex phenomenon, it is also studied as a matrix (communication matrix) or a set of communication relations (cluster of strategies).

[1] https://trends.google.com/trends/explore?date=all&geo=PL&q=rezyliencja&hl=pl [accessed: 15.02.20224]

[2] https://www.webofscience.com/wos/woscc/analyze-results/9c8260fc-ca30-4830-827c--a971130e4d51-014bddee2d [accessed: 28.05.2025]

To summarise, media scholars, while drawing on various theoretical foundations, engage in discussions about resilience and demonstrate that there are many different theories of "communication for resilience" (i.e., boosting resilience). Research on resilience in communication focuses on three different trends: what conditions or hinders resilience, what causes it to manifest and what are the effects of its occurrence.

3.2. Sense of coherence among mediascape participants

This literature review has demonstrated the multidimensionality of the phenomenon of resilience. Resilience is accompanied by a number of interrelated constructs (Almedom, 2007, p. 254), such as fortitude, strength, hardiness, post-traumatic growth, recovery, and, lastly, self-efficacy.[3] From the perspective of media studies, in terms of usefulness for describing the changing functions and features of information, a term similar to resilience stands out among the others – the sense of coherence, SOC.

The term was introduced into academic literature in the 80s by Aaron Antonovsky, who, instead of analysing pathological factors negatively affecting health, developed the so-called salutogenesis in search of physiological and psychological stimuli that determine health. "A sense of coherence is the readiness, willingness, and ability to use the resources available to the individual" (Worsztynowicz, 2013, p. 42). These resources can differ in scope and be individual, relational/group, organisational, or cultural. **From the media studies perspective, SOC is the key element determining the extent to which an individual is effective in dealing communicatively with challenges encountered in their life, particularly when interacting with the mediascape.** The crux is how the recipient copes with information overload in the VUCA era.

SOC can be internal, involving intrapsychic mechanisms (self-manageability), or external, at the relational level (the sense of comprehending the surrounding environment and people). To define the constituent elements of the sense of coherence, it is helpful to use the specific components of an SOC orientation identified by Antonovsky (1995): comprehensibility, manageability, and meaningfulness. These concepts will be further discussed in the article in the context of communicative behaviours of mediascape participants. Considering Antonovsky's (1995, p. 34) psychological definition of SOC and approaching it from a communicological perspective, this phenomenon is examined below, with an emphasis on information management and participants' well-being in the communication process.

[3] It is worth noting that the Polish language also lacks clarity regarding the translation of these English terms. Health science and clinical psychology considerably expand the glossary of Polish words for the terms listed here.

The recipient's SOC is a global orientation, which conveys the degree to which a listener and/or viewer of changeable, uncertain, complex, and ambiguous information maintains a firm, durable, yet dynamic sense of certainty that:

- The stimuli the recipient receives throughout their life from the internal and external environments are structured, predictable, and explicable. In other words, the recipient can both identify and know the sources and structure of the information being processed;
- Resources are available, particularly media competencies, which may enable the recipient to meet the demands posed by these stimuli;
- To the recipient, these demands pose a challenge worth the effort and commitment, while efficient and effective communication may become a factor fostering a sense of meaningfulness.

As this description shows, such a sense of certainty is challenging to achieve and requires readiness, skills, and motivation. The communicative reactions of a recipient who has SOC can be active, through action and the willingness to engage communicatively, or passive, through merely watching or listening. A recipient who has SOC may either refrain from assuming the role of sender in response to the information they receive or may even completely opt out of receiving it by consciously cutting off the overwhelming stimuli.

The contemporary mediascape does not promote SOC, which consists of three factors: comprehensibility, manageability, and meaningfulness. Ultimately, according to the classic works of Pierre Bourdieu (2009), the news is unusual, short-term, and current. It is depicted as important, desirable, sudden, and unexpected, yet also repetitive, contrasting with other news, and relating to social elites and geopolitically important countries. Additionally, media information is personalised and... negative (Hendrykowski, 2016). In this context, SOC can protect the recipient from information overload, low mood, and the loss of 'media well-being.' The influx of mainly negative information remains an inherent part of the *media news feed*.

SOC is characterised by a sense of comprehensibility, yet the mediascape is neither coherent nor organised. Information appears unexpectedly, surprisingly, often introducing categories from various and contradictory discourses, describing social reality in a terminology incomprehensible to the recipients.

Negative news (especially of a geopolitical nature) does not promote a sense of manageability either; rather, it hinders recipients' use of their resources by presenting a threatening, uncertain reality. The media, drowning them in information, offer a multitude of possibilities and a variety of sources and advice, which often weakens resourcefulness by providing false pop-psychology solutions (DeVos, 2015). In addition, the advice and pointers available in the media are mainly consumerist in nature (buy it and you'll "save yourself" and benefit). Modzelewska's (2023) latest research demonstrates that young people are especially vulnerable to this. In the therapeutic culture propagated by the media, the outright pushy

promotion of various "challenges" and the continuous dissemination of success stories and media-scape heroes "bouncing back from failure" do not foster a sense of individual manageability.

Finally, the third component of the sense of coherence, according to Antonovsky, is a sense of meaningfulness: the belief in the logic of actions, the setting of goals, and the emotional conviction that life... has meaning. This is the paramount motivational component, which boosts the other two, comprehensibility and manageability. In the context of a sense of meaning for the recipient, it is worth referring to research on media storytelling (Ryan, Ruppert & Bernet, 2004; Page, 2016) and the characteristics of media protagonists. Some of this research indicates the continued relevance of media narratives that promote active protagonists who can serve as "good," motivationally useful models for recipients. However, in an era of postmodern, non-linear media narratives, social media, in particular (Mueller & Rajaram, 2022), often offer stories that are illogical and inconsistent, also promoting morally dubious role models, such as trash streamers. These phenomena require further investigation, though they seem to limit recipients' sense of meaning and impede their motivation to engage with the world.

4. Conclusion

Just as the media themselves are changing, so is the information they convey, which constantly seeks to persuade us. Sobczak (2016) believes the news is a rhetorical act.

As this paper indicates, the contemporary context of a volatile, uncertain, complex, and ambiguous social reality has changed the nature of news in ways that are not conducive to recipients' well-being. Consequently, the shift in research and concern for the resilience of communication recipients seems to be gaining academic significance. Upon inspection, the very nature of mediated information is not conducive to the recipient's resilience.

Contemporary news not only shows events but also imposes its interpretation. This is explained by, among others, framing theory (Entman, 2007), narrative media framing, and gatekeeping – news selection (Palczewski, 2015). "News is a tool used to navigate the recipient's attention, to set a certain order, and to attach meaning to the way they experience and understand the world" (Sobczak, 2016, p. 99). It may have resilience-boosting functions if the sender takes that into account. Sobczak lists the following functions of news: creational, model-making, evaluative, entertaining (giving pleasure) and stimulating. The researcher summarises the extensive media studies literature on this genre. She emphasises that the news has a cognitive and axiological dimension, since it concerns important social values. It also has an affective dimension, as it describes and evokes emotion, thus impacting the recipient's well-being, "touching" upon their mental resilience, particularly when it

stimulates and "moves" them. Such news induces difficult emotions, such as anger, shame, irritation, sadness, guilt, fear or frustration. However, it can also move the recipient or bring them hope, joy, relief, inspiration or pride.

"A sense of informational security in the VUCA times depends on information literacy as regards searching for and acquiring information (technical skill), interpreting information, including identifying persuasive messages and decoding the intentions of information senders, as well as the ability to make objective (emotion-free) judgments about content" (Batorowska, 2024, p. 43). However, this is insufficient, as it is not so much the knowledge as the affective dimension and the care for the well-being of media recipients that are gaining importance. Well-being can be a guide for regulatory actions in the area of mediated information.

As Mrozowski (2024, p. 30) notices, "media research is a fundamentally interdisciplinary field, and its characteristic methodological eclecticism, which was once considered a weakness and a flaw, has become, over time, its strength and merit – after all, hybridization is the main feature of contemporary civilization." The explorations in positive media psychology brought a shift of focus from pathological effects onto those related to improving quality of life. The term "resilience" has been gaining attention, as a trait and as a tool for the repair of informational disruptions, and as a desirable state. In the literature on media research, resilience can be described and diagnosed using the communication reach model in three dimensions: individual, organisational, and social (national). As demonstrated in this article, considerations of the well-being of communicators should also include another individual variable: a sense of coherence, which comprises comprehensibility, manageability, and meaningfulness. This article demonstrates how the characteristics of the news and the media landscape of the VUCA era – volatile, uncertain, complex, and ambiguous – require further analysis to better support the well-being of media news recipients.

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Rezyliencja i poczucie koherencji odbiorców informacji – ujęcie medioznawcze

Abstrakt:

Cel/Teza: Celem artykułu jest konceptualizacja dwóch pojęć służących do opisu dobrostanu odbiorców informacji pochodzących z mediów. Interdyscyplinarne opracowanie teoretyczne dotyczy psychologicznych terminów rezyliencji oraz poczucia koherencji odbiorców informacji w ujęciu medioznawczym. Artykuł bazuje na przeglądzie literatury. W pierwszej części opisano społeczny kontekst tzw. czasów VUCA, następnie przemiany teorii newsa (informacji medialnej) z perspektywy odbiorcy. Niestabilność, niepewność i złożoność mediasfery wpływają na charakterystykę informacji w polu odbiorczym, a dokładnie ogniskują badania informacji na jej adresatach i ich dobrostanie. W wymiarze praktycznym prezentowane jest zestawienie cech informacji medialnych z koncepcją poczucia koherencji oraz odporności psychicznej odbiorców komunikatu. Artykuł wprowadza nową perspektywę, gdyż pojęcia „rezyliencji" oraz „poczucie koherencji", wnoszą istotne zmiany w komunikacji ze współczesnymi odbiorcami.

Koncepcja/Metody badań: Posłużono się metodą analizy i krytyki aktualnego piśmiennictwa z zakresu nauki o mediach i komunikacji społecznej oraz psychologii mediów. Przegląd literatury przedmiotu z dwóch zakresów nauk o mediach oraz psychologii mediów poparto danymi frekwencji wyszukiwania analizowanych terminów w bazach naukowych. Narzędzia analityczne pochodzą z baz Web of Science i Google Trends.

Wyniki i wnioski: Opracowanie prezentuje medioznawcze podejście do rezyliencji odbiorców jako cechy, procesu i stanu. W wyniku dokonanej analizy opisano także cechy informacji medialnej oraz kontekst mediasfery czasów VUCA jako niesprzyjające dobrostanowi psychicznemu jednostki.

Oryginalność/Wartość poznawcza: Zaprezentowane podejście implikuje propozycje dalszych zmian na gruncie medioznawczym uwzględniających rozwój badań nad dobrostanem psychicznym odbiorców. Artykuł prezentuje nieczęsto omawiane poczucie koherencji odbiorcy informacji jako komplementarne do rezyliencji.

Słowa kluczowe:

Informacja medialna. Poczucie koherencji. Przeciążenie informacyjne. Rezyliencja.

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Practices and attitudes towards disinformation activities among students of selected fields of study related to media and information processing at Nicolaus Copernicus University in Toruń – preliminary study

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Abstract

Purpose: This article was created to draw attention to the practices and attitudes towards disinformation adopted by students of selected fields of study related to information and media, conducted at the Faculty of Philosophy and Social Sciences at Nicolaus Copernicus University in Toruń.

Methods: The research was conducted using a diagnostic survey method on a group of 150 people.

Results and conclusions: It turns out that all respondents use the internet every day, and the most significant element of verification turned out to be the source of information. Among disinformation techniques, fake news and trolling received the most indications. Similar techniques were also indicated for personal contact with disinformation, apart from the examples mentioned earlier; fake images and photos also ranked high. The respondents also indicated the primary motivations for disinformation activities, focusing on the creators of false messages on the internet. Issues related to vaccinations and the war in Ukraine were most often identified as content that is frequently subject to disinformation. Among the countries that spread false information, Russia was almost unanimously indicated. China, Belarus, and the United States came in further positions. Among the effects of disinformation, respondents stated that it primarily introduces chaos and divides public opinion. In turn, among the activities that increase resistance to disinformation, the most important was increasing the ability of recipients to verify the accuracy of information and data. According to the respondents, the two most important factors that can reduce susceptibility to disinformation are increasing recipient awareness and adopting a critical approach to the disseminated content. Among the most attractive forms of education in

ZIN 2025, *63*(1A), 38–56
DOI: 10.36702/zin2025.01.03e

this area for the respondents, the most selected were primarily: applications on the phone, online workshops and training, and computer games.
Value: Studies have shown that students in media and information processing majors are quite adept at recognizing the most significant threats in the online space. They are increasingly aware of the importance of education in this area and are able to respond appropriately to crisis situations.

Keywords:

Attitudes. Behaviours. Disinformation. Education. Fake news. Resistance. Students.

Text received on the 20th of March 2025.

1. Introduction

In modern times, the information space has been changing intensively, both individually and collectively. More and more people draw information about the world mainly from the internet, including social media. According to Centrum Badania Opinii Społecznej (CBOS, English: Centre for Public Opinion Research), at least 77% of Poles use the internet at least once per week. This phenomenon is most common among people under 45 years old, as well as among respondents aged 45 to 54. As many as two-thirds of the respondents aged 55 to 64 and half of those aged 65 to 74 reported using the web. Elderly people (age 75 or older) are still unwilling to use this source. Among them, only 1 in 4 people reported using the internet. An average internet user is a person aged 18 to 24. Most internet users have higher or middle education. 92% of the employed and 58% of the unemployed make use of it. The smallest percentage comprises farmers, and the largest comprises administrative and office workers, representatives of management, specialists, technicians, middle staff, and private entrepreneurs. Most internauts (96%) come from cities with populations of 500,000 or more, and the least of them come from rural areas (68%) (*Korzystanie z internetu*, 2024).

The internet is widely used to disseminate false content, as it is the fastest and most convenient way to reach potential recipients, whose opinions may be shaped freely. At the same time, we can observe that susceptibility to disinformation is distributed differently across social groups. However, the correlation between respondents' age and their social functions and their susceptibility to false or incorrect information is ambiguous. Some studies found that young people, often studying, were less susceptible to disinformation (Guess, Nadger & Tucker, 2019; Rosińska & Brzóska, 2020), while others show a different age distribution. In the report *Dezinformacja oczami Polaków* (2024), it was indicated that the oldest group of respondents was the most sceptical about false information, while young people showed greater support across the whole tested population. According to the authors of the document, 86% of Poles know what fake news is, while 82% say

they have been exposed to it. In Poland, the largest group exposed to fake news is people aged 55+. Moreover, these people are aware of the reasons why untrue information arises; hence, they are sceptical of published content and any conspiracy theories (maybe related to censorship implemented during the Polish People's Republic and the community's common lack of information). In the age division, the 18–34 group meets this term the least often. These people indicate that they draw knowledge about the world from the internet and social media. They are also much more willing to accept information from such sources indiscriminately. As the report's authors noted, these people become attractive targets for various groups of influence. They are easy to manipulate, and they perfectly fit the typical recipient of fake news that will be forwarded thoughtlessly. The effects of such behaviour may be dangerous, especially for future generations. It is worth noting a lesser susceptibility of the younger group of respondents to the false narrative of climate catastrophe and a greater susceptibility towards fake news concerning politics (*Dezinformacja oczami Polaków*, 2024).

2. Disinformation and related concepts. Deliberations on definitions

Disinformation is not a new phenomenon, but it is much more prevalent in modern times, mainly thanks to the web. Moreover, states and organisations have many tools to disseminate disinformation, whether through the activities of trolls or bots on social media or by leveraging ordinary, unaware users who share unchecked information. In the discourse regarding this phenomenon, the concepts of information war (also known as cyberwar) and fake news, which are closely related, are also present. Therefore, it is worth briefly defining basic categories of disinformation at first, especially since various theoretical approaches are presented in the literature on the subject.

Nadia Conroy, Victoria Rubin, and Yimin Chen (2016) define fake news in a narrow sense as untrue information disseminated to unsuspecting recipients. However, Chris Vargo, Lei Guo, and Michelle Amazeen (2018) understand it in a broader context, namely, as media reports and stories that have not been confirmed but are presented as news, or as entirely false reports disseminated to draw attention. Consequently, fake news is untrue or partially untrue information, often sensational in nature, that uses generally known truths, negative stereotypes, and beliefs. It often presents "half-truths", understatements, incomplete information, changed context, or applies to insignificant subject matters to distract people from those subjects that are important. Such information is conveyed in a way that leaves the recipient unsure where the checked information begins and ends (Demczuk, 2018, p. 95). Attention to an even broader perspective on fake news is brought by

Victoria Rubin, Nadia Conroy, Yimin Chen, and Sarah Cornwell (2016), who note that false information can arise without the intention of its creator. Additionally, Klaudia Rosińska and Paweł Brzóska indicate that several pieces of fake news have been created as fabrications, hoaxes, and mistakes of journalists, though people who disseminate such news treat them as serious information (Rosińska & Brzóska, 2020, p. 663).

Nevertheless, fake news is usually intended to deliberately mislead the recipient, for example, to achieve financial or political benefits for its sender. Fake news is challenging to verify, as it is not so easy to determine the source of such communication. The abundance of information and its rapid circulation are favourable to it because users often forward fake news, which spreads like a virus. It is frequently repeated by institutional media as well (Egelhofer & Lecheler, 2019). Consequently, such behaviours may cause permanent harm by undermining trust in journalism and encouraging recipients to use alternative news sources (Figenschou & Ihlebæk, 2019; Humprecht *et al.*, 2022, p. 149). However, numerous editorial staff already have tools to recognise fake news, e.g., Konkret24 in TVN. On the internet itself, users may use, for example, the CRAAP test (see Czerski, 2021), FakeHunter, NewsGuard, or Onemilliontweetmap.

Just as fake news, disinformation is defined in various ways as well. It may be understood as communicating information that is not in line with the actual state (Kowalska-Chrzanowska, Krysiński & Pamuła, 2024, p. 19). In a narrow sense, it is understood as a synonym of fake news. Vladi Volkff (1999, p. 8) believes that disinformation interpreted in that way is a single act, connected with a specific task, often amateurish, justifying a diversified arsenal of means. In a broad sense, disinformation involves techniques of influence, deployed over time to destabilise the enemy. It consists of systematically conveying false political signals, information, and fabrications to create a distorted image, rendering the analysis of the situation defective (Wachowicz, 2019, pp. 235–236). The definition above indicates a process consisting of the combination of repressive and subversive activities as well as conventional and unconventional methods (i.e., diplomatic, military, economic, and technological ones), which may be utilised in a coordinated way by state and non-state entities to achieve specific goals, whereby such acts are below the threshold of an official declaration of war. Thus, disinformation is a coordinated, long-term activity, which distinguishes it from the notion of fake news, though the sender of disinformation may use fake news. As Lynnette Hui Xian Ng, Ian Kloo, Samantha Clark, and Kathleen M. Carley (2024, p. 700) notice, "humans also share disinformation stories because they are sensational and exciting, thus collectively contributing to the widespread circulation of disinformation on a greater scale." Furthermore, disinformation is an unethical, highly harmful act aimed at spheres such as state security, the economy, and social relationships (see Hellman, 2024; Čechmánek, 2024).

Disinformation has existed since the beginning of communication; however, modern disinformation campaigns may be disseminated or amplified with automated and aggressive tools, such as bots, artificial intelligence, microtargeting, or paid internet trolls, often to increase the content's visibility in public spaces. Thanks to this, the entity responsible for such disinformation politics has significant influence on public discourse and behaviour, e.g., during voting (Allegri, 2024, p. 100), but also on attitudes and behaviours in other spheres, e.g., following restrictions related to the pandemic threat. As the experts from the National Security Bureau indicate (2019, p. 7), "disinformation may destabilise a situation in the state, affect its administration and decisive structures in a destructive way as well as undermine social, economic and cultural bases." Therefore, Christopher Walker (2018, p. 13) calls disinformation *sharp power*, which consists of the ability to weaken the enemy, to take control over media as well as academic, publishing, and cultural institutions in order to cause damage to them, and to create meaning and knowledge.

Disinformation may be an element of the impact of the policy of another state, which is connected, among other things, with information warfare, aimed at affecting the civil population, politicians, or information systems of another state through the dissemination of specific information in order to shape collective and individual consciousness compliant with the interests of the aggressor (Aro, 2020). The attacks are no longer aimed at the enemy's armed forces but at society: its consciousness, beliefs, and attitudes toward specific issues. Winning in such a conflict means disorganisation of the enemy's information, social, political, or economic systems (Aleksandrowicz, 2017, pp. 85 and cons.). There are three main areas of information warfare: cyberspace, infosphere (i.e., the area involving information systems not included in the network), and noosphere, an area of mentality encompassing not only individuals but also nations and social groups. The latter is the goal of information warfare (Formicki, 2020, pp. 101–102). In this way, it is possible to destroy social relationships, to impregnate the inhabitants of an attacked country with the ideas of the aggressor, and to call up-to-date knowledge into question.

The problem of disinformation, despite awareness of the accompanying phenomena and the countermeasures taken, remains significant, also in Poland. As the report *Dezinformacja oczami Polaków* shows, 84% of respondents have been exposed to fake news, and 91% have acknowledged at least one of them to be true. Moreover, according to the report, the prevailing sources of information about Poland and the world are: television (64%), web information portals (58%), and the radio (50%). It is worth noting that social media as a source of information was cited by 46% of Polish people, making it a more commonly used source than the press and scientific publications. The assessment of media's reliability presented by the respondents in the study also deserves attention. Furthermore, 79% of Poles report having been exposed to disinformation (after the definition of this phenomenon was presented to them beforehand), and 84% have been exposed to

fake news. 80% of the respondents stated that the phenomenon of disinformation has intensified recently (*Dezinformacja...*, 2024).

To sum up, the growing diversity of disinformation makes it more challenging to develop a universal typology. Most modern researchers assume that the intention of the source (disinformant), the content of the message, and the area of influence may be treated as criteria of the division. When it comes to the first type, the following categories should be distinguished: untrue or imprecise information created with the intent to mislead others on purpose (*disinformation*); false content being disseminated intentionally to cause damage to someone (*misinformation*); and information being sent with the purpose to cause damage to third parties (*mal-information*). The second type of disinformation involves the following types of false content: satire or parody, false connection, false context, misleading content, imposter content, manipulated content, and fabricated content. The third type, concerning the area of influence, comprises the following types of disinformation: political, economic, market, scientific and technical, intelligence, military, and international (Kowalska-Chrzanowska, Krysiński & Pamuła, 2024, pp. 28–40).

3. Methodological assumptions

The research among students of selected fields of study connected with information and media management, at the Faculty of Philosophy and Social Sciences at Nicolaus Copernicus University in Toruń, was inspired by the study carried out by Santiago Tejedor, Marta Portalés-Oliva, Ricardo Carniel-Bugs, and Laura Cervi on a group of 252 Spanish students of journalism. The researchers from the University of Barcelona observed that most students prefer web media as their primary source of information rather than social media. Furthermore, young people believe that politics is the dominant topic of fake news, which, according to the respondents, is mainly distributed by adult users via social platforms. A significant majority of respondents noted that fake news was created for political purposes, and one-fourth stated that a strong ideological component underpinned the disinformation strategies. The Spanish study also found that the students did not trust their ability to distinguish true from false information. Therefore, the scientists concluded that implementing initiatives and research to build media and information literacy skills was crucial for educating students at the high school level (Tejedor, 2021). Interested in the results of the Spanish study, the Polish Authors decided to assess the level of knowledge about disinformation among students at the University of Toruń, expanding the research group to include other fields of study associated with management and information processing.

The main goal of the study was to determine the sources of information used by students in the fields selected for the study (G1) as well as the methods they use

to verify news and data obtained (G2), which is connected with studying practices involving the internet. Assessing students' knowledge of disinformation in the selected fields (G3) was also significant to the Authors of the study. The group of attitudes to be studied includes reactions to disinformation to which respondents are exposed in the web environment. The Authors decided to answer the following questions:

How do students understand the notion "reliable source of information"? (Q1)

To what form of disinformation are the respondents exposed? (Q2)

What do the respondents know about disinformation? (Q3)

What is the knowledge of the respondents on methods of fighting against disinformation? (Q4)

How do students protect themselves from disinformation? (Q5).

The following research hypotheses were also formulated: **Women verify information more often than men (H1), Age affects the recognition of disinformation (H2), and Students of journalism and social communication have better knowledge of disinformation activities and are more resistant to them than students of other fields of study (H3).**

The study was conducted via a diagnostic poll method using a CAWI survey prepared by the Authors in Google Docs, consisting of 21 questions. An invitation to complete the survey via mail, from March to June 2024, was received by all students of all years in the selected fields of study associated with information and media at Nicolaus Copernicus University in Toruń: information architecture, media studies, as well as journalism and social communication. In accordance with data obtained from the dean's office of the Faculty of Philosophy and Social Sciences at Nicolaus Copernicus University, the number of students of the above-mentioned fields of study amounted to 538. One hundred fifty students completed the questionnaire, and the resulting sample accounted for 28% of the faculty's student population. Based on the obtained data, a quality and quantity analysis was made.

The questionnaire was divided into four parts. In the first part (demographics), the participants were asked to provide their demographic data and indicate their field of study. The second part (practices of using the internet) covered, among other things, the frequency and manner of using the internet, the assessment of the reliability of information published on the web, and the most popular digital sources of information used by the respondents. In the third part (disinformation), questions were asked of the respondents about disinformation activities and the threats associated with them. The participants in the study were also asked to indicate, in their opinion, the main reasons for misleading users by publishing untrue information in the digital space. Questions about fake news and the threats associated with its dissemination, particularly via social media, were particularly significant. In the last section of questions (prevention and education), the Authors decided to examine how students protect themselves against the destructive effects

of disinformation and the measures they take to prevent it on the internet. The respondents were also asked about educational approaches that could better help them understand the phenomenon of disinformation and strengthen resistance to false communications appearing across various sources of information.

The sample was the main limitation in this study. Only 28% of students in the selected fields were examined, so the study's results cannot be generalised to the whole population. Furthermore, it should be noted that research conducted using surveys has its own limitations, such as the declaratory nature of respondents' attitudes and behaviours. At the same time, this is a field for further research that could attract students from similar fields of study at other Polish universities.

The datasheets were created using Looker Studio from Google and MS Excel. The analyses were performed using Python (3.11.8) and the libraries pandas (2.2.1) and factor_analyzer (0.5.1). To verify the hypotheses, a chi-square test of independence was conducted for selected questions.

4. Findings and discussion

In total, 150 complete responses were received. The survey was filled out by 92 women (61.3%), 52 men (34.7%), three non-binary people (2%), and three people who did not want to disclose their gender (2%). The study was participated in by students of the following fields of study associated with media and information processing at the Faculty of Philosophy and Social Sciences at Nicolaus Copernicus University: information architecture (65; 43.3%), journalism and social communication (38; 25.3%), media studies (47; 31.3%). The biggest group consisted of people aged 19–25 (138; 92%). The second place was occupied by students aged 26–35 (12; 8%). Participants in the study were also asked about their place of residence, allowing them to choose between city and village. The former was declared by 113 people (75.3%), while the latter by 37 (24.7%).

In accordance with the established assumptions, the study was divided into several key parts, within which the respondents were asked specific questions. The first group of questions concerned internet use. In the first place, a question was asked about using the internet, allowing respondents to choose one of the proposed answers. All participants (150; 100%) reported using the web every day. Verification of the information searched is highly significant; therefore, it was decided to check whether the students verify the data obtained from the internet against other sources. Seventy-six people (50.7%) admitted that they did, while 26 respondents (17.3%) said they definitely did. Twenty-five people (16.7%) could not state it, and 22 respondents (14.7%) said that they did not confirm the information in other sources. Only one person (0.7%) admitted not verifying data in additional sources.

In the next stage of the study, the respondents were asked to indicate what makes information published on the internet more reliable. In this case, three of the most important answers could be chosen. A source of information received most indications (136; 90.7%). The second place was occupied by "presenting an issue from various points of view" (89 people; 59.3%), and the third place by "support with an authority's opinion on the subject" (80 indications; 53.3%). The following positions were taken by the statements: the same information appears on other media (71; 47.3%); media to which the recipient trusts (65; 43.3%); and obtaining information from a person whom the recipient trusts (9; 6%). Participants in the study were asked whether they had been exposed to false information on the internet. The significant majority (88%) admitted that they were. As many as 70 people (46.7%) reported contact with such data several times per week, while 30 people (20%) reported contact several times per month. Nineteen people (12.7%) reported struggling with this issue each day. Eighteen respondents (12%) could not state if they had met such content on the internet. Nine people (6%) chose the answer "once per month," while 4 (2.7%) chose "once per week."

The first group of questions ended with a question about the most commonly used digital sources of information by the respondents. In this case, they could choose any number of answers, or put down their own if it was not on the list of choices. The latter was chosen only 8 times, with the following answers provided: the radio, podcasts, newsletters, phone applications, and others. Most indications were obtained by: social websites (139; 92.7%), websites containing video materials (99; 66%), the most popular web portals (92; 61.3%), instant messaging clients (68; 45.3%), and independent web portals (64; 42.7%). The further positions were occupied by press sites and television information programmes (both options were indicated 42 times; 28%). Only 21 people (14%) indicated blogs.

The second part of the questionnaire dedicated to disinformation began with a question about the most commonly used forms of disinformation on the internet. In this case, the respondents could choose three answers that were the most important to them. Fake news was indicated the most often (140 times; 93.3%). The second position was occupied by trolling (87; 58%) while the third one by fake photos (76; 50.7%). Forty-nine people (32.7%) indicated fake video materials and deepfakes, while 47 respondents (31.3%) mentioned bots. Conveying information from false accounts was mentioned 40 times (26.7%), and only 11 people (7.3%) reported publishing fake recordings. In reference to the first question, in the second one, it was decided to ask respondents which of the proposed forms of disinformation they were exposed to. Also, in this case, three of the most important answers could be chosen. It is worth noticing that, similarly to the previous questions, fake news (128; 85.3%), fake photos (76; 50.7%), and trolling (75; 50%) received the most indications. The remaining positions were occupied by: bots (56; 37.3%), fake videos (55; 36.7%), and the dissemination of information from

false accounts (47; 31.3%). The option "publishing fake recordings" (13; 8.7%) was the least frequently indicated.

One of the purposes of the study was to determine whether students know why disinformation is used on the internet. Therefore, it was decided to ask them about it, suggesting that they choose three answer variants from thirteen. It was also made possible to provide one's own option. The answer "misleading the public opinion" was the most often indicated (74; 49.3%). The option "distraction from other matters, events, etc." occupied the second place (65; 43.3%). A similar number of votes were received for the answers: making recipients adopt attitudes consistent with the disinformant's intent (52; 34.7%), making recipients behave in specific ways (50; 33.3%), and generating negative opinions about other people (51; 34%). The following options among those proposed were significantly less popular: evoking a sense of danger (34; 22.7%) and creating an untrue image as a basis for a defective analysis of the situation (31; 20.7%). Only 19 people paid attention to generating negative opinions on other nations (19; 12.7%). In turn, as many as three propositions among those given were chosen by 16 respondents (10.7%): evoking uncertainty, misleading recipients about real trails, and obtaining vulnerable data from recipients. Fifteen students (10%) indicated getting the effect of surprise, while 10 (6.7%) chose the option "creating an untrue image as a basis for taking a defective decision." Only one person (0.7%) provided their own answer to the question, recognising publicity as one of the primary purposes of disinformation activities on the web.

Nearly as important as identifying reasons for disseminating untrue information was delving into the issue of who sends such content. The respondents were asked who was most often responsible for generating false messages on the web. As many as 144 people (96%) stated that the users of the internet who thoughtlessly convey received communications were mostly at fault. The following groups were represented: people trained explicitly for this purpose (82; 54.7%), politicians (78; 52%), and editors of web portals (71; 47.3%). Forty-two people (28%) indicated representatives of authorities, 18 (12%) noted intelligence, and 17 (11.3%) mentioned special services. Variants proposed by the respondents themselves received the fewest responses (each with one indication): Russian trolls, each of us, and troll farms.

In the next stage, a question was asked about the false information students are most often exposed to on the internet. In this case, any number of answers could be chosen. Most indications were obtained by two issues: vaccinations (131; 87.3%) and the war in Ukraine (127; 84.7%). Next positions were occupied by such subjects as: 5G technology (107; 71.3%), refugees (99; 66%), climate change (90; 60%), flat Earth and abortion (88 indications each; 58.7%), sexual minorities (79; 52.7%), ethnical and national minorities (77; 51.3%) as well as greenhouse effect (72; 48%). Single indications were obtained from the following subjects, among others: Palestine, pop culture, depression, EU law, and the life and health of public persons.

In the face of the information war, a group of states is most endangered by disinformation. It is well known that such activities are carried out by authoritarian powers, who aim to weaken their enemies, especially by creating chaos among the inhabitants. In the following question, the students were asked which states conduct the most active disinformation activities on the internet. Most people (137; 91.3%) indicated Russia. Next places were occupied by: China (86; 57.3%), Belarus (60; 40%), and the USA (59; 39.3%). Thirty-four people (22.7%) indicated Israel, 23 (15.3%) mentioned Poland, 15 (10%) said Iran, and 12 (8%) said Ukraine. The least frequently mentioned states were: Iraq (10; 6.7%), Germany (6; 4%), and North Korea (4; 2.7%). Single indications were obtained from Saudi Arabia, Libya, and Lithuania, among others.

The next question raised the issue of threats brought to cyberspace via disinformation. The respondents could indicate three of the most important answers, also in this case. Most people (111; 74%) indicated creating chaos. One hundred one students (67.3%) mentioned division among citizens. Fewer people (68; 45.3%) noticed destabilising the social situation. Forty-two people (28%) mentioned intimidation, 38 (25.3%) radicalisation of society, 31 (20.7%) destabilising the political situation, and 28 (18.7%) weakening the recipients' decisiveness. The following propositions received the fewest responses: a decrease in national safety (20; 13.3%) and destabilising the economic situation (11; 7.3%).

The group of questions on disinformation was closed, and the group on building resistance and protection against this phenomenon was opened. The students were asked about measures that should be taken for this purpose. Most people (115; 76.7%) noticed that the best way to protect themselves against misinformation is to increase recipients' ability to verify data. The second place was occupied by two options: encouraging recipients to verify the correctness of the data and increasing opportunities to verify the sender of the information (90; 60%). Almost half as many people indicated: limiting anonymity of the sender (47; 31.3%) and not supporting untrue information with opinions of experts (35; 23.3%). Twenty-three people (15.3%) highlighted the importance of facilitating the publication of content by web portal users with proper competences, while 19 respondents (12.7%) emphasised the need to support information with reliable video materials. A bit less (17; 11.3%) indicated numerical data as an element, making the found information more believable. For 11 people (7.3%), the most important way to avoid disinformation is the opportunity to contact the sender. Single indications were obtained from answers that participants in the study could propose on their own, among other things: education, contexts below posts, and prevention.

The last question raised the recipient's susceptibility to disinformation. Indication of the three most important answers from the list, or the presentation of one's own options, was also possible there. Two propositions received nearly equal numbers of responses: increased recipients' awareness of the existence of disinformation

(66; 44%) and a critical approach to information (64; 42.7%). Slightly fewer people (58; 38.7%) noticed the decrease in the rush of information. Forty-five respondents (30%) indicated an increase in recipients' knowledge of the forms of disinformation. The popularisation of knowledge about methods to secure oneself against disinformation and the limitation of the rush (pace of life) received the same number of responses (31; 20.7%). The following positions were: closing false social media accounts and punishing people who mislead others (28 indications each; 18.7%), as well as introducing proper safety algorithms on the internet (21; 14%). Notice was taken equally often (20; 13.3%) of practical cooperation with social media administrators and of organising social campaigns concerning threats. Nineteen people (12.7%) proposed introducing tools to facilitate the identification of false social media accounts, while 18 (12%) proposed introducing appropriate legal provisions. No one decided to provide their own answer.

The last group of questions concerned **education and prevention** against disinformation on the internet. In this part of the study, it was decided to ask students whether and how they engage in activities to increase their resistance to misinformation in the digital space. In the first question of this series, the respondents were asked what they do to prevent disinformation on the internet. Three of the most important answers among those offered could be chosen. The most often indicated options were verifying the source of information (134; 89.3%) and treating anything found on the web with caution (133; 88.7%). Slightly fewer people reported seeking confirmation across several sources (128; 85.3%). Looking for confirmation of one's opinion among experts in a specific field was indicated only 47 times (31.3%). Eight people (5.3%) admitted to doing nothing to reduce their susceptibility to disinformation.

In the fight against misinformation on the web, practical educational activities may play a significant role. Therefore, it was decided to raise this issue at the end of the study, offering the same list of propositions in the last two questions to the respondents, where any number of options could be chosen and one's own answer could be provided. In the question about the form of education on disinformation used until then, most people chose lectures (121; 80.7%). Significantly fewer indications were received by following propositions: workshops and on-site trainings (36; 24%), applications on the phone (30; 20%), online training (28; 18.7%), online workshops and computer games (20; 13.3%), as well as board games (6; 4%). Some of the proposed ways to gain knowledge about disinformation were mentioned: university classes, YouTube videos, documentaries, and informative materials found on the internet. The respondents were also asked what the best way was to convey the content on protecting against untrue information published on the web. Most people indicated applications on the phone and online workshops (77; 51.3%). The following forms of education were also mentioned as the most approachable: online training (71; 47.3%), computer games (66; 44%), lectures (59;

39.3%), on-site workshops (45; 30%), and on-site training (36; 24%). Traditional board games were indicated by 15 people (10%). Additional propositions included, but were not limited to, YouTube videos and social media campaigns.

The conducted statistical analyses allowed for verifying the hypotheses made by the Authors. In the first place, the results of the study negated the validity of the first hypothesis, which posited that women verify information more often. A test of linear correlation that was made for this purpose presented a significant relationship between gender and answer to the question: "Do you check out information published on the internet in other sources?" The z-score indicates that men verify information more often (Table 1).

Table 1. Relationship between gender and frequency of information verification

	Women	**Men**
Definitely not	1 (1.09%)	0 (0.00%)
Rather not	17 (18.48%)	5 (9.62%)
Hard to say	17 (18.48%)	6 (11.54%)
Rather yes	44 (47.83%)	29 (55.77%)
Definitely yes	13 (14.13%)	12 (23.08%)
Test statistics	**z-score**	**p-value**
152,000	2,035	0,042

Source: prepared by the Authors.

Unfortunately, **it was not possible to determine whether age influences** recognising disinformation. The study was participated in by students, among whom the majority were aged 19–25. A too uniform research sample prevented us from making such an observation.

The most important results were obtained during verification of the latter hypothesis. The Authors assumed that, given their future profession, students of journalism and social communication are the group best equipped with knowledge of disinformation activities; therefore, they are the most resistant to such activities. To verify this, a chi-square test of independence was conducted based on selected questions in the questionnaire. The answers provided to 4 questions among 13 covered by detailed analyses (table 2) allowed the Authors to state that, contrary to the hypothesis assumed at the beginning, it is **the students of information architecture** who have the best knowledge on disinformation activities and are the most resistant against untrue information published on the internet.

Table 2. The results of the chi-square test of independence in reference to one of four questions covered by a detailed analysis: Who does disseminate untrue information on the internet?

	chi^2-statistic	**Dof**	**p-value**	**p-corrected**
Politicians	6.529	2.000	0.038	0.191
Representatives of authorities	4.745	2.000	0.093	0.280
Editors of web portals	8.072	2.000	0.018	0.106
People particularly trained for this purpose	3.360	2.000	0.186	0.373
Special services	5.826	2.000	0.054	0.217
Internet users	0.257	2.000	0.879	0.879
Intelligence	14.139	2.000	0.001	0.006
Contingency table for significant relationships: inquiry				
	Information architecture	**Media studies**	**Journalism and social communication**	
0	50 (76.92%)	44 (93.62%)	38 (100.00%)	
1	15 (23.08%)	3 (6.38%)	0 (0.00%)	

Source: prepared by the Authors.

5. Conclusions

Based on the study, it can be stated that disinformation activities not only target elderly people, who are endangered with exclusion, but also, or maybe particularly, include young people. This is a group of recipients who should, seemingly, be more resistant to misinformation published on the internet, at least given their abilities to handle new technologies. It turns out that it is not always like that. Although most respondents verify information found on the web, their level of resistance depends mostly on their ability to use reliable sources and on whether and to what extent a specific message can be verified elsewhere.

As a result of the study, the majority of students gain knowledge from social media, video services, and the most popular web portals. These are places where internet trolling is common and increasingly difficult to verify. Without the ability to distinguish between fake news and reliable information, using social media becomes harder and harder. False content is often placed in advertisements, sponsored posts, or posts that imitate news from reliable sources. The study found that students usually reported no problems recognising fake news and were able

to identify suspicious content, such as untrue news, videos created with deepfake technology, or information disseminated by bots. Most respondents knew why disinformation activities were conducted and what threats they might pose in various fields of the state's operation. Considering that particularly trained people most often conduct such activities, students from all fields of study could indicate the most popular topics of disinformation, among other things: vaccinations, the war in Ukraine, 5G technology, refugees, and climate change.

Contentedly, it may be noted that most respondents are aware that the primary purpose of disinformation activities is to create chaos and destabilise the international situation. Above all, this issue is dominated by authoritarian states, often fulfilling their imperialistic ambitions (Russia) or striving to take economic control over lesser countries (China). The presence of the United States among the states identified by the study as also responsible for disinformation activities is not surprising, especially in the current political and social situation. Building resistance to disinformation is a hard, time-consuming process. As the Authors of this study determined, most young people are aware that the most important role in this context should be played by education, and that any activities should be undertaken not later than in the first stage of teaching. Treating found information with caution and verifying its source are important skills, but they will not entirely prevent other, increasingly effective forms of disinformation in the most popular sources. Regularly increasing competences and gaining knowledge in this scope are necessary. Among the most popular educational activities the students mentioned most often were online trainings and workshops, the best on their own and in a time frame comfortable to them.

The study shows that students in fields related to media and information processing report that they recognise the most serious threats in the internet space. They are increasingly aware of how important education in this context is and can respond to critical situations appropriately. This study may serve as an introduction to broader, comparable research as well as a starting point for further deliberations on education within the scope of searching, processing, and sharing information at various stages of education.

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Zachowania i postawy wobec działań dezinformacyjnych wśród studentów wybranych kierunków związanych z mediami i przetwarzaniem informacji na Uniwersytecie Mikołaja Kopernika w Toruniu – badanie pilotażowe

Abstrakt:

Cel: Głównym celem opracowania było poznanie opinii wobec dezinformacji i zachowań dezinformujących, które przyjmują studenci wybranych kierunków związanych z informacją i zarządzaniem mediami, prowadzonych na Wydziale Filozofii i Nauk Społecznych na Uniwersytecie Mikołaja Kopernika w Toruniu.
Metoda: Badania przeprowadzono metodą sondażu diagnostycznego na grupie 150 osób.
Wyniki i wnioski: Wszyscy respondenci korzystają z internetu codziennie, a najbardziej znaczącym i najczęściej wykorzystywanym elementem weryfikacji informacji według ich deklaracji jest źródło informacji. Wśród wybieranych przez respondentów technik dezinformacji najwięcej wskazań otrzymały fake newsy i trolling. Podobne techniki wymieniano

w odniesieniu do osobistej styczności z dezinformacją – poza wspomnianymi wcześniej, wysoko uplasowały się fałszywe obrazy i zdjęcia. Ankietowani wypunktowali także główne motywacje działań dezinformacyjnych oraz skupili się na twórcach fałszywych przekazów w internecie. Jako treści, które najczęściej podlegają dezinformacji, podawano kwestie dotyczące szczepień i wojny w Ukrainie. Wśród państw, które szerzą fałszywe informacje niemal jednogłośnie wskazywano Rosję. Na dalszych pozycjach znalazły się Chiny, Białoruś i Stany Zjednoczone. Wśród skutków dezinformacji ankietowani wybierali przede wszystkim wprowadzanie chaosu i dzielenie opinii publicznej. Z kolei wśród działań, które zwiększają odporność na dezinformację wskazywano głównie zwiększenie zdolności odbiorców do weryfikacji prawidłowości informacji i danych. Według ankietowanych najważniejszymi czynnikami mogącymi zmniejszyć podatność na dezinformację są: zwiększenie świadomości odbiorców i krytyczne podejście do rozpowszechnianych treści. Wśród najbardziej atrakcyjnych dla badanych form kształcenia w tym zakresie wybierano przede wszystkim: aplikacje w telefonie, warsztaty i szkolenia online oraz gry komputerowe.

Wartość poznawcza: Przeprowadzone badania dowodzą, że studenci kierunków związanych z mediami i przetwarzaniem informacji na poziomie deklaratywnym dobrze radzą sobie z rozpoznawaniem największych zagrożeń w przestrzeni internetowej. Są oni coraz bardziej świadomi, jak ważna jest edukacja w tym zakresie oraz twierdzą, że potrafią odpowiednio reagować na sytuacje kryzysowe.

Słowa kluczowe:

Dezinformacja. Edukacja. Fake news. Odporność. Postawy. Studenci. Zachowania.

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Designing an information service related to information avoidance

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Abstract

Purpose/Thesis: Based on the findings of a five-year research project conducted in Poland, the existence of information users in need of a professional information service has been confirmed. This service would involve providing practical support in the recovery of information behaviours repressed and replaced by a specific form of information avoidance. The article aims to operationalise these research findings by delimiting the content scope of the term; that is, to define the subject of the proposed information service.
Approach/Methods: The study employed methods of literature analysis and critique, semantic analysis, and a cyclically implemented comprehensive research and educational methodology. This included autoethnography, analysis of existing documents, reflexive thematic analysis, simulation method, design thinking, project-based learning, phenomenon-based learning, and the persona technique. Empirical material was collected through in-depth interviews and focus group interviews. During the research and development process, prototype evaluation was also conducted using the 9-level Technology Readiness Level (TRL) scale.
Results and conclusions: A group of users exists who, for various reasons beyond the current scope of research in information science, undergo a profound shift in their experience of information. Users perceive the consequences of this change as detrimental and seek remedies. To design a specialised information service tailored to their needs, it is necessary to characterise their condition using the language of information behaviour.
Research limitations: The article presents a conceptualisation of a term intended to define the subject of the proposed information service. This process is subject to the customary principles of scientific falsifiability. No other specific limitations were identified.
Practical implications: The aim is to develop a prototype of the information service and bring it to the highest possible level on the Technology Readiness Level (TRL) scale.
Originality/Value: This research contributes new insights to the existing body of knowledge on the experience of information and the typology of behaviours that reflect patterns of information avoidance. It also provides a foundation for implementing an innovative information service, previously absent from the market.

Keywords

Information abnegation. Information apathy. Information avoidance. Information professionals. Information services.

Text received on the 14th of April 2025.

ZIN 2025, *63*(1A), 57–87
DOI: 10.36702/zin2025.01.04e

1. Introduction

This article is a phenomenographic description of the course and results of a five-year research journey, which allowed me to empirically conclude that there are recipients on the Polish market who are looking for a professional information service that would provide practical support in recovering information behaviors that have been suppressed and replaced by a specific type of information avoidance (Cisek, 2016; Cibangu, 2023). My goal is to operationalise these research findings by defining the scope of the term that will be the subject of the proposed information service. In a first-person narrative documenting *a scholar's journey* (cf., e.g., Wallin & Diller, 2023), I retrace the winding path that led me to name this phenomenon 'information apathy.' In the course of my research, I have determined that in the environment I am familiar with for professional reasons, users experience a profound change in how they encounter information for various reasons beyond the scope of information science research. They perceive the effects of this change as unfavourable and seek a remedy. To design a specialised information service for these recipients, it is necessary to characterise their condition in the language of information behaviour.

2. Article structure and methodology

Since 2019, I have been collecting empirical material documenting people's experiences of various forms of information loss and deprivation. I do this simultaneously in three areas: as a researcher in the subdiscipline of information science, as part of academic teaching, and as an information professional running a one-person business. These three areas are closely intertwined and mutually dependent. Observations gathered while providing information services generate ideas for scientific research and teaching activities. At the same time, feedback, collaboration with students, and the results of scientific research shape the methodology of working with commercial service recipients. In my research, teaching, and implementation activities focused on the experience of loss and information deprivation, I used combinations of methods and techniques, depending on their context and purpose. In the case of service provision, I also employed client-focused approaches, as shown in Table 1.

The cycle of my research, shown schematically in Figure 1, was as follows:

(1) First, in the course of my research, I addressed the issue of information loss in a specific community of users, which led me to propose the working concept of information abnegation, which I discuss further below.
(2) In my commercial work, I began to encounter clients who fit the profile of a person affected by information abnegation and clearly expressed the need for professional support services that would allow them to escape from this state;

Table 1. Methods, techniques, and forms of working with clients from which the empirical material is derived

Area of Activity	Methods, Techniques, and Forms of Work	Years
Research	Methods: autoethnography, literature analysis and critique, examination of existing documents, reflective thematic analysis Techniques: in-depth interviews	2019–2025
Academic Teaching	Methods: simulation method (Janecka & Juźwik, 2020), *design thinking,* universal design method (Borawska-Kalbarczyk & Tołwińska, 2022; Karpińska, 2022), *phenomenon-based learning* Techniques: personas, in-depth interviews, focus group interviews, assessment according to the 9-point Technology Readiness Level (TRL) scale	2019–2025
Commercial Activity	Methods: autoethnography, examination of existing documents Techniques: in-depth interviews, focus group interviews Forms of working with clients: designing personalised services for people affected by loss or information deprivation	2019–2025

Source: prepared by the Author.

(3) Knowing that such a service was not available on the market, I introduced it as a central theme in one of the elective courses I taught in the field of information management at the Institute of Information Studies at the Jagiellonian University.
  (3.1) Using the set of teaching methods listed in Table 1, together with students from subsequent years, we created prototypes of such a service.
    (3.1.1) Depending on the needs and characteristics of the clients I met in my business practice in a given year, I created personas (Wójcik, 2023), which I embodied during simulated diagnostic interviews conducted with me by students.
    (3.1.2) Working with the persona I played took place in five stages provided for in the *design thinking* method: empathy, problem definition, idea generation, prototyping, testing (Sobota & Szewczykowski, 2014).

(4) I transferred the conclusions from the project work with students and elements of the prototypes created together to the service activity, testing individual solutions and supplementing the personas with new data, after which I began another iteration of the process described in point 3.

(5) I used the phenomena captured in stages 3 and 4, and continue to do so, in subsequent research projects, which means that both ends of the process are essentially connected in a cycle.

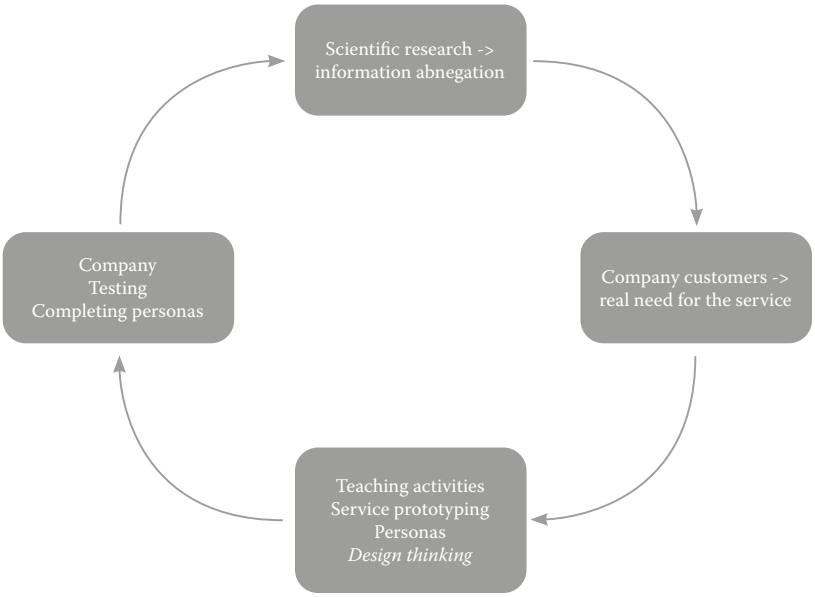

Figure 1. Research and design cycle involving students

Source: prepared by the Author.

I found ethical and substantive justification for this approach in the *phenomenon-based learning* methodology (Adipat, 2024; Czujko-Moszyk, 2015; Dewi, Widiana & Jayanta, 2024; Schaffar & Wolff, 2024; Wolff, 2022), which is part of a broader concept of building a university around the culture of experience authored by Grzegorz Baran (2019). This concept is based on five pillars:

"1) events and interactions as the basis for experiences; 2) people at the centre of events; 3) logistics instead of tactics; 4) participation; 5) vibrant university" (Baran, 2019, p. 198). Grzegorz Baran defines the latter term as "an environment that enables, supports, and stimulates interactions between members of the academic community and provides resources for the realisation of ideas, supporting creativity and focused on stimulating academic entrepreneurship" (Baran, 2019, p. 202).

The empirical material on which I base my considerations in this text contains content evoked and recorded during: 1) research on the loss of information by humanities scholars (Korycińska, 2020), 2) ongoing research on information mourning among retired Polish academics (Korycińska, 2023), 3) teaching activities, 4) diagnosing and serving clients as part of my own business activity in the information services sector, and 5) continuous autoethnography, which includes academic work, commercial services, and teaching. When I use the terms "respondent" or "research subject," I am referring to myself in my professional or private capacity, playing a role in simulations involving students, my company's clients, or the participants in the research mentioned in points 1 and 2.

Between 2019 and 2024, while working with students, we consistently used the term "information abnegation" in the name of the proposed service. Now that the prototype is ready for implementation, it is high time to assess the accuracy of this term. Without a precise definition of its semantics, operationalising the results of the students' research and project work will fail. The aim of this article is therefore to check whether "information abnegation" is a category that can be operationalised in the research and implementation process and, if not, to find a new, better linguistic label for the experiences of people whose unwanted consequences of information loss or deprivation motivate them to seek professional information services to help them cope with these consequences. The text is divided into two parts devoted to: 1) a critical dismantling of the concept of "information abnegation" and 2) the search for and validation of its replacement.

I want to clarify that, following Bronisława Ligara, I adopt the approach according to which a term, as a unit of specialised vocabulary, consists of a linguistic sign, i.e., a name (denomination) or, in other words, *a signifiant*, and the semantic content evoked by this sign, i.e., a concept or *signifé*. I am looking for a name (denomination) that aligns with the semantic content I identified through my research. Therefore, I always consider both elements together, treating the lexemes "term" and "concept" as interchangeable.

3. Dismantling the concept of "information abnegation"

In this section, I develop and refine the working definition of the concept of information abnegation, which I outlined in the text *Utrata danych i informacji w doświadczeniu naukowców: preliminaria* [Data and information loss in the experience of scientists: preliminaries] (Korycińska, 2020). Based on a thematic analysis of interview transcripts with 12 Polish scholars and materials gathered through autoethnography, I defined informational abnegation as an interpersonal, repetitive behavioural pattern. This pattern consists of the subject giving up informational behaviours that they had previously practised and assessed as adequate to their interests. In this sense, information abnegation is identified with negative information behaviour, characterised by a state of affairs where action is replaced by inaction. The semantic scope of the term "abnegation" seemed to fit perfectly with the nature of the behaviors described by the study participants, as, according to their statements, 1) they were a consequence or sign of generalized operational impotence and a dulling of the motivation that had previously driven their actions, 2) caused a deepening sense of weakness and even loss of agency and control over the course of one's own life, 3) led to the accumulation of various practical oversights and omissions, which became the cause of personal, financial, or formal and legal problems, and thus damaged the image, reputation, and self-esteem. From

the perspective of linguistic cognitive analysis, the respondents' stories were primarily guided by the metaphor of instability, referring to either a loss of balance (inability to remain upright) or downward movement: slipping, falling, collapsing, or degenerating. All these indicators were included in the connotation of the word "abnegation," which I determined based on dictionary definitions and examples of usage from the National Corpus of Polish. I present them below in a selection, noting immediately that the semantic elements of the "my" lexeme "abnegation" coincide with this denotation, but do not exhaust it.

> [1] abnegation (...) bookish renunciation of something; neglect of one's own comfort, appearance: Those who (...) have an innate tendency to distress, having recognised the inadequacy of speech as a means of communication, may end up in such abnegation as the philosopher Cratylus, who renounced words and resorted to giving signs with his fingers. [SJPWD]
>
> [2] He lived in one of the gardeners' houses in Włochy's suburbia, and his self-denial was taken to the extreme. He forgot about meals, shaving, washing, and often my father would grumble at him about his appearance. "Buddy, you need to shave." And sometimes he even reminded him to button his fly before class. He was utterly absorbed in physics and his invention. [PELCRA]
>
> [3] Divorced older men who had not found partners or had been abandoned by their younger ones managed the worst—a total self-denial, if not degeneration. Mr R., 60 years old, from Warsaw, has been working in a TV repair shop for eight years after his divorce. He has eight of them at home. He sits in an armchair, turns on each screen (tuned to a different channel), and watches them all at the same time. [Poliqarp]
>
> [4] "In periods of his life when self-denial became a necessity due to financial constraints, beneath his shabby clothes, he wore the manners of a chamberlain or a lover, brilliantly playing the role of an impoverished young gentleman in a constant taking place art entitled *Życie wewnętrzne i zewnętrzne poety, Jana Augusta Kisielewskiego* [The Internal and External Life of the Poet, Jan August Kisielewski]" – completed the picture Grzymała [Poliqarp]
>
> [5] It was the party that created such living conditions for Poles and shaped their human situation in such a way that Poles, wishing to express themselves or simply react to the most ordinary events, increasingly have to and prefer to resort to those channels of the Polish language in which aversion, self-denial, and contempt for life have accumulated for centuries, in which the awareness that life is not worthy of beautiful words has been growing for centuries, on the contrary: that the most disgusting words are just adequate enough to be used as raw material for reactions to life and the world... [Poliqarp]
>
> [6] – Look, Marylunia, how efficiently everything works here now (...) you have no idea how difficult it was at the beginning. Late arrivals, mess, laziness, self-denial. But it was worth the effort. Since I took them a little... since I disciplined them a little, things have been improving steadily. They study, they read. They report less, and when they do, it is for a good reason, not just for the sake of reporting. [MTAS]
>
> [7] abnegation [Latin *abnegatio* ‚refusal', ‚denial', ‚renunciation'], in ethics and asceticism, an attitude of renouncing material goods, feelings, intentions, an act of renouncing them for the sake of mercy, choosing higher values, self-improvement, or sacrifice. [EPWN]
>
> [8] I am not saying that Huta is immune to consumerism. The fact that we are sitting here is the best proof of that. We have abandoned the pipe dream that abnegation ennobles. Without consumption, and thus without the flow of money, it is impossible. We consume, but differently. [Poliqarp]

Citing so many source occurrences of the word "abnegation" may seem excessive. However, I consider it necessary to maintain the precision of the argument, and at the same time, consistent with the apparent tendency in information science

to organise terminology related to information behaviours (more on this later in the text) (cf. Hicks *et al.,* 2025; Krakowska, 2022; Sosińska-Kalata, 2023). The quoted passages can be divided into two groups. In each of them, abnegation is profiled in three layers: in terms of motives or causes related both to the personal characteristics of the subject and to objective circumstances (What does it result from?), in terms of external manifestations (How can it be recognised?), and in terms of evaluation (What judgment does it deserve?). The details of this typology, indicating the differences in the semantics of the use of the word "abnegation," are presented in Table 2.

Table 2. Composition of the semantic field of the lexeme "abnegation"

Group 1: fragments (1)–(6)		
Motives or causes	**Manifestations**	**Assessment**
A conscious moral decision to refrain from futile behaviour that does not bring the expected results (1)	giving up cultural and civilizational amenities (1)	flattering
personal trait in the form of non-standard attention management, and, as a result, non-compliance with social norms (2)	clumsiness, awkwardness, eccentricity, untidiness, poor personal hygiene	neutral
Group 1: fragments (1)–(6)		
Motives or causes	**Manifestations**	**Assessment**
Reactive response, of unknown volitional status (it is not known whether conscious or not), to a difficult life event (3)	abandonment of previous habits of an orderly life, prostration, lack of initiative, eccentricity	unflattering
poverty or material deprivation (4)	forced resignation from previous forms of caring for one's appearance	neutral
decline of the culture of coexistence in social space (5)	rudeness, abandonment of cultural codes, bastardisation of language, symbolic violence, degradation	unflattering
defect of character (6)	laziness, sloppiness, carelessness, lack of discipline, ignorance	unflattering
Group 2: fragments (7) and (8)		
moral decision to prioritise spiritual goods over temporal goods (7), (8)	mortification, deprivation, spiritual discipline, surpassing oneself	flattering

Source: prepared by the Author.

The specification in Table 2 for group 1 fully corresponds to the scope of the term "information abnegation," which I am testing for accuracy, including the predominance of negative axiological assessments. In the study from which this working concept derives, respondents notoriously expressed either guilt or at least embarrassment and discomfort regarding the decline in their information management skills. Their statements contained elements of self-accusation, self-blame, and negative assessments of their own behaviour (e.g., "indolence," "idleness"). However, fragments (7) and (8) are an exception, in which abnegation means renouncing material values. This is an undeniable fact, especially since this meaning prevails in English-language scientific discourse across disciplines. For example, a search in Google Scholar (allintitle: abnegation + "include citations" filter) returns about 100 scientific papers,[1] in which abnegation is mainly associated with terms such as *self-sacrifice, immolation, effacement,* and *donation,* and in only a few is it understood as resignation, abandonment, or cancellation. This shows that the layout of the domain —i.e., "the organised area of knowledge in the context of which the conceptualisation of [this] semantic unit takes place" (Taylor *et al*., 2007, p. 527) —is different from what I initially assumed. Meanings related to exalted asceticism are concentrated in the centre of the domain, while those denotations that I assumed to be ostensive occupy, if not the periphery, then certainly areas distant from the centre (Taylor *et al.,* 2007, p. 527).

I was close to giving up on trying to conceptualise this concept when, in January 2025, a groundbreaking article for me appeared in *the Annual Review of Information Science and Technology* (ARIST)*: Information avoidance: A critical conceptual review* by Alison Hicks, Pamela McKenzie, Jenny Bronstein, Jette Seiden Hyldegård, Ian Ruthven, and Gunilla Widén (2025). After reading it, I concluded that information abnegation essentially fits into the authors' new definition of information avoidance, which states that it is "From our analysis, we can now provide a definition of information avoidance as practices that moderate interaction with information by (1) reducing the intensity (amount and/or flow) across multiple levels of granularity; (2) restricting engagement with or control over information, whether actively, passively, or receptively, and/or (3) excluding information based on relevance, quality, and timeliness criteria" (Hicks *et al.,* 2025, p. 339). Here, I want to point out that the second premise of the definition contains the adverb *receptively,* which I have deliberately omitted, as the explanations provided in the article do not give me the certainty that I understand it correctly. The authors specify that: "Engagement consequently exists on a continuum of activity, which includes active and passive forms of contact as well as being linked to caution (Lloyd & Hicks, 2022) or receptivity to the likely implications of a subject or topic of information" (Hicks *et al.,* 2025, p. 336). It would follow that in this variant of

[1] I conducted the search on 8th of March.

information avoidance, the subject trivialises his/her contact with information or weakens their control over it because of their reaction (?) to the anticipated consequences of encountering its substance. However, I do not know how this type of behaviour relates to the qualifiers "active" and "passive," which is why I am temporarily disregarding this premise of the definition *of information avoidance*. The term *timeliness* used in the third premise also requires comment. I have translated it descriptively because, according to the authors, it is an assessment by the subject of the adequacy of information regarding their experience of immersion in time at a given moment, primarily in the affective dimension. This factor, which, according to the authors, has not been sufficiently researched, determines information behavior and causes people to reject information when, in their judgment: (1) it is not immediately useful, (2) they do not have enough time to understand, process, and accept it, (3) they lack the mental space for it, (4) they lack the drive in the form of a sense of urgency that would motivate them to deal with the information at that moment, without delay. Incidentally, although this is only my interpretation of the statement "a focus on timeliness also positions information avoidance as shaped by future time horizons" would be to add that we also avoid information because (5) at a given point on the timeline, we lose the ability to project ourselves into the future, so we assess certain information as unimportant, irrelevant to the rest of our lives, and therefore not worth the effort (Hicks *et al.,* 2025, p. 339). At this point, I would also like to highlight three conclusions from the article that are relevant to my further considerations. They regret that *information avoidance* has so far been: (1) insufficiently taken into account in information search models and, more broadly, in information behaviour models, (2) wrongly considered a pathology, never a "positive strategy that supports individuals in meeting their goals," (Hicks *et al.*, 2025, p. 339) (3) studied in isolation from the fact that actively seeking information can increase uncertainty rather than reduce it (Hicks *et al.,* 2025). I will repeat that the set of information behaviours that I have called, for my own purposes, information abnegation, can be almost completely described in terms of the definition provided by Hicks *et al.* The empirical material from which I draw my observations reveals a consistent pattern of behavior leading to a measurable narrowing of the subject's information horizon (Greenberg *et al.,* 2023) or, as Ferdinand Gonseth would say, to a shortening or even breaking of the informational axis of reference (fr. *référentiel)* within which a person establishes their world (Kaczmarek, 2003). However, the respondents' stories and my own testimonies, which I extracted using the autoethnography method, express something more: an unwanted and painful change in the way information is experienced (cf. Krakowska, 2023, p. 150). Although Hicks *et al.* do not explicitly declare that they adopt a phenomenological perspective, in my view, they imply this through discreet references to the need for a nuanced and holistic approach to the analysis of information practices (2025, p. 339).

What I called abnegation is not limited to a set of behaviours exhaustively categorised in the definition by Hicks *et al.* It is a mental state in which the subject perceives a painful reversal of the existing paradigm of life, informed by information. This state manifests in various avoidance behaviours, which are either forced by it or serve an adaptive function for the subject to cope with new circumstances (Case *et al.,* 2005). Knowing that the term "information abnegation" is indefensible for semantic reasons, I will use it one last time to signal that its meaning does not precisely duplicate the meaning of the term *information avoidance* and therefore deserves its own name. The core of abnegation is indeed the abandonment and avoidance of previous information behaviours, but it also includes a catalogue of additional specific features. I list these features below, with examples of authentic statements from participants in subsequent waves of the study (with gender endings masked and anonymised fragments omitted):

(1) The subject renounces behaviours that in the past were a tool for agency, control, and reinforcement of belonging, because they have become convinced that these behaviours are doomed to futility—nothing will restore the previous state of affairs, and repeating outdated behaviours is a painful reminder of the irreversibility of change.

> (I) "What is the point of reading, subscribing? I am already out of the loop; there is no point in kidding myself. Something like that. Something like that. When you are hungry, all you can think about is bread, so I would rather pretend I do not feel that hunger. There is no bread left. Gosh, how tragic that sounds... Like some war story. However, well, I said it, so let it be."
>
> (II) At some point, there is no point in looking for contact with people from that past life; they are moving away, as if they are fading away. They do not want to give anything, they do not want to take anything. You write something for them and send them interesting things, like you used to, but the only reaction you get is a thumbs-up on WhatsApp. You are gone, they are gone, that is it. Unfortunately, that does not mean it is easy to give up. It still tempts you for a long time."
>
> (III) "I wrote in various [anonymised] places, here and there. They read it. And then there was no one left to read it. Moreover, I stopped seeing myself in those texts; it disappeared. I stopped writing. (...) No, I do not even look there anymore. It is like a graveyard that I do not want to visit."

(2) The subject abandons informational behaviour because it no longer brings them joy, satisfaction, or excitement.

> (IV) "I used to love rummaging through [anonymisation]. It made me curious, and once my curiosity was satisfied, it was fun. That is how I would put it: fun. Now I feel indifferent. It does not occur to me to do it again."
>
> (V) "In the early 2000s, I used to run to the post office immediately whenever I received a delivery notice, and the post office was far away, without a car, inconvenient, an effort in any case. Moreover, I did not have the fear I have now, which is ‚oh my God, what will be in this package, what misfortune again'. On the contrary, even when there was a complicated administrative matter to deal with, I treated it seriously as a challenge. I immediately wanted to figure it out, analyse it, deal with it, write flowery explanations with Latin phrases, and so on. *Hodie quod non*."

(3) The subject refrains from information behaviour because he or she does not have the strength for it; he or she once had that strength, but now does not even remember where it came from. The feeling of powerlessness and inability turns into a fading will to act.

> (VI) "Sorry for all these automotive metaphors, I do not know what came over me today, I do not even like mechanical things. My engine broke down. It was a high-powered engine, and I switched to a moped. Alternatively, better yet: to one of those homemade tractors you sometimes see in the countryside. I cannot catch up with myself on a tractor like that. It is standing under some plywood shed, rusting away."
>
> (VII)„I have no strength, no strength. I am falling behind. Sometimes I feel as mossy as the rock man from The Neverending Story —you probably remember. And the less strength I have, the less I want to do anything. *Perpetuum immobile*, ladies and gentlemen."

(4) The subject experiences the abandonment of previous information-seeking behaviours as a personal diminution, a degradation of their abilities, an operational impairment that they would like to counteract but do not know how. This acquired clumsiness causes them suffering.

> (VIII) "It is like I am trapped in some kind of bulb, I do not know what to call it, like an atomic mushroom. Sometimes it makes me feel suffocated. I do not spend too much time on social media, no. No. It is like I just watch TikToks about procrastination over and over again, and as a result, I do not do anything."
>
> (IX) "Ever since you told me that I could get help, I have been resting on my laurels. I am doing even less, and when I feel guilty, I tell myself, ‚Do not worry, help will be available soon, everything will go back to normal.' I isolate myself from the awareness that it will not happen on its own. Pure magical thinking, there is no denying it."

(5) The subject abandons their previous information behaviors because, as a result of changes in the characteristics of the information itself, in the characteristics of the technological environment, and in their personal characteristics (these are the determinants of information avoidance listed by Hicks *et al.*, 2025, pp. 334–335), they no longer see offers in their information geography that would stimulate them to engage in these (or even any) behaviors.

> (X) "I think I am isolating myself from all these notifications about what I could do to keep up, to develop, and not just vegetate, as I am now. Before, I had eyes all around my head; I could spot announcements everywhere — like a course here, a training there, a certificate here, you know. Now I will not see it, even if someone made a poster and hung it above my bed."
>
> (XI) "Take courses on the use of AI, for example. I would take part in all of them, without fail. I say: I used to take them, not so long ago. Now I pretend that GPT chat does not exist. Not because I am afraid of it, or at least that is not the main reason. It is because, in my current state, I feel like I cannot afford it anymore. My entrepreneurial spirit has kind of burned out."

(6) In the subject's opinion, avoiding information does not bring them any benefits. The combination of related practices creates circumstances —on a fatalistic basis, because nothing can be done about it—where the subject feels diminished.

(XII) "All of this together is a great loneliness. A tunnel of loneliness. I feel totally exhausted at times, and at other times I have such bursts of energy that I suddenly start panicking, trying to get back on track and catch the threads that are slipping away. Hope dawns, and then a few days later, everything falls apart again, and I fall apart completely."

(7) A peculiar temporality: the subject perceives their condition as permanent, devoid of transience or impermanence.

(XIII) "I can describe exactly how it used to be and how it is now. I will describe it precisely. The difference is simple. In the past, time passed, and I was able to control that flow to a degree that is completely unimaginable to me today. There were diaries, schedules, all those little gadgets for planning tasks, Slack, Trello-morello [names of teamwork and task management applications, Slack and Trello], miracles, etc. Now, and here I will resort to poetry, there is no time. It flows as it pleases, and in fact, I have the feeling that nothing flows. Everything stands still and happens in the blink of an eye."

(8) The subject notes a decline in their sense of information security or loses it altogether.

(XIV) "I cut myself off from things that stress me out, like burying my head in the sand. When someone calls me on the intercom, my first thought is always: they're coming for me because I did not show up when summoned and did not pick up the letter. That is when I feel real panic, a hot flash to my head, my heart pounding. It is not pleasant."

I quote excerpts from the respondents' statements because they are relevant to reconstructing my train of thought. The material assigned to feature (1) is crucial because it led me to assume that the respondents continue to feel a change in the way they experience information. Excerpts (II) and (III) are almost literal quotations from Paul Ricoeur's writings, in which he expounded his hermeneutic thesis on the "primacy of being in speech," that "being-in-language," spoken and written, is the primary modus (way) of human experience (Wolicka, 2008). Here are Ricoeur's words:

> This emphasis on written mediation definitively undermined the Cartesian and Fichtean ideal, and to some extent also Husserl's belief in the subject's transparency to itself. In this respect, both the reader's subjectivity and the author's subjectivity have the same power over the meaning of the text. The semantic autonomy of the text is the same for the reader as it is for the author. For the reader, to understand oneself is to understand oneself in the face of the text and to draw from it the conditions for the emergence of a self other than the "I" that is "created" by reading (Ricoeur & Bobowska-Nastarzewska, 2005, p. 39).

As Elżbieta Wolicka writes, in Ricoeur's hermeneutics, participation in interpersonal communication immersed in language is "a necessary condition for the self-recognition of the subject – 'the one who is himself in relation to another' (*soi-même comme un autre*)" (Wolicka, 2008, p. 9; Ricoeur *et al.,* 2003). This is precisely what the respondent who is the author of statement (III) is talking about when he states that he "stopped seeing himself in [his own] texts," which no one was left to read, and as a result, "such a disappearance took place." He describes a fundamental change in the way he experiences information, consisting in the fact that after the collapse of the information ecosystem in which he had previously functioned, he lost the ability to establish his subjectivity by seeing himself in the

eyes of others: in this case, in the eyes of the readers of his written publications. Losing sight of his audience, he lost access to a part of himself, disappeared for others, but also disappeared from his own view. The eyes of those who were necessary for his "self-recognition" closed or slipped away. The authors of fragments (I) and (II), using powerful metaphors of starvation, being stuck in a landscape of war, and, again, disappearance, i.e., in essence, invalidation, which, since it changes the quality of experiencing one's own subjectivity, can be considered an ontological transformation (Sarbiewska, 2014, p. 263).

I will comment on the second and third traits together, as they have a lot in common. They express anhedonia (trait 2) and avolition (trait 3), meaning the disappearance of all emotional responses, especially positive ones, associated with active information-seeking behaviour, and a lack of will to act, respectively. I will start by defining anhedonia. In everyday language, this term, which comes from psychiatry and is considered one of the core symptoms of depression, although it also occurs in many other diseases, is understood, in accordance with its etymology, as a lack of pleasure (from the Greek: *an* – without, *hedone* – pleasure) (Rybicka, 2023). In medical discourse, however, it means something more, namely "significantly reduced interest or pleasure in daily activities" (Wieczorek *et al.*, 2018), with "neurobiological studies indicating that [it] is a complex construct reflecting various deficits in the reward processing process: anticipation, motivation, interest, and consummatory pleasure" (Gorostowicz *et al.,* 2024, p. 2). According to the established consensus, there are three types of anhedonia: consummatory, anticipatory, and social. In the first type, there is indifference to stimuli that the subject previously perceived as gratifying. In the second type, there is a loss of pleasure and excitement associated with the anticipation of the stimulus, which usually secondarily reduces the motivation to act, either to accelerate the event or to prepare the subject for its optimal experience. The third type refers to a lack of emotional and cognitive interest in interpersonal relationships (Rybicka, 2023). Medical definitions of anhedonia also point out that the impairment of the ability to feel satisfaction, i.e., pleasure from obtaining a reward, stems from the fact that the subject also has difficulty learning new forms of experiencing gratification "(the explicit or implicit acquisition of associations between conditioned stimuli that predict a reward and the reward itself), desire (a strong motivation to obtain a reward, which appears in response to a learned conditioned stimulus)" (Szczypiński & Gola, 2017, p. 66) and recognizing the value of the reward (Poyatos-Pedrosa *et al.,* 2024; Wong *et al.,* 2024). The above statements (IV) and (V) show that their authors meet the criteria for anhedonia in terms of information-seeking behavior (hereinafter also referred to as "IB"), as they attest both to the loss of access to feelings of satisfaction and to a decrease in sensitivity to previously effective impulses driving IB, especially curiosity, which Omas D. Wilson describes in his recent review article as perhaps the strongest psychological driver triggering IB, genetically related to the category of

information need, although not identical to it (Wilson, 2024, p. 53). Taken together, sections (IV) and (V) paint a picture of the subject's exhaustion of both intrinsic (also known as innate) cognitive curiosity, which triggers an interest in discovering new areas of information and a desire (desire = craving in medical terminology related to anhedonia) to reduce uncertainty and gaps in understanding, as well as extrinsic curiosity caused by the desire to obtain a specific reward, or at least a tangible result. I note that such a regression of curiosity is also described by the author of statement (X), who additionally signals a loss of so-called perceptual curiosity, i.e., increased receptivity to sensory stimuli (cf. once "eyes all around the head" – today "I will not see it, even if someone made a poster and hung it above my bed") (Wilson, 2024, p. 44).

Now it is time to elaborate on the term "avolition" [Pol. *awolicja*], which I linked to trait 3. It comes from the language of psychiatry, but unlike anhedonia, which also originates from there, it is not used in everyday language. As proof, I cite that a search for "awolic*" performed on March 8, 2025, across all three search engines of the National Corpus of Polish —POLIQARP, MTAS, and PELCRA —returned zero results. This means that the Polish lexeme *awolicja* refers exclusively to the semantic field of psychopathology. Therefore, it is strongly inadvisable to include it in the definition I am creating for the concept I originally called informational abnegation, for which I am currently searching for a more accurate *signifiant.* The avolition referred to by the authors of statements (VI) and (VII) is "a loss of will characterised by a reduced ability to take and sustain action" (Wójciak *et al.,* 2019, p. 543). They use highly evocative metaphors to convey the state of volitional incapacitation they experience. One of them (VI) compares his current volitional capacity to the power of a "homemade tractor," a clumsy vehicle that is emblematic of deprivation. The impression of decline and misery, juxtaposed with the former "diesel engine," is reinforced by the term "plywood shed," which strongly conveys provisionality and neglect. The second respondent (VII) projects himself onto a film character, a giant with a stone body who spends most of his life asleep and gradually becomes overgrown with vegetation, so that passersby mistake him for a grassy hill. However, he expresses the essence of his experiences in a strikingly literal way, using the occasional neologism *perpetuum immobile,* which is self-explanatory. Avolition is also described by the author of fragment (VIII), who recounts with self-irony how he falls into prostration, watching hours of films popularising knowledge about procrastination on the TikTok platform (Flayelle *et al.,* 2020; Starosta & Izydorczyk, 2020) as a form of escapist binge-watching.

In my opinion, the excerpts illustrating the fourth feature contain significant terms that refer to the concept of an epistemic bubble, as defined by Monika Krakowska in her monograph *Zachowania informacyjne człowieka w kontekście zjawiska epistemicznej bańki informacyjnej* [Human information behaviour in the context of the epistemic information bubble phenomenon] (2022). The authors of

statements (VIII) and (IX) recount, respectively, their experience of being trapped /imprisoned in a limited information space, first called a "bulb" and a moment later an "atomic mushroom," i.e., a poisonous, contaminated environment in which it is "stuffy," and deliberate self-isolation, descending into an information bunker and waiting there for someone to come and rescue them from their misery. The author of fragment (IX) comments on their behaviour in a reflective and revealing manner (exposing self-deception), calling it explicitly the result of "pure magical thinking." Both statements contain metaphors describing an information space that is either openly dangerous or seemingly safe, surrounding the subject or created by the subject through conscious isolation. I see a homology with the following definition:

> (...) a social, unstable epistemic structure in which the cognitive subject often accidentally and unconsciously, unintentionally omits various pieces of information, operating with a cognitive structure that limits the cognitive processes of understanding reality and creating knowledge. It is an information space shaped by the architecture of the information environment and the community's communication patterns. This space connects social networks, media, and other sources of information, along with the information behaviours that result from an individual's norms and worldview, which they share with the group. (...) Specific to an epistemic bubble is limited access to information resources, lack of access to information, the creation of an information space consisting of a moderate number of information sources, and undeveloped information horizons (Krakowska, 2022, p. 178).

According to Monika Krakowska's typology, this particular form of information avoidance that I describe would lead to the creation of a bubble covering mainly the individual space of the subject. The change in the way information is experienced would consist in the fact that *qualia,* i.e., perceptible phenomenal qualities (Gouveia, 2022), would begin to predominate in the subject's experience, the content of which he verbalises as oppression, confinement, impoverishment, loneliness, and hunger.

The fifth feature, secondary to the fourth feature and expressed in examples (X) and (XI), refers to the subject's experience of losing their previous informational affordances. This is directly indicated by statement (XI), in which the respondent—rather enigmatically at first glance—states that he "can no longer afford" to see useful, goal-oriented activities in his own information environment. He adds that "it is as if his entrepreneurial spirit has burned out." To interpret these words, I will use the definition of affordance adopted, among others, in enactivism. For representatives of this school of thought, it describes the encounter between an object that sends out clues (offers or, as it is translated into French, *invites/invitations*) about the possibilities of its use, and a subject capable of and willing to notice these invitations and then act on them. It is therefore a relationship between two agencies: the object and the perceiving subject (Fauré, 2019; Paveau, 2019). When translated into the language of affordance, fragment (XI) becomes clear: the author says that he has lost the resources that previously allowed him to enter into this relationship. He knows that the information objects populating his environment still send signals of availability and suitability for multiple uses; they still can, but he no longer can – one might say *he cannot afford it anymore.* He reveals that he

has lost his entrepreneurship, which in this context can be understood in two ways: 1) etymologically, and at the same time very faithfully in relation to the metaphor of the encounter between the subject and the object, as an inability to "take on" and adapt to his needs the offers made by objects; they call out, and he remains inactive because he has stopped hearing them, 2) by reference to the concept of information management in the spirit of agility, as a deprivation of agility and all the attributes that comprise it: quick-wittedness, flexibility, intelligence understood as "the ability to understand situations and respond to them purposefully" and cleverness (Juchnowicz & Wolińska-Skuza, 2021, p. 47). The deprivation is severe, since the author describes the state it causes as "vegetating."

I have identified the sixth feature, along with the accompanying fragment (XII), in order to clearly emphasise that the change in the way respondents experience information is devoid of the positive aspects of information avoidance described by Hicks *et al.* (2025), who call for their inclusion in the research agenda of informatics. Among the forms of information avoidance, consciously or unconsciously implemented by the subject and increasing their well-being, the authors indicate, among others: 1) selective isolation from information as part of self-care, in order to filter out content that the subject perceives as harmful, 2) consciously prioritizing contentment over information gain, which is gratifying to the subject when it results from their accepted hierarchy of priorities and is therefore a manifestation of adequate self-control; it is worth noting that this approach to information avoidance is a step towards rehabilitation – in the sense of removing axiological odium – e.g., practices referred to as sufficing, i.e., searching for information only until it is deemed sufficient. I fully agree with the postulate of Hicks *et al.* (2025) to address the gaps in research on the beneficial functions of information avoidance, and to break with its unjustified stigmatisation. However, there is no evidence in my research materials to support the claim that this complex of behaviours benefits the respondents. I therefore describe a phenomenological realisation of information avoidance that is entirely located on the "dark side," at the end of the spectrum where desolation, inertia, and helplessness reign. In the "tunnel of loneliness," as the author of statement (XII) puts it. In my opinion, this feature of the experiences reported by the study participants is the strongest argument for the advisability of separating them into a distinct conceptualisation within, or perhaps even on the borderline of, the concept of information avoidance. Why? Hicks *et al.* (2025) propose that information avoidance should henceforth be treated as inseparably linked to searching (and probably also to other IBs expressed in active behavior), and that the dialectical tension prevailing in this tandem should be considered a factor modulating the subject's encounter with information, in the image of two opposing but complementary forces, *yin* and *yang* (Hicks *et al.,* 2025, p. 340). The specificity of the experiences described in my study lies in the fact that a force with the opposite vector does not balance information avoidance. Dialectical tension

exists, but its poles are 1) avoidance here and now *versus 2*) the memory of being active there and then. In the conceptual model outlined by Hicks *et al.* (2025), information avoidance enters into a pendulum-like movement, balancing with other real actions of the subject. In my case, it is intertwined only with past reminiscences, i.e., with mental facts that are not externalised in actions. The tension between the present reality and the imaginary content in the form of memories is undoubtedly real for the subject, but qualitatively different from what Hicks *et al.* encode through the yin-yang metaphor. In my opinion, this difference results from the specific temporality of how participants in my study experience information, which I have identified as the seventh feature.

The author of statement (XIII), which exemplifies this feature, says that he finds himself in "timelessness." He "clearly" remembers using tools effectively to fill his time with activity, but now all movement around him has ceased, and he himself remains in a state of inertia. He experiences a strong tension between what was and what is happening to him/within him now, expressing it in words that in the past he was able to control the flow of time "to a degree that is completely unimaginable to him today." He experiences being taken out of the stream of time, thrown out of the temporal frame of reference in which he previously existed. He feels like a pond cut off from other watercourses, motionless and "overgrown with duckweed." In this respect, there is a difference between the findings of Hicks *et al.* (2025) and the testimonies of my respondents. Hicks *et al.* encourage information science to focus its research interest on decelerations (temporary slowdowns) and interruptions in behaviours that fulfil information needs, as well as how users coordinate these temporary pauses with activities carried out at a normal pace (Hicks *et al.*, 2025, p. 341). They therefore assume that avoidance behaviors in the sense of "traditional," referred to in the literature with a whole range of meaningful names (e.g., blocking certainty, concealing, forgetting, inattention, self-handicapping), are incidental in nature and constitute a pause in the temporality determined, as a rule, by the pro-informative activity of the subject (pro-informative in the sense of being subordinated to the goal of obtaining information, as opposed to non-informative behaviors). This description does not correspond to the accounts of my respondents, as the temporality determined by pro-informative activities ceased to be the main way of anchoring themselves in time and was replaced by its opposite. According to Hicks *et al.* (2025), the subject appears to be a doppelganger of Brenda Dervin's phenomenological human, who "moves from the past, through the present, towards the future." The "body-mind-heart-spirit" of the authors of the narratives I cite is trapped in the bubble of the present, in a space-time gap over which it cannot build a meaningful bridge. Moreover, unlike Dervin's subject figure, in their mental wanderings, they can transcend themselves, but only in one direction: backwards, to memories of times past (Cisek, 2008, p. 97; Dervin, 1999, pp. 729–730; Naumer, Fisher & Dervin, 2008).

The eighth feature, which is an inevitable correlate of all the previous ones, is described by the respondent in statement (XIV) as a loss of information security, which, following Anna Pieczka and Paulina Motylińska, I define as "a state in which the user of information does not feel threatened by: a) contact with low-quality information and b) the loss of all or part of the accumulated information resources," but, on the contrary, is accompanied by "the conviction that they possess the resources (including, for example, knowledge and skills related to the assessment of information quality) necessary to take appropriate action in the face of a crisis situation" (Pieczka & Motylińska, 2021, p. 34). In addition to the rather dramatic picture of "the most real panic" contained in statement (XIV), the loss of a sense of information security can also be read from fragment (V), in which the respondent signals symptoms of persecutory thinking, saying: "I didn't have this fear at all before, I mean*, oh my God, what will be in this package again, what misfortune will happen again*." Panic and misfortune reflect the experience of a looming threat.

4. New conceptualisation

In my reasoning so far, I have gone through two stages. In the first stage, I broke down the concept of "information abnegation" into its components. I concluded that I had to reject it, because the meaning of the word "abnegation" also includes "mortification" and "renunciation" in an eschatological sense. This meaning does not fit the information behaviours of the subjects that "information abnegation" would describe. Moreover, the aspect of mortification dominates in English uses of *abnegation*, so attempting to promote the translation of information abnegation in scientific communication would be confusing. In the second stage, based on an analysis of the characteristics of "information abnegation" identified in the research material, I determined that this term is included in the concept of information avoidance according to Hicks *et al.* (2025), with the difference that they call this form "information avoidance," which results from an unfavorable change in the way the subject experiences information and is always located on the dark edge of the continuum created by information avoidance behaviours. This leaves the third stage, which is the most important for my objective, i.e., finding a name (French: *signifiant*) for this phenomenon that would allow for its easy operationalisation, primarily in practical terms (although research operationalisation is not excluded).

As I mentioned in the introduction, my current reflections are the result of many years of collecting empirical data, which proves that there is a group of people affected by the described form of information avoidance and in vital (in the literal sense) need of help in getting out of the impasse caused by it. The answer to this need is a professional, responsible information service, inherently complex and delivered over a long period, designed for people struggling with this condition.

Contrary to the appeals of Hicks *et al. (*2025) not to label avoidance behaviours as pathological,[2] I deliberately use the word "malady" because that is how all respondents described it, in terms of a debilitating condition. To create a mature prototype of the service, a concise name for its subject must be found. I believe sticking with the phrase "information avoidance" is not the best choice for two reasons. The first reason is marketing-related and concerns the catchiness of the service name. It should be understandable and attractive to the target audience, which, in my opinion, means it should promise to address all the problems the customer cannot handle on their own. I emphasise: all, because by its very nature (a shift in the existing paradigm of experiencing information), this condition is all-encompassing, permeates all areas of the subject's functioning, and cannot be segmented into parts that could be repaired separately. Therefore, it is significant that none of the respondents spontaneously described their behaviour as "information avoidance." The qualifiers they used went far beyond the sphere of behaviour itself and, in my interpretation, defined a new, unwanted modus of experiencing contact with information, which, yes, sometimes manifested itself as actively running away from it, but at the deepest level was always described as a state in which it is not me who avoids information. However, information that eludes me, becomes elusive, or I stop noticing it altogether. In my opinion, naming the subject of the service, e.g., "help in overcoming information avoidance," would be justified if the recipients who need it, or at least a significant part of them, described it that way themselves. The second reason, theoretical, refers to the message contained in the article by Hicks *et al.* (2025), with which I agree. The authors have tried to systematise information science knowledge about information avoidance, aiming to remove this concept from the narrow associations to which it has been confined until now. In my opinion, labelling a service that users experience only in its negative form as "information avoidance" would contradict the intention of Hicks *et al.* and, therefore, be unacceptable to me, as I wish to follow the path laid out by these authors in all my activities related to information avoidance.

Although both of these reasons are, of course, debatable, I conclude that I need to find another name for the proposed service. In case both of the previous arguments fail in a possible debate, I justify the need to find a new *signifiant* with reasons taken from Hicks *et al.* (2025), and I am all the more willing to do so because it was these reasons that convinced me to work on this text. In the summary of their article on information avoidance, the authors write that:

[2] "Previous literature has often sidelined the concept of information avoidance, treating it as a uniquely negative or undesired activity. Research has also tended to treat information avoidance as a monolithic concept, ignoring the growing number of terms that have been used to describe nuances related to a lack of engagement with information. We should give legitimacy to information avoidance as a meaningful information activity which gives shape to a rich set of information practices." (Hicks *et al.,* 2025, p. 342).

(1) Their analysis demonstrates an urgent need for further research to complete the conceptualisation of the concept of information avoidance and to supplement the characteristics of corresponding behaviours, among other things, to understand its connections with other theoretical constructs better.
(2) This research should also aim to reveal the underpinnings of information avoidance,
(3) The a priori assumption of the rationality of human action and the inherent primacy of the will to obtain information over the lack of such a will has meant that a social perspective is not often adopted in research on information avoidance.
(4) Meanwhile, a shift towards research embedded in a social context is advisable, as it would allow for the detection and description of situations in which an individual's access to personal resources such as commitment, agency, and control is rationed by social norms and various power structures, including symbolic power.
(5) In this spirit, every new study on information avoidance that breaks with convention contributes to the cognitive and social legitimisation of the subject's right to non-informational behaviour. It thus counters the authority of the belief that it is only right when the subject wishes to reduce uncertainty by obtaining information and takes appropriate action (*information solutionism*).
(6) It is helpful to use qualitative research methods instead of the quantitative methods that have prevailed so far, which obscure the processual nature of information avoidance by selectively recording data at point *N* on the timeline and ignoring its affective-emotional, communicative, and interpersonal dimensions.
(7) In the qualitative research paradigm, the relatively rarely used interview technique deserves attention, as it can reveal characteristics of information avoidance behaviours that are hidden, for example, due to social stigma, and also accurately map their determinants related to the subject's living environment and biography (Hicks *et al.*, 2025, pp. 341–342).

In light of the above, I believe that adopting a separate name for the behaviours of the participants in my study is not a mistake, primarily since it is intended to serve the practical operationalisation of the research results, i.e., their translation into a specific application (information service) that is in the individual and social interest. However, an equally important issue remains to be resolved, namely that of terminological responsibility and the assessment of the risk of violating, as a result of unnecessary word formation, the principle of economy of thought known as Ockham's razor ("do not multiply entities unnecessarily"), according to which "When explaining phenomena, one should strive for simplicity, 'choosing a path' that involves as few preliminary assumptions and concepts as possible" (Parysek,

2017, p. 178). I assessed this risk by subjecting my idea for the name of the service to a test for redundancy, flawed metaphorisation, mannerism, and semantic obscurity according to the criteria described by Jerzy J. Parysek (2017). The result was successful, mainly because the term already exists, albeit not commonly, in the language of information science. Namely, it is information apathy (information fatigue), a term used in the context of information ecology, and especially information diseases, by Wiesław Babik (2014), who indirectly guides us to their understanding, pointing out that:

> Knowledge that is incorrectly absorbed—in proportions that deviate from the norm—causes people to become lost in the world of information. They are unable to find true and valuable values, struggle to distinguish truth from falsehood, have a shaken hierarchy of values, are emotionally unstable, and are even overcome by information apathy (weariness) (Babik, 2014, p. 48).

Wiesław Babik does not list the attributes of information apathy, nor does he prejudge whether it is a set of information behaviours or a cognitive-emotional state that manifests in specific behaviour. However, he clearly links them to the consequences of an unbalanced information diet and the subject's axiological chaos. A similar interpretation is also proposed by Augustyn Bańka, who refers to the psychological syndrome of doing nothing, apathy, or lethargy as defensive behaviours harmful to the subject, developed in the cycle of adapting identity to the discontinuity of meanings and values that characterise the contemporary infosphere of the knowledge society[3] (Bańka, 2011; 2016, pp. 114–115). The loosely defined framework of this term makes it flexible and adaptable, making it suitable for my purposes. Like the hypernym "information diseases" and all its other hyponyms, information apathy is a metaphor. It will remain so until an official decision is made to include it in medical nomenclature. The use of scientific metaphors requires caution because, as Jerzy J. Parysek warns, it is easy to fall into exaggeration, semantic contortions, and a penchant for unnecessary synonyms through numerous examples. This risk occurs when: 1) the boundary conditions of metaphorization in the cognitive sense are not met, i.e., in order to convey the content of a (new) experience, it is not necessary to capture it "in terms used to describe other types of experience" (Zeidler, 2014, p. 240) and 2) there is a large gap between the source domain, from which the metaphorical medium originates, and the target domain to which it is transferred. In Table 3, I compare the distance between the source and target domains for three metaphors: information apathy and two metaphors criticised by Jerzy J. Parysk as unnecessary, which are used, among others, in the social and economic sciences. I should mention that I have excluded philosophy from this comparison, as it would mean analysing at least

[3] "People experiencing the pace of change in the information age in the form of a sense of loss of meaning and value in life are overwhelmed by a feeling of emptiness, have a reduced awareness of the goals of their actions, show deficits in emotional responses, and are dominated by apathy and lethargy in their everyday experiences" (Bańka, 2016, p. 115, after: Baumeister *et al.,* 2004).

one metaphor that is doomed to failure, internally contradictory, resulting from the clash of my conceptualisation of apathy with the Stoic doctrine of *eupatheia,* i.e., the noble restraint of irrational passions (Miech, 2009, pp. 138, 139, 1414). The source and target domains are indicated (in square brackets) by the scientific disciplines in which these domains are embedded.

Table 3. The gap between the semantics of origin and the target semantics of sample scientific metaphors

Source Domain	Explanation	Target Domain
„Locomotive" [Mechanics]	„A mechanical vehicle designed to pull carriages along a prepared track"	„Engine of development" [Economics]
„Generator" [Mechanics]	„A device (machine) for producing something (electricity, vibrations, electric field, magnetic field, electromagnetic field, sound, etc.)"	„Generator of development" [Economics]
Apathy [Ethology]	„A reaction to chronic lack of predictability and control over aversive environmental stimuli. A type of strategy for coping with the environment, consisting of "saving" energy and "waiting out" an unfavourable period of decreased predictability and control over environmental factors" (Jezierski, 1996, p. 585)	Information apathy [Information science]
Apathy [Psychology]	"In the psychology of doing nothing, negative doing nothing is distinguished as a state of apathy and an activity aimed at *killing* time" (Bańka, 2016, p. 115) "One of the self-regulatory mechanisms triggered in a situation where inappropriate choices threaten identity is *indecisiveness* (Spunt, Rassin & Epstein, 2009)." „This is the simplest possible mechanism for coping with the real or potential threat of identity discontinuity in ambiguous situations, because it boils down to doing nothing" (Bańka, 2011, p. 130).	Information apathy [Information science]

Source: prepared by the Author based on Parysek (2017, p. 189).

In contrast to metaphors moving from mechanics to economics, the distance separating apathy in ethology and psychology from information apathy is short. Essentially, semantic transfer occurs not so much between separate domains, but rather between subsets of the same parent domain, according to the following scheme: animal behaviour, including human behaviour (ethology) = human behaviour (psychology) = human information behaviour. In this state of affairs, I consider the risk of semantic abuse to be negligible. In the cited definitions of apathy in the source domains, the implicitness of the attributes defining it is striking,

as if the concept were considered universally understandable and requiring no further elaboration. This observation is confirmed by the results of queries in the POLIQARP, MTAS, and PELCRA search engines, in which definitional explanations never accompany apathy. Its meaning is specified at most by collocations, e.g. (a. = apathy): "sluggishness and a.", "a. and powerlessness," "a., taciturnity, and seriousness," "a., complete insensitivity to stimuli," "a., numbness, general aversion," "disillusionment, a., fatalism," "emptiness, lifelessness, and a.," "a. and discouragement," "indifference and a.," "passivity, a. and indifference." In my opinion, the content of its entry in the *Walenty* dictionary, where 7 out of 8 identified valence patterns, i.e., the acceptable combinability of this noun with other parts of speech, are described as questionable (*Walenty,* 2025), also speaks in favour of the overly intuitive use of the lexeme apathy. The entry in the *Słowosieć* dictionary provides both a definition and a list of synonyms for apathy: "passive submission to something, lack of will or strength to act," inertia, insensitivity, numbness, gloominess, dullness, inertia, lifelessness, numbness, lethargy, stagnation, dullness, numbness, as well as so-called emotional annotations, describing apathy as strongly negative, the emotion associated with it as sadness, and its evaluation as harm, uselessness (*Słowosieć,* 2025), but such a vaguely defined concept still does not meet my needs.

Therefore, to fill in the gaps, I will add a compilation of characteristics from scientific sources to the defining elements already highlighted in Table 3. These characteristics associate apathy with indicators of avoidance behaviours described earlier in the commentary on my respondents' narratives (characteristics 1–8 above). Combinatorial searches on Google Scholar, Semantic Scholar, PubMed, and the Embase and EBSCO Information Services databases (a combined interface for 33 databases) showed that apathy is most often associated with anhedonia, as noted in medical literature on psychopathology and psychological literature. From these subject areas, I will therefore import content that completes the definition of apathy, specifying that it is a transdiagnostic (accompanying many different disorders of human well-being) phenotype of weakened motivation in five areas: 1) self-care, 2) exploration, 3) social interaction, 4) work or study, and 5) all forms of entertainment and recreation, which lead to a disturbance of the subject's mental balance in the emotional, cognitive, and behavioural dimensions, and consequently to functional dysfunctions in everyday life (Batail *et al.,* 2018). I want to point out that Hicks *et al. (*2025) pave the way for such an understanding of certain forms of information avoidance, referring to Savolainen's (1995) typology *of* mastery of life, according to which particular styles of agency correlate with information avoidance (p. 332), and to the concept of Barbour *et al. (*2012) linking information avoidance with apathy and weariness (p. 336).

4.1. Definition of information apathy

Based on the above, I adopt the following definition of information apathy: a set of maladaptive behaviours developed in response to a change (discontinuation) in how an individual experiences information. It includes multiple forms of information avoidance, the common denominator of which is the paralysis of the main areas of motivation and, as a result, the dysfunction in the subject's everyday life associated with fatalistic resignation, anhedonia, indecisiveness and inactivity, a decrease in sensitivity to the informational affordances of the environment, a specific experience of temporality, a decrease in the sense of informational security, and prolonged suffering.

5. Operationalisation of the concept

According to the *Encyklopedia Zarządzania*, I understand operationalisation as "the process of defining an object (phenomenon) that cannot be described (measured) in an unambiguous way, even though other phenomena indicate its existence. (...) It enables the specification of what is and what is not a given object by determining actions that make the object's characteristics measurable. (...) The process of operationalisation is necessary to concretise the description of the research or design subject, as it enables decisions about the practical application of a given definition. The result is a clear and concrete definition of the project, specified in terms of the interpretation of the project topic and the subject and functional scope of the project" (Gregorczyk, n.d.). In the preceding parts of the text, I addressed operationalisation in conceptual terms, and now I present the practical applications of the constructed definition.

As a maladaptive behaviour and therefore contrary to the well-being of the individual, information apathy justifies the development of countermeasures to mitigate its adverse effects and, to the greatest extent possible, restore regressed information behaviours. The methodological and praxeological resources available to information science justify an attempt to create a service that supports people with information apathy and even ethically urges such a service to do so. At the same time, the limits of this subdiscipline's competence prevent it from addressing the circumstances of the crisis as they are experienced, which is the root cause of apathy. The proposed service can therefore consist solely of replacing the recipient in information activities currently beyond their reach, while simultaneously searching for compensatory patterns of information behaviour that could gradually bring them out of their inertia. The aim of such functional rehabilitation or information revalidation would be to gradually improve the recipient so that they feel ready to cross the threshold of hope again, or, as Augustyn Bańka writes, regaining agency and, consequently, the belief that their destroyed information space can be put

back in order, even though the order will not necessarily be the same as before. The stakes would be at least a partial departure from inaction as a strategy for coping with the dark triad of the information society: discontinuity, unpredictability, and instability (Bańka, 2016, pp. 114, 116, 118) or, as some information scientists note, the VUCA world dominated by volatility, uncertainty, complexity, and ambiguity (cf. Dugoin-Clément, 2024; Fuentealba *et al.*, 2023; Jaskowska, 2020).

During the academic years 2019/20–2024/25, together with students of information management at the Institute of Information Studies (ISI) of the Jagiellonian University, we created prototypes of such an innovative service as part of optional coursework, bringing one of them to a high level of implementation maturity. The first and oldest project, called "Tutoring program for people with information abnegation" (because we still used the word abnegation at the time), was presented to the public during the third edition of the nationwide scientific and implementation symposium "Faces of Transfer" organized at the ISI JU in May 2021 (*Faces of Transfer...*, 2021), and then, within a month of the presentation, tested on me as part of my student internship. The incentive for this immediate verification was the positive opinion on the service's usefulness expressed by Dr Paulina Łopatniuk, a well-known populariser of medical knowledge, who participated in the symposium as a subject-matter expert. In subsequent years, five more prototypes were created. Although none of them entered the testing phase, the work on them proved necessary and practical, as it allowed us to repeatedly practice creating innovations in accordance with the design thinking methodology, as well as to improve the quality of the diagnostic tools we used to estimate the extent of information apathy (Rak, 2022; 2023).

During subsequent iterations, we also became increasingly aware of the awkwardness of the term "information abnegation" and considered possible replacements for it during discussions, the echoes of which are contained in this text. In the first semester of the current academic year, third-year students of the first-cycle degree program in information management created a final prototype, which reached level 5 on the 9-point Technology Readiness Levels *(TRL)* scale and is being prepared for a jump to level 6. Level 5 involves the technological validation of the developed prototype in an environment close to real life, while level 6 involves presenting it in real-life conditions (Rębosz-Kurdek & Masternak-Janus, 2018; Kaczmarska, Bochnia & Gierulski, 2015, p. 108).

In May 2025, an interdisciplinary consultation on the prototype was held at the Faculty of Management and Social Communication of the Jagiellonian University. This event concluded the validation stage and simultaneously served to plan and implement the subsequent stages. The authors of the prototype "Support services for people with information apathy" are preparing a description of its characteristics in the form of a scientific article, which will be published in the next volume of the ISI Jagiellonian University publishing series *Horyzonty Informacji* [Information Horizons].

6. Conclusion

Information apathy is a complex of information behaviours characterised by a specific, unwanted way of experiencing information. In the reported study, all respondents developed apathy due to an ecosystem shock that deprived them of access to important information resources, leading to a sense of loss or deprivation. However, this does not mean that the discontinuation of a way of life rooted in information, which is the source of apathy, must always occur as a violent turning point that the subject consciously describes as a crisis. The causes and triggering events can vary, being overt or latent, and in any case, not necessarily transparent to the information user. I am pointing this out for clarity because, within the framework of the proposed service supporting people with information apathy, the information professional is not competent to investigate its underlying causes and generally does not address this issue. They do not enter areas reserved for specialists in other fields, such as doctors, psychologists, psychotherapists, or counsellors, unless the client requests it or the specialist approves it. The proposed service can be provided on the free market and potentially in libraries and centres offering various forms of practical support for people with a reduced sense of agency.

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Projekt usługi informacyjnej dotyczącej unikania informacji

Abstrakt

Cel/Teza: Na podstawie wyników pięcioletnich badań prowadzonych w Polsce stwierdzono istnienie odbiorców poszukujących profesjonalnej usługi informacyjnej, która polegałaby na świadczeniu praktycznego wsparcia w odzyskiwaniu zachowań informacyjnych wypartych i zastąpionych przez szczególną odmianę unikania informacji. W artykule podjęto cel zoperacjonalizowania tych ustaleń badawczych przez delimitację zakresu treściowego terminu, który ma stanowić przedmiot projektowanej usługi informacyjnej.
Metody badań: Wykorzystano metody analizy i krytyki piśmiennictwa, analizy semantycznej oraz cyklicznie wdrażany kompleks metod badawczych i dydaktycznych obejmujący autoetnografię, badanie dokumentów zastanych, refleksywną analizę tematyczną, metodę symulacyjną, *design thinking*, metodę projektową oraz *phenomenon-based learning*, a także technikę person. Materiał empiryczny zbierano techniką wywiadu pogłębionego i wywiadu fokusowego. W procesie badawczo-rozwojowym stosowano również technikę oceny prototypu według 9-stopniowej skali Poziomów Gotowości Technologicznej (TRL).
Wyniki i wnioski: Istnieją użytkownicy, którzy z rozmaitych przyczyn pozostających poza obszarem rozpoznań badawczych informatologii doznają głębokiej zmiany sposobu doświadczania informacji, której skutki odbierają jako niekorzystne i szukają na nie remedium. Aby możliwe było zaprojektowanie specjalistycznej usługi informacyjnej przeznaczonej dla tych odbiorców, konieczne jest scharakteryzowanie ich kondycji w języku zachowań informacyjnych.
Ograniczenia badań: Przedstawiono konceptualizację terminu mającego nazywać przedmiot projektowanej usługi informacyjnej. Postępowanie to podlega zwyczajowym regułom falsyfikacji. Innych szczególnych ograniczeń nie stwierdzono.
Zastosowania praktyczne: Doprowadzenie prototypu usługi informacyjnej do maksymalnie wysokiego poziomu w skali oceny gotowości technologicznej TRL.
Oryginalność/wartość poznawcza: Badania wnoszą nowe elementy do stanu badań nad doświadczeniem informacji i typologią zachowań realizujących wzorzec unikania informacji. Są również punktem wyjścia dla wdrożenia innowacyjnej, nieobecnej dotychczas na rynku usługi informacyjnej.

Słowa kluczowe

Abnegacja informacyjna. Apatia informacyjna. Profesjonaliści informacji. Unikanie informacji. Usługi informacyjne.

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Quantitative analysis of datasets and their usage patterns in language models

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Abstract

Purpose/Thesis: The objective of this analysis was to provide a quantitative characterisation of the datasets used for training language models. Specifically, the study encompassed: 1) an analysis of the frequency of use of individual datasets and the patterns of their usage across different types of models; 2) an assessment of the diversity of data employed by model developers; and 3) an examination of the variety in dataset usage in relation to specific applications of language models.

Approach/Methods: The metadata of language models available in the Hugging Face repository was analysed. Only models that included information about the name of the dataset used – understood as a collection used for training, fine-tuning, or evaluating a language model – were considered. In total, 56,762 models (13.8% of all retrieved) were analysed, with metadata collected on March 6, 2025, using the huggingface-hub library. The analysis included, among others, the number of models and their authors, the frequency of dataset use depending on model category, and the correlation between the number of unique datasets used by each author and the total number of models they released. The analysis was conducted in Python using the pandas, matplotlib, seaborn, and scipy.

Results and Conclusions: A total of 13,376 datasets were identified. Most models were trained using only a single dataset. A tendency toward greater dataset diversity was observed among authors who released a larger number of language models. It was also observed that categories with fewer models exhibited greater diversity in the datasets used for training.

Originality/Value: The analysis reveals specific patterns concerning the degree of diversity in dataset usage, depending on the author and the category of the language model.

Keywords:

Artificial intelligence. Dataset. Hugging Face. Language model.

Text received on the 22nd of April 2025.

ZIN 2025, *63*(1A), 88–109
DOI: 10.36702/zin2025.01.05e

1. Introduction

Over the last few years, the field of artificial intelligence has seen growing interest in language models, that is, statistical models capable of predicting words in natural language sequences. Those trained on large datasets of various types of data are referred to as large language models (Auffarth, 2024). Their popularity can be illustrated by the number of downloads from the Hugging Face (HF) repository (*Models – Hugging Face*, 2025). For example, sentence-transformers/all-MiniLM-L6-v2 and google-bert/bert-base-uncased have been downloaded over 80 million times (as of March 6, 2025).

In the HF repository, all models performing specific natural language tasks have been divided into 12 categories (as of March 6, 2025). The most numerous groups are text generation and text2text generation, which are trained to generate new words or sequences of words based on the input text (*What is Text Generation?*, 2024). The second-largest group consists of models trained for text and token classifications. The former are used in sentiment analysis tasks, whereas the latter are effective, among other things, in operations related to entity or part-of-speech recognition (*What is Text Classification?*, 2023; *What is Token Classification?*, 2024). The zero-shot classification category, which contains models that classify previously unseen data, is the least numerous (*What is Zero-Shot Classification?*, 2023).

More than 10,000 models have been registered in categories such as feature extraction, fill-mask, and question answering. In the case of feature extraction, a model transforms the input text into its numerical representation, which is used for functions such as a semantic search or text comparison (*Feature Extraction with LLMs, Hugging Face and MinIO*, n.d.; *What is Feature Extraction?*, 2024), while models of the fill-mask type predict missing words in a text by replacing masked parts with appropriate words (*What is Fill-Mask?*, 2025).

Information retrieval systems employ question-answering models that respond to natural-language queries by extracting relevant information from the provided data (*What is Question Answering?*, 2025). These systems also use models from the sentence-similarity category to evaluate semantic similarity between texts (*What is Sentence Similarity?*, 2025). A different function is performed by table question answering models, designed to respond to queries based on tabular data (*What is Table Question Answering?*, 2023). A relatively small group consists of models designed for automatic translation and text summarisation.

In practice, some models are universal in nature and can perform a variety of tasks in the field of natural language processing (translation, summarisation, sentiment analysis) (Arif, 2023).

Language model training is usually conducted in two stages. First, a model is trained on an extensive set of texts. Subsequently, it is refined using the

Reinforcement Learning from Human Feedback (RLHF) algorithm, also known as human feedback reinforcement learning, to generate responses that meet the evaluators' requirements (OpenAI *et al.*, 2024). These stages also set specific criteria for categorising datasets used to train models.

Zhao *et al.* (2025) distinguish three main categories of datasets. The first one consists of data used for preliminary model training. These corpora can come from single or multiple sources, such as Wikipedia (n.d.) and arXiv (*arXiv.org e-Print archive*, n.d.). The Colossal Clean Crawled Corpus (C4) (Dodge *et al.*, 2021) is based on the Common Crawl database, which archives website content (*Common Crawl – Open Repository of Web Crawl Data*, n.d.). Language models which aid computer code writing use publicly available resources from services such as GitHub (*GitHub· Build and ship software on a single, collaborative platform*, n.d.).

The second category listed by Zhao *et al.* (2025) consists of datasets used to fine-tune a model, intended to improve its capabilities and adapt it to specific applications. Samsum (*Samsung/samsum · Datasets at Hugging Face*, 2022; Eigenbrode *et al.*, 2024), a dataset with over 16,000 examples of everyday conversations transcribed by linguists along with their summaries, is used to train models in dialogue summarisation. A distinctive group of datasets consists of synthetic data. According to Jordon *et al.* (2022), it is "data that has been generated using a purpose-built mathematical model or algorithm, with the aim of solving a (set of) data science task(s)." Alpaca is an example of this type of data generated by the model text-davinci-003 (*tatsu-lab/alpaca · Datasets at Hugging Face*, 2024).

The third group, distinguished by Zhao *et al.* (2025), includes datasets whose task is to fine-tune the language model so that it does not generate information that is unhelpful, harmful, or misleading (Eigenbrode *et al.*, 2024). For instance, PKU-SafeRLHF (*PKU-Alignment/PKU-SafeRLHF · Datasets at Hugging Face*, 2024) contains over 80,000 entries, each including a question, two answers, and an assessment of their harmfulness and helpfulness. H4 Stack Exchange Preferences (*HuggingFaceH4/stack-exchange-preferences · Datasets at Hugging Face*, n.d.) is more specialised, comprising nearly 11 million questions and answers, which are annotated as to their helpfulness, downloaded from the Stack Overflow service (*Newest Questions*, n.d.).

A similar classification has been proposed by Liu *et al.* (2024). However, they also included datasets used to evaluate models and those specifically designed to train, optimise, and test traditional language models, which might be useful for information extraction, classification, and text summarisation. For evaluation purposes, FACTSCORE (Min *et al.*, 2023) is used to assess the factual accuracy of statements generated by language models. To perform other tasks, datasets such as the Question Answering Dataset (SQuAD) (*Re: Stanford Question Answering Dataset*, n.d.) and Natural Questions (google-research-datasets/*natural-questions*, 2019/2025) are employed.

Researchers also categorise datasets according to the type of question they enter into the system. Some datasets cover factual questions (e.g., Who discovered...?), non-factual ones (e.g., Why does a language model hallucinate?), and yes/no questions (Baradaran *et al.*, 2022). The previously mentioned SQuAD (*The Stanford Question Answering Dataset*, n.d.) is an example of a factual question dataset, consisting of a set of questions and answers derived from Wikipedia articles. WikiHowQA (Lurunchik/WikiHowNFQA · Datasets at Hugging Face, n.d.) is an example of a non-factual question dataset containing nearly 12,000 questions and answers based on close to 75,000 documents.

Another criterion of classification may be the type of response generated by the model. Baradaran *et al.* (2022) distinguish two types of datasets: generative and extractive. In a generative model, the system independently generates a response based on the provided context. An example of this type of dataset is DuoRC (DuoRC, n.d.), which contains nearly 187,000 question-and-answer pairs on film plots, compiled from Wikipedia and the IMDb database. An extractive model provides an answer which is a fragment of text retrieved from the context. An example of a larger dataset of this type is TriviaQA (TriviaQA, n.d.), which consists of over 650,000 question-and-answer pairs supported by source materials.

Datasets can also be categorised according to how they are created. Baradaran *et al.* (2022) distinguish between datasets which are automatically generated, human-generated, and hybrid. SQuAD, a set containing over 100,000 questions and answers, is an example of a human-generated, crowdsourced dataset. In contrast, the hybrid approach is represented by the Natural Questions dataset, which contains genuine questions entered by users into the Google search engine and answers extracted from Wikipedia (*google-research-datasets/natural-questions*, 2019/2025). In the context of data collection and processing methods for training language models, Goetz and Abramson's (2021) concerns are worth noting, as they highlight issues such as inadequate protection of the labour rights of individuals employed to perform these tasks.

In turn, the classification proposed by Rogers *et al.* (2023) is based on key skill requirements for solving question-answering and reading comprehension tasks, such as reasoning, information searching, and reality modelling.

The quantitative analysis presented in this article aligns with the growing body of research on data corpora used for training language models, as their content and contemporaneity can significantly affect the quality of the generated responses (Rejeleene *et al.*, 2024). The objective of the analysis is to examine the frequency of use of individual datasets and their usage patterns across different types of models. Its results may aid in choosing datasets to train language models. They may also be an element of the properties of the models themselves, demonstrating the extent to which new resources are used or the frequency of reuse of the same datasets.

2. State of research

Researchers have often analysed datasets used to train language models. Dzendzik *et al.* (2021) conducted an extensive exposition of 60 English-language datasets, where the presence of Wikipedia in over 38% of them prompted the authors to recommend excluding this source from being used in future corpora. They also noted that over 60% of datasets were created with the assistance of crowd workers who were linguistically fluent but lacked expertise in the respective field.

Zeng *et al.* (2020), who analysed 57 datasets, also highlighted the implications of Wikipedia as a source of training data and the fact that almost 64% of datasets were developed using crowdsourcing.

Baradaran *et al.* (2022) conducted a review of research articles on artificial intelligence, analysing texts from 2016 to 2020 and identifying 53 datasets. Only 10 of them had a closed character set, limited to a specific domain, while the majority of the datasets contained exclusively English-language data.

Yu *et al.* (2022) examined 156 multilingual open-access datasets, where they identified the presence of 222 languages. In only 18% of cases was there intentionally prepared input text. In the remaining cases, the source materials were press releases, Wikipedia sources, and various web resources. They also noted that most of the datasets pertained to text classification tasks.

Systematic analyses of datasets have been conducted by researchers from the Data Provenance Initiative (DPI) (Data Provenance Initiative, n.d.). In a comprehensive study covering over 1,800 text datasets, Longpre *et al.* (2024) highlighted a data transparency crisis driven by inadequate documentation of data sources. This hinders understanding of the specifics of the data used to train language models.

In a subsequent study, Longpre *et al.* (2025) analysed 3,916 datasets consisting of text, speech, and video data. They noted that these data are increasingly sourced from the internet or synthetically generated, while manual collection is becoming less common. They highlighted that many datasets lacked a clearly defined license.

Paullada *et al.* (2021) summarised concerns about data quality, including the underrepresentation of certain sociodemographic groups in datasets and biased data labelling. There are also controversies arising from practices of collecting and processing data from search engines and social media that infringe on users' privacy.

Issues with data quality have been highlighted by such researchers as Kreutzer *et al.* (2022), who examined five large datasets (CCAligned, ParaCrawl, WikiMatrix, OSCAR, mC4). In 87 out of 205 language corpora included in these sets, less than 50% of the text was useful. Additionally, there was not a single correct sentence in 15 corpora.

Another increasingly important concern is the flooding of the internet with fake content generated by artificial intelligence systems, which contaminates the responses they produce. For example, the NewsGuard journalists have documented

that the ten most powerful chatbots (such as ChatGPT-4o, Copilot, Meta AI, Claude, Gemini) replicated Russian propaganda narratives published by a network of interconnected websites.

The high costs of creating training datasets, confidentiality concerns, and the unavailability of specialised data encourage researchers to use large language models to generate synthetic data (Rossi *et al.*, 2024; Guo & Chen, 2024).

Sun *et al.* (2024) used the text-davinci-003 model developed by OpenAI to generate queries, which served as the basis for training the conversational MOSS model. Tang *et al.* (2023) have demonstrated a relatively high effectiveness of a local language model trained on synthetic data generated by ChatGPT in recognising named entities and relations in medical texts. Askari *et al.* (2023) have also highlighted the considerable potential of generative language models (in this case, ChatGPT) to create training data for the purpose of training neural networks. In contrast, Li *et al.* (2023) demonstrated the varied efficacy of language models trained on GPT-3.5-Turbo data across various text classification tasks.

Synthetic data can also be used to correct undesirable behaviours in large language models. Wei *et al*. (2024) used it to limit situations when a language model adjusts its responses to the user's views. In turn, Hämäläinen *et al.* (2023) used the GPT-3 model to generate user responses on their perceptions of video games as art. They concluded that, given their low cost and high data-generation speed, synthetic data can be useful in the ideation and preliminary experimentation stages.

3. The objective of the analysis

The aim of the analysis is to examine the frequency of use of individual data sets and their usage patterns across different types of language models. The primary part of the study was preceded by a general quantitative characterisation of the models, including the identification of their authors and their assignment to task categories within the field of natural language processing.

The main part of the analysis aimed to answer the following research questions:

RQ1. What datasets were used to train language models, and how frequently?

RQ2. Is there a correlation between the number of unique datasets used by individual authors and the total number of models they have published? The purpose of this question was to evaluate the diversity of data used by model authors.

RQ3. Is there a correlation between datasets and the categories of models which used them? For this purpose, the frequency with which individual datasets were used in the context of different categories of tasks performed by models was examined. The ratio of the number of unique datasets to the number of models assigned to a given category was also analysed. This allowed for the evaluation of the diversity of data sources used in specific applications.

4. Research methodology

The analysis is quantitative in nature and involves statistical processing of metadata of language models available in the HF repository. It includes only the metadata of those models that contained information about the name of the dataset used in the tags field.

In this analysis, a dataset is defined as a collection intended for training, fine-tuning, or evaluating a language model. It may include one or multiple datasets containing various types of information used in the process of training and evaluating the model. The premise was that each data set name appearing in the model description serves as a unique identifier, referring to the specific version of the dataset used to create it. The metadata from language models was retrieved on March 6, 2025, from the huggingface-hub library (version 0.29.3), which is used to search for and manage models in the HF repository.

The process of searching for models and the selection criteria are presented in Figure 1. Only the metadata of language models developed to perform natural language processing tasks was included. The following metadata were used to characterise the resource: modelId (model name), author (model author), pipeline_tag (category of NLP tasks performed by the model), and tags (keywords characterising the model, including the dataset name).

The analysis included 56,762 models (13.8% of the total), providing information about the dataset used.

To evaluate the representativeness of the analysed set (n=56,762), the distribution of model categories (pipeline_tag) was compared with that of the complete set of retrieved models (n=409,662). The chi-square test ($p < 0.0001$) revealed statistically significant differences between the distributions, suggesting the sample is not representative of the population. In particular, an overrepresentation of token-classification (+4.17 percentage points) and question-answering (+2.60) categories was observed, while the text-generation (–6.45) category was underrepresented. This needs to be considered when interpreting the results of this analysis.

As part of the analysis, the following were calculated:

(1) The number of authors of released models and the average number of models per author.
(2) The number of models belonging to each category.
(3) The number of language model categories per author.
(4) The number of datasets used to train language models and the average number of datasets per language model.
(5) The correlation (the Pearson coefficient) between the number of datasets used by individual authors and the total number of language models they published.
(6) The frequency of occurrence of datasets in the specific categories of language models.

(7) The ratio of the number of sets to the total number of models in a given category.
(8) The average number of datasets per model in a given category.

The analysis was performed in Python (version 3.12.7), using the pandas (version 2.2.2), matplotlib (version 3.9.2), seaborn (version 0.13.2) and SciPy (version 1.13.1) libraries.

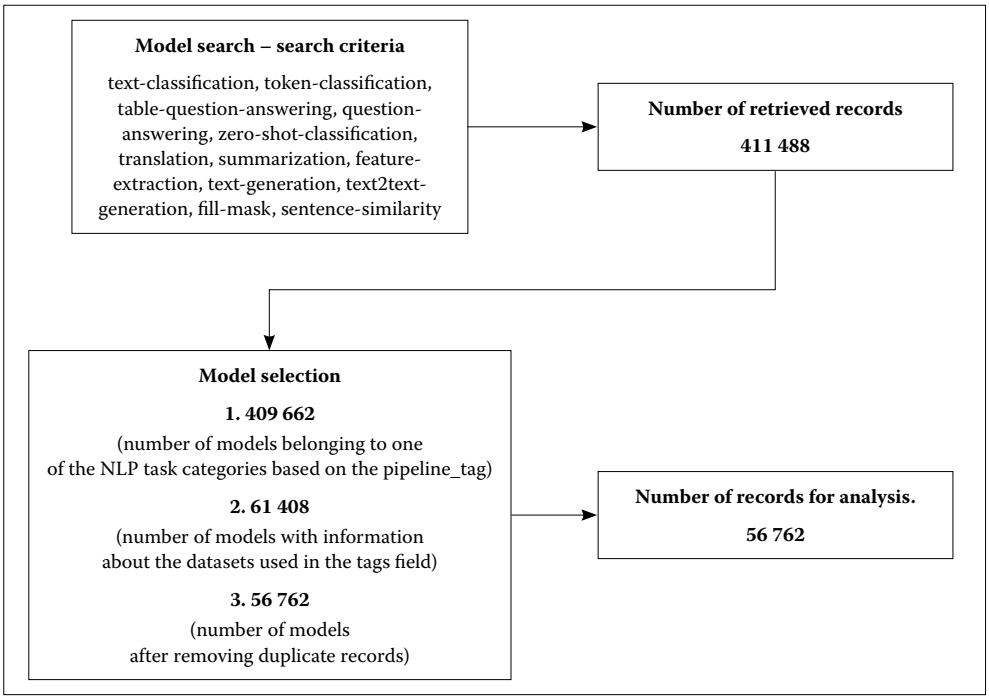

Figure 1. Selection of models in the Hugging Face repository.

Source: prepared by the Author.

5. Results

5.1. General characteristics of language models

A total of 56,762 models were published in the repository by 17,477 entities. Table 1 presents a list of 20 authors with the highest number of shared models. The maximum number of models published by a single entity is 1136, and the average number of models per author is 3,25. Over 65% of all authors published only one model, and 92% published no more than five.

The models developed for text/token classification/text generation accounted for over 80% of all analysed language models (Figure 1). A significant minority (4%) consisted of models developed for translation or summarisation tasks.

Table 1. List of 20 authors with the highest number of shared language models

Name of the author	Number of models	Percentage of total models (n=56,762)
goldfish-models	1136	2.0
gokuls	1003	1.77
LoneStriker	953	1.68
eBloke	849	1.5
research-backup	709	1.25
TransferGraph	597	1.05
fine-tuned	508	0.89
bartowski	507	0.89
gokulsrinivasagan	484	0.85
tensorblock	390	0.69
NasimB	381	0.67
anas-awadalla	373	0.66
ShenaoZ	312	0.55
blockblockblock	308	0.54
fbaldassarri	271	0.48
CharlesLi	269	0.47
google	264	0.47
KoichiYasuoka	264	0.47
MaziyarPanahi	225	0.4
Triangle104	210	0.37
Others	46,749	82.36

Source: prepared by the Author.

Following the exclusion of entities that published only a single model, the largest group of authors (almost 64%) presented in Figure 3 published models that belonged exclusively to a single category. Few authors chose to develop models consisting of three or more categories.

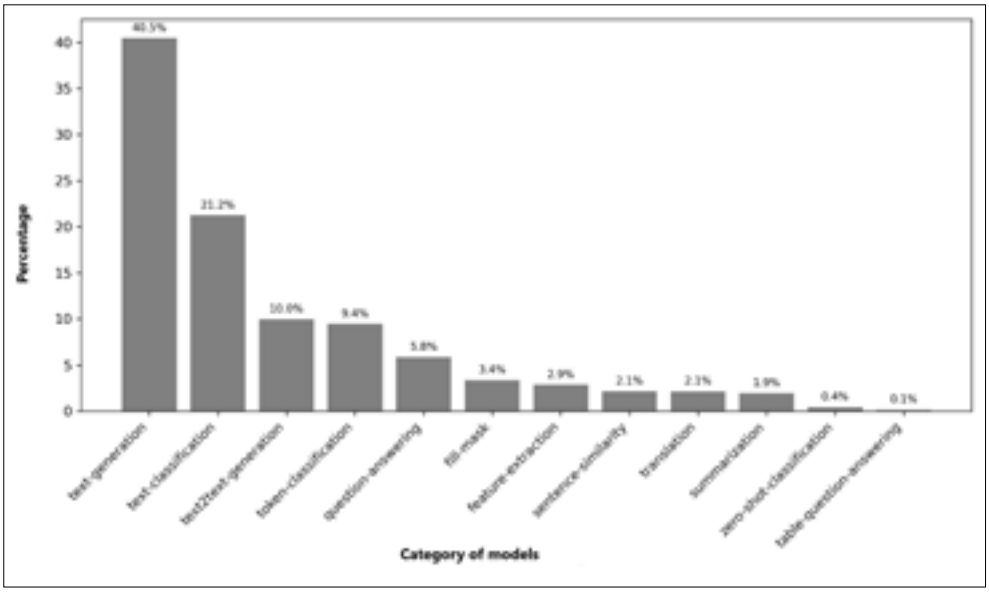

Figure 2. Classification of models into categories

Source: prepared by the Author.

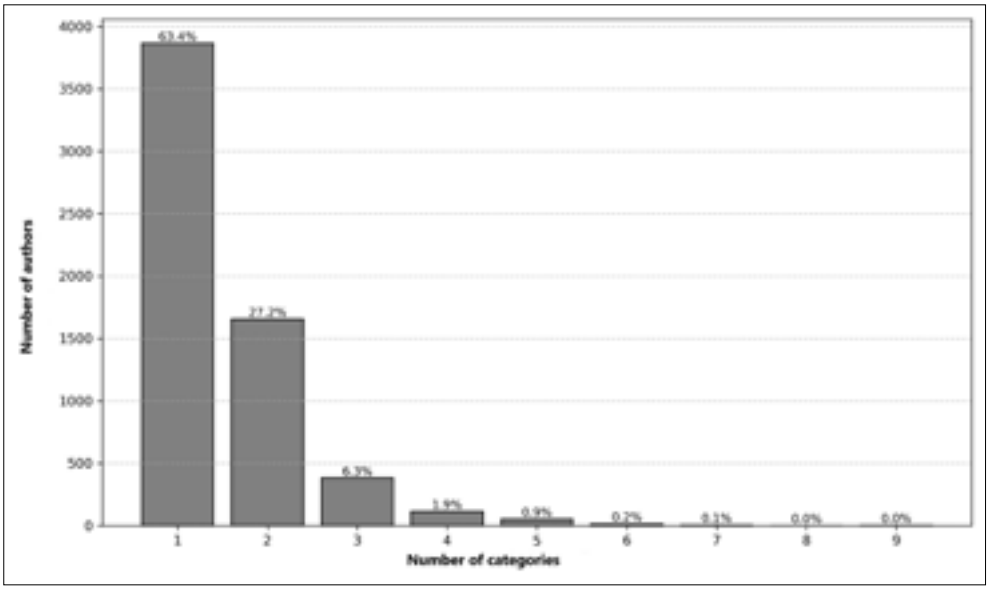

Figure 3. Distribution of authors by the number of language model categories (only authors with ≥2 models)

Source: prepared by the Author.

5.2. Which datasets were used to train language models, and how frequently were they used?

In total, 13,376 unique datasets were identified in the analysed set. Table 2 lists the 20 most used datasets. On average, each model used fewer than two sets (1.74).

Table 2. The 20 most used datasets

Dataset	Number of occurrences
glue**	2458
emotion	1750
squad	1736
imdb	1298
generator*	1233
xtreme	1126
conll2003	1077
wikipedia	866
cis-lmu/Glot500	783
allenai/MADLAD-400	683
allenai/c4	670
tweet_eval	622
samsum	609
allenai/nllb	584
HuggingFaceH4/ultrafeedback_binarized	581
oscar-corpus/OSCAR-2109	574
teknium/OpenHermes-2.5	566
squad_v2	538
kde4	509

* This name was given to a dataset used to train a model, but it does not identify any specific dataset. The model characteristics contain, for example, the description: "this model is a fine-tuned version of ShenaoZhang/0.001_idpo_iter_1 on the updated and the original datasets."

** A set without a slash in the name has not been available in HF. In this case, the authors may have used resources outside of HF.

Source: prepared by the Author.

Over 80% of models (Figure 4) are based on only one dataset. Fewer than 17% used from two to ten datasets. A significantly lower percentage is for models trained on more than ten sets. In the case of six models, over 200 datasets were used. The most sets, that is, 289, were used to train the tasksource/deberta-small-long-nli model (*tasksource/deberta-small-long-nli · Hugging Face*, 2023).

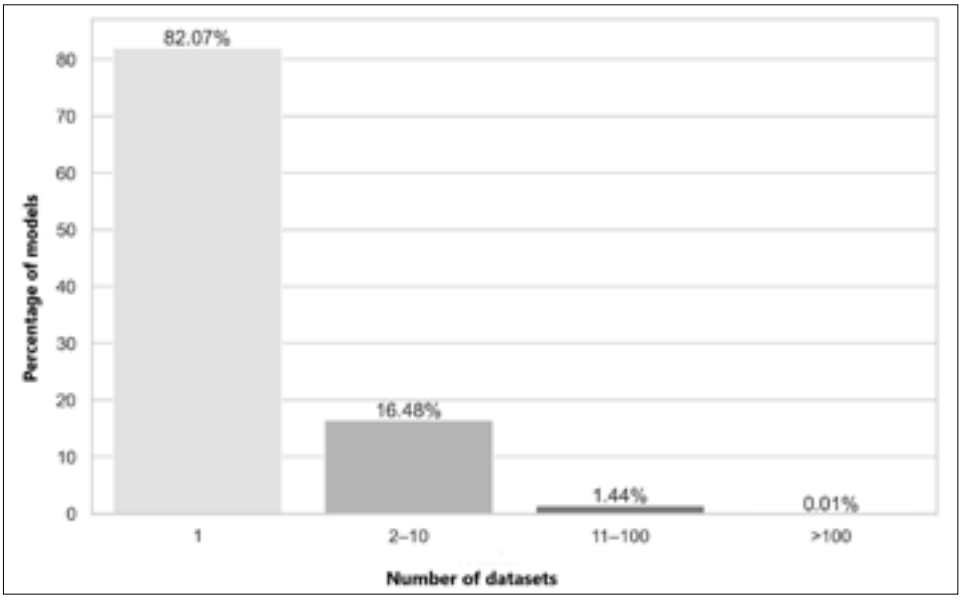

Figure 4. Number of datasets used by language models

Source: prepared by the Author.

Almost 58% of datasets were only used once to train language models (Figure 5). In general, a significant, that is, almost 92%, group consists of datasets that have been used at most 10 times. A small percentage —no more than 1.3% —consists of sets that were used over 100 times.

The importance of specific datasets in language model training is illustrated in Figure 6, where they are compared with the percentage of authors who used the given datasets. Nearly 9% of authors used the emotion dataset, seven times as many as the popular Wikipedia. Over 5% of entities trained their models on the IMDb and Squad datasets. The most cited glue dataset was referred to by fewer than 4% authors.

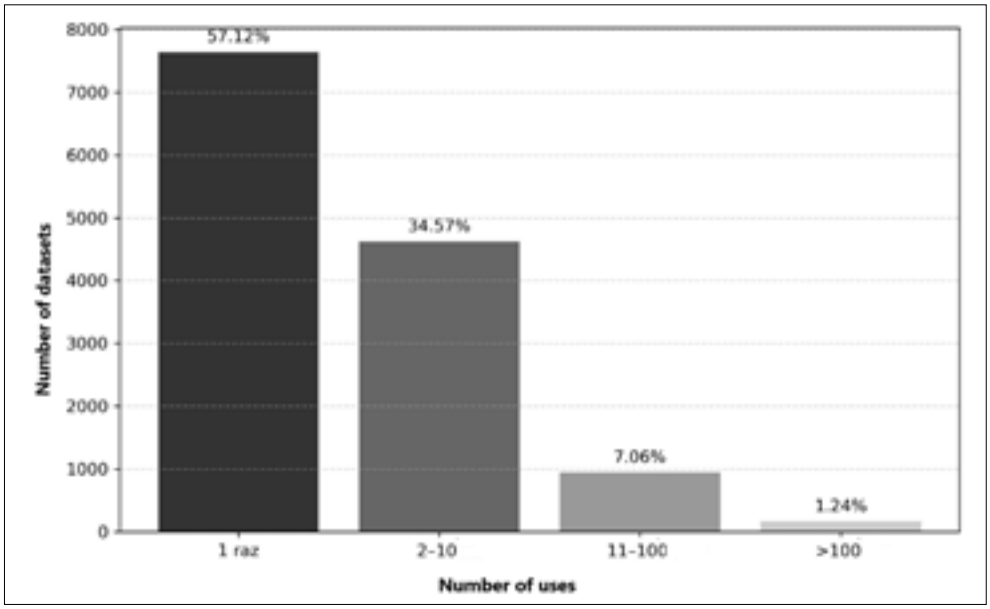

Figure 5. Frequency of dataset use by language models

Source: prepared by the Author.

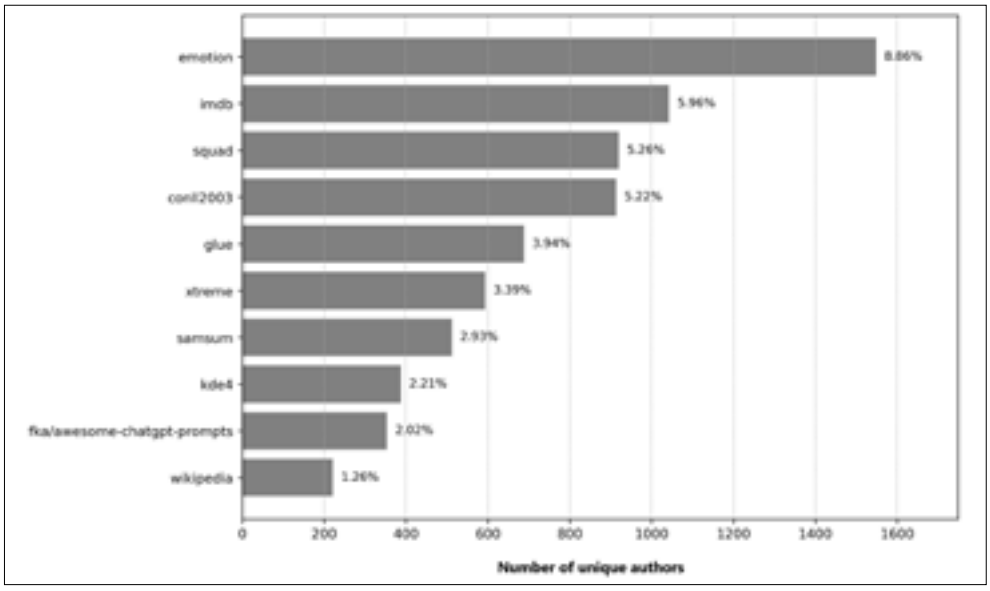

Figure 6. Ten datasets used by the greatest number of model authors

Source: prepared by the Author.

5.3. Is there a correlation between the number of unique datasets used by particular authors and the total number of datasets they have published?

The Pearson correlation coefficient (Figure 7) between the number of unique datasets used and the number of language models published by a given author is 0.44 (p=0.0000), indicating a moderately positive correlation. This means that among authors publishing more language models, there is a tendency to use more diverse datasets. This correlation, however, is not strong.

Language models with different functionalities may, in fact, use diverse datasets, both in terms of type and quality. At the same time, subsequent versions of the same model are usually based on identical data sets, which may limit the diversity of data the author uses.

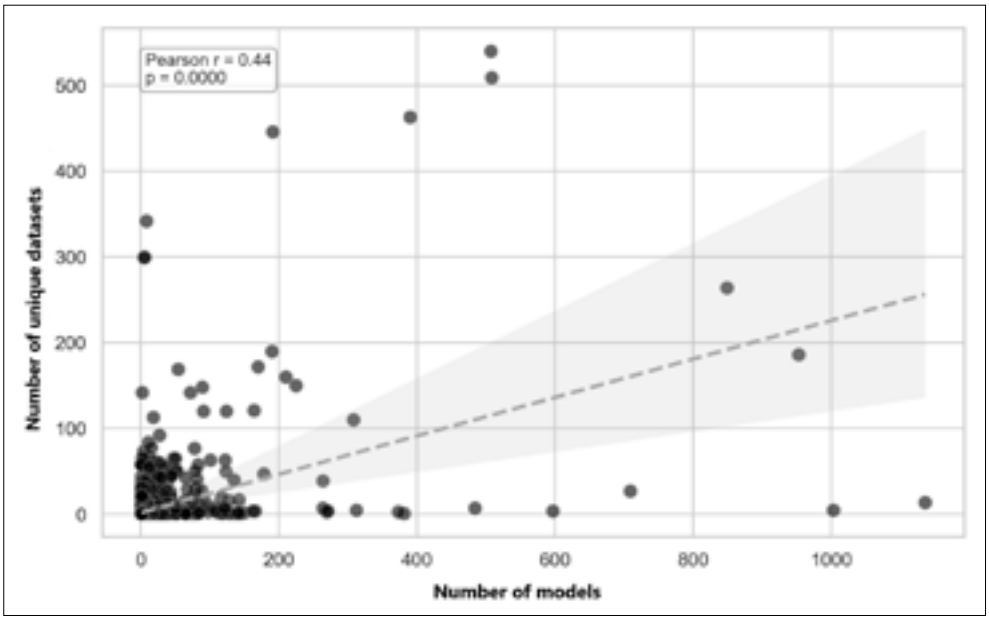

Figure 7. Correlation between the number of unique datasets and the number of datasets published by a given author

Source: prepared by the Author.

5.4. Is there a correlation between datasets and the categories of models where they are used?

The vast majority of datasets, as shown in Figure 8, were used in only one model category. Fewer than 0.5% of datasets were assigned to more than five categories. Typically, one dataset appears extensively in only one category, whereas in others it

is scarcely used. For instance, out of 1,298 occurrences of the IMDb dataset, almost 74% fall into the text classification category. Only fka/ awesome-chatgpt-prompts appears in all 12 categories (*fka/awesome-chatgpt-prompts · Datasets at Hugging Face*, 2024). Most of the categories are characterised by the use of a single dominant dataset. In models in the feature extraction group, this is allenai/c4, while in models performing tasks in the text classification group, it is glue. In contrast, the dominance of the SQuAD dataset is evident in the question answering category.

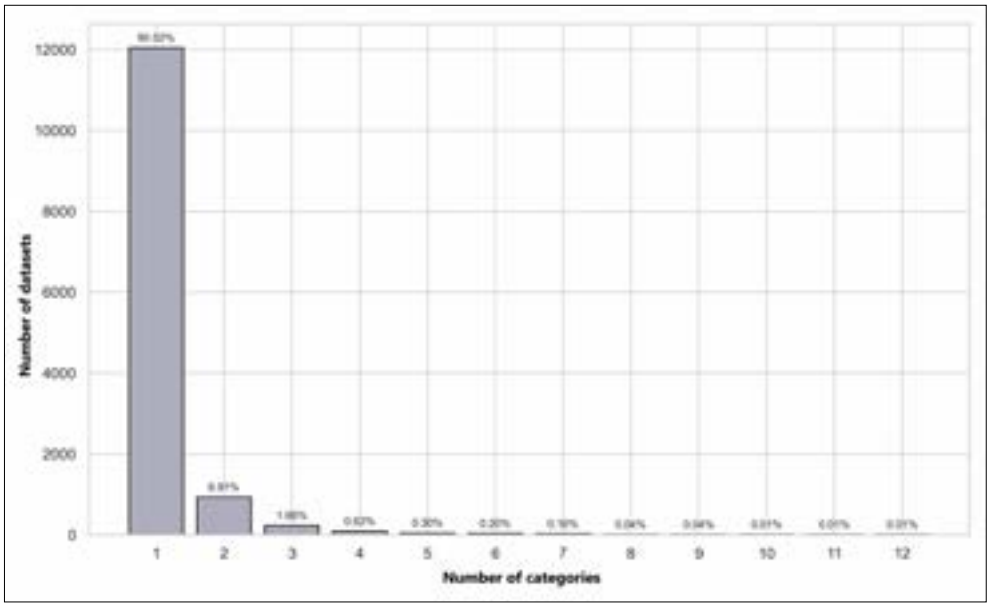

Figure 8. Use of datasets in categories of language models

Source: prepared by the Author..

In those categories, where there are 500 or more models, the ratio of the number of unique datasets to the number of models is relatively low and on average amounts to less than 0.24 (Figure 9). For other categories (excluding zero-shot classification), the indicator is close to 0.41. When combined with the zero-shot classification, it is even larger, though in this case, several models were trained on over 300 datasets, which significantly raises this indicator.

In addition to the zero-shot classification category, it will be even larger; however, in this case, several models were trained on nearly 300 datasets, which significantly increases the aforementioned metric.

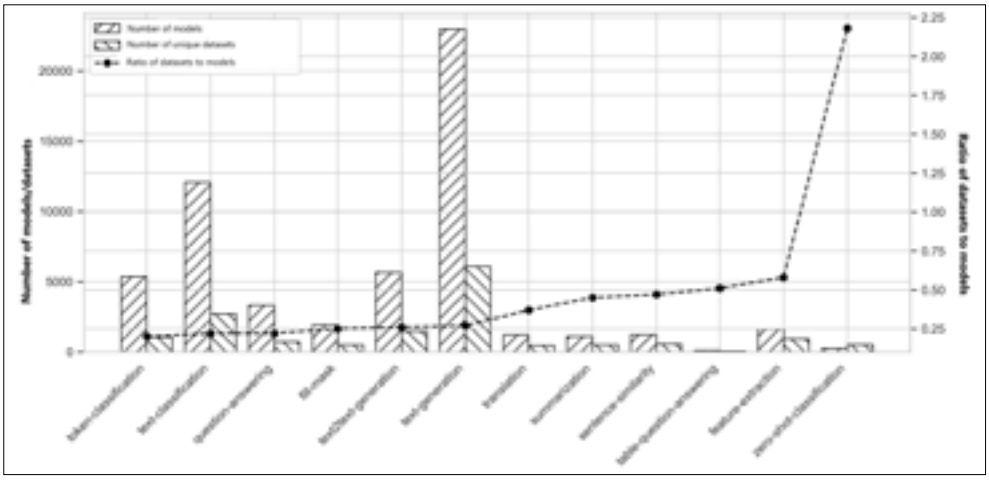

Figure 9. Ratio of the number of unique datasets to the number of models in a given category

Source: prepared by the Author.

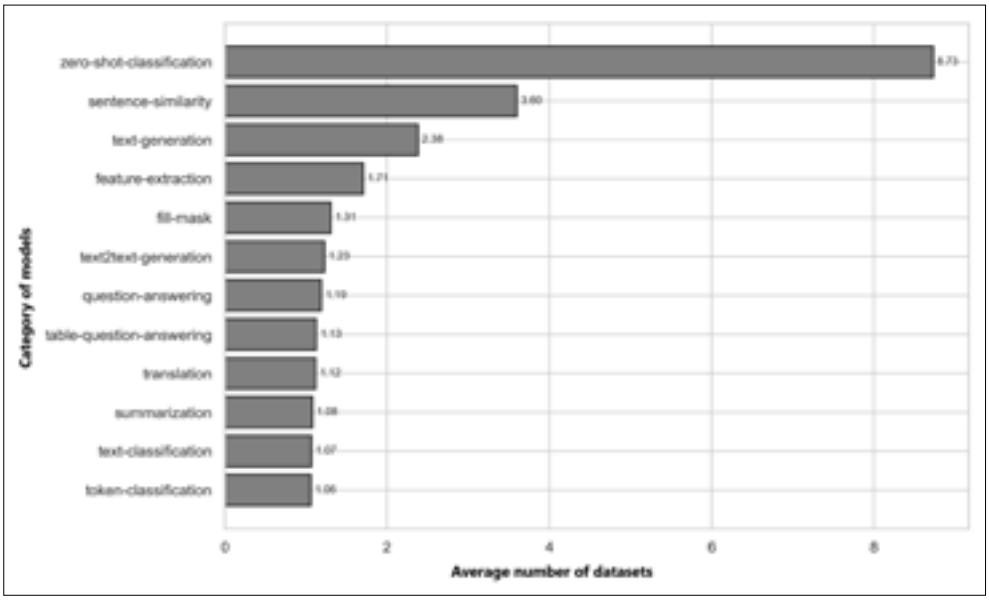

Figure 10. Average number of datasets per model in a given category

Source: prepared by the Author.

The average number of datasets used by language models (Figure 10) is not high, and for the nine categories, it does not exceed 2. It ranges from 2.38 to 3.6 only

in those models which use sentence similarity and text generation. The zero-shot classification models are an exception, where the average amounts to almost 9. As previously mentioned, however, several models in this group used close to 300 datasets.

6. Conclusion

This analysis does not consider the purpose for which a specific data set is used (training, fine-tuning, evaluation). Instead, it focuses on the extent to which datasets are used to train linguistic models of various types. The vast majority of them are trained on only one dataset, and a large number of identified datasets, which were used only once, may indicate their specialised nature. Frequent use of specific sets can be interpreted in two ways: as confirmation of their effectiveness or as an indication of a lack of alternative data of adequate quality. A certain pattern can be noticed in that categories with fewer models demonstrate a greater diversity of data sets used for their training.

Several limitations may affect the accuracy of the results presented in this analysis. Only less than 14% of models were examined, and they often contain incomplete metadata. They frequently lack the names of all the datasets used, as in the example of the RoBERTa model (*FacebookAI/roberta-base · Hugging Face*, 2024). In this case, the complete characteristics of the model, in relation to the datasets, are available only in the publication describing it (Liu *et al.*, 2019).

It is worth noting that many authors publish multiple variants of a single model, using the same datasets. Each variant, being a separate item, somewhat inflates the statistics of the use of specific resources.

While different models in a repository may theoretically refer to the same dataset, in practice, they often use different versions of it. Therefore, the information on datasets should be treated as an indication of their origin rather than a precise designation of the version used.

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Analiza ilościowa zestawów danych i schematów ich wykorzystania w modelach językowych

Abstrakt

Cel/Teza: Celem niniejszej analizy była ilościowa charakterystyka zestawów danych wykorzystywanych do szkolenia modeli językowych. Objęła ona: 1) analizę częstości użycia poszczególnych zestawów danych oraz schematów ich zastosowania w różnych typach modeli, 2) ocenę stopnia zróżnicowania danych wykorzystywanych przez autorów modeli, 3) analizę różnorodności wykorzystania danych w kontekście konkretnych zastosowań modeli językowych.

Koncepcja/Metody badań: Przeanalizowano metadane modeli językowych dostępnych w repozytorium Hugging Face. Uwzględniono tylko te modele, które zawierały informację o nazwie użytego zestawu danych, rozumianego jako zbiór wykorzystywany do trenowania, dostrajania lub ewaluacji modelu. Łącznie przeanalizowano 56 762 modele (13,8% ogółu), których metadane pobrano 6 marca 2025 roku za pomocą biblioteki huggingface-hub. W analizie obliczono m.in. liczbę modeli i autorów, częstotliwość występowania zestawów danych w zależności od kategorii modelu, a także korelację między liczbą unikalnych zestawów danych stosowanych przez poszczególnych autorów a łączną liczbą udostępnionych przez nich modeli. Analiza została przeprowadzona w języku Python z wykorzystaniem bibliotek pandas, matplotlib, seaborn, scipy.

Wyniki i wnioski: Łącznie zidentyfikowano 13 376 zestawów danych. Większość modeli była szkolona na podstawie tylko jednego zestawu danych. Odnotowano, że wśród autorów publikujących większą liczbę modeli językowych widoczna jest pewna tendencja do wykorzystywania bardziej zróżnicowanych zestawów danych. Zaobserwowano także, że w kategoriach z mniejszą liczbą modeli występuje większe zróżnicowanie wykorzystywanych do ich szkolenia zestawów.

Oryginalność/Wartość poznawcza: Analiza ujawnia pewne schematy dotyczące stopnia zróżnicowania wykorzystania zestawów danych w zależności od autora i kategorii modelu językowego.

Słowa kluczowe:

Hugging Face. Model językowy. Sztuczna inteligencja. Zestaw danych.

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A secret weapon? Generative artificial intelligence in the hands of university students: Opportunities and challenges

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Abstract

Purpose/Thesis: This article analyses the opportunities and threats arising from the use of generative artificial intelligence from the perspective of Polish higher education students.
Approach/Methods: The study employed a diagnostic survey method conducted among students of selected Polish universities.
Results and conclusion: The research results revealed the widespread adoption of GenAI in the academic environment, accompanied by a lack of student knowledge regarding the effective and responsible use of these tools, as well as a lack of coherent university regulations.
Originality/Value: The article fills a research gap in the Polish studies and provides practical recommendations for educational institutions and policymakers.

Keywords

Adoption of technology. Artificial intelligence. Education. Generative AI. Higher education. Students.

Text received on the 20th of March 2025.

1. Introduction

Generative artificial intelligence (GenAI), defined as advanced systems capable of creating new content on the basis of training data (García-Peñalvo & Vázquez-Ingelmo, 2023), constitutes a breakthrough technology with a profound impact on information processing. Its unprecedented development in recent years has opened new horizons in higher education, offering the potential for personalised learning, task automation, and enhanced support for both students and faculty (Tzirides *et al.,* 2023; Farrelly & Baker, 2023; Łodzikowski *et al.,* 2024). This dynamic growth is reflected in the surge of global research interest, evidenced by the increasing number of studies examining the impact of GenAI on education,

including a growing body of systematic reviews (Yusuf *et al.,* 2024; Lee & Moore, 2024; Tillmanns *et al.,* 2025).

Despite the rapid global development of GenAI and its implementation in educational contexts, Polish higher education exhibits a degree of inertia in terms of its formal adoption. At present, national academic institutions remain in a phase where consistent policies governing the use of such tools—by both teaching staff and students—have yet to be developed. This gap between technological potential and its institutional recognition creates specific challenges, while not preventing students from actively employing GenAI tools, such as ChatGPT or Gemini, in their everyday academic activities. However, this often occurs without full awareness of their educational potential or of the risks associated with its uncritical use. This situation raises pressing questions for educational systems regarding the role of GenAI in education and underscores the importance of understanding the ways students use these technologies.

The dynamic development of GenAI technologies, together with the growing importance of digital competencies in today's academic and professional environments, provides a strong rationale for undertaking systematic research in this field. This article aims to analyse the opportunities and risks arising from the adoption of GenAI from the perspective of students at Polish academic institutions, focusing on the technological, social, and ethical dimensions of this phenomenon. In particular, it seeks to identify both the potential and the challenges associated with the use of specific GenAI tools, in order to elaborate an educational model that minimises the risks of their inappropriate application.

To achieve this objective, a survey was conducted among students, focusing on two key research questions:

- What is the practice of GenAI adoption among higher education students?
- What potential benefits and challenges associated with GenAI use are perceived by students?

The methodology, based on a diagnostic survey, enabled the statistical analysis of data and, in turn, the formulation of conclusions of relevance both to educational institutions and to policymakers responsible for shaping national educational strategies. This study addresses a significant research gap in the Polish academic discourse regarding students' perceptions and practices in the use of generative artificial intelligence.

2. Research context

Generative artificial intelligence is a rapidly developing field, its tools possessing the capacity to generate new content such as text, images, music, and even computer code. GenAI models, the core components of which are deep neural networks,

exhibit transformative potential across multiple domains of everyday life, and higher education is no exception.

In the context of higher education, GenAI entails both promising opportunities and considerable risks for students and teaching staff alike (Fazlagić, 2022; Pyżalski & Łuczyńska, 2024). Students may benefit from a personalised learning process, enhanced support in writing and research, as well as access to tools that foster creativity and innovation. Conversely, risks include an excessive reliance on technology, instances of plagiarism and academic dishonesty, and a potential erosion of critical thinking skills. For academic staff, GenAI enables them to automate routine tasks, refine teaching practices, and strengthen student engagement. Current academic debates even explore the automation of student assessment through GenAI technologies, such as large language models (Grzesiak *et al.*, 2024). Nevertheless, such directions would not only require rigorous ethical scrutiny but would also need to be assessed for compliance with the AI Act regulations concerning, for instance, high-risk systems (European Commission, 2024).

Beyond the potential benefits for academic staff, the presence of GenAI within the academic sphere also compels them to confront a range of challenges, including the difficulty of detecting plagiarism, the necessity of adapting teaching methods, and concerns of an ethical nature.

Interest in GenAI applications in higher education appears to be stronger and more extensively explored among international researchers. Studies conducted worldwide emphasise the importance of understanding students' perspectives on the impact of GenAI on their education (Chan & Hu, 2023; Kim *et al.*, 2024; Mozelius, 2024; Mozelius *et al.*, 2024). Gaining insight into how students perceive and use GenAI tools is a prerequisite for the effective and responsible implementation of this technology in higher education. It should also be noted that precisely because of the unprecedented possibilities and transformative potential brought by generative artificial intelligence, a holistic approach is indispensable – one that would take into account both innovation and ethical implications – in order to ensure that this technology supports student development and the integrity of the educational process (Francis *et al.*, 2025).

Beyond theoretical discussions of the role of GenAI in higher education, this is vitally complemented by empirical research, which allows us to confront theory and practice. A pertinent example is the study by Francis *et al.* (2025), in which the authors examine university students' perceptions of generative artificial intelligence tools in Saudi Arabia. Drawing on the Technology Acceptance Model (TAM) and the Task-Technology Fit (TTF) framework, the study employed a survey-based methodology. The findings show that 78.7% of students regularly use GenAI tools, with ChatGPT emerging as the most popular (86.2% of respondents). Students reported using these tools primarily for defining and explaining concepts, translation, generating ideas for writing, and summarising academic literature.

They particularly valued the convenient access, time efficiency, and immediate feedback. At the same time, respondents expressed concerns about subscription costs, unreliable information, plagiarism, diminished human interaction, and the potential impact on learning autonomy. This research underscores the importance of raising awareness about GenAI, establishing ethical guidelines, and strengthening safeguards for academic integrity in order to promote the responsible use of these technologies in higher education.

The findings reported above regarding the scale of GenAI use in higher education receive preliminary, local confirmation in the research of Polish authors (Raszyd *et al.*, 2024). Nevertheless, the study presented in this article was conducted in a different geographical setting and employed a questionnaire with a distinct structure – one that explicitly differentiated between the applications of GenAI and specific tools. Notably, this study broadens the scope of analysis to include ethical considerations, students' expectations of institutions, and the assessment of prospective GenAI-related skills in the evolving labour market. Such an approach represents a significant expansion on previous studies and helps address the research gap that has emerged in this field.

The sharp increase in the popularity of generative artificial intelligence among university students has also been observed in Poland, initially provoking concern among academic staff. This reaction is understandable, given the natural human tendency to feel apprehension toward new and unfamiliar technologies. It is worth noting that research by Fox and Shaw (2023) indicates that the level of adoption of these technologies is significantly higher among students than among lecturers.

Nevertheless, within a relatively short period, some academic institutions took the initiative to develop their own guidelines regulating the extent and scope of GenAI use by students. Among these institutions are, for example, the University of Warsaw, the Medical University of Silesia in Katowice, and the SGH Warsaw School of Economics. The introduction of such regulations should be regarded as a step toward structuring the process of GenAI use, providing students with clear points of reference. By contrast, leaving decisions regarding the use of GenAI to individual lecturers can, and often does, lead to confusion and frustration among students.

Yet for such regulations to be truly effective, they should meet several criteria, including consistency, verifiability, and validity. Consistency refers to the alignment of GenAI-related regulations with the general principles of academic ethics and university policies. They must also be internally consistent, that is, applied uniformly and logically across different media (e.g., text, images, etc.). Verifiability concerns the ability to assess whether a student has made unauthorised use of GenAI. Validity, in turn, means that the regulations should rest on sound substantive foundations and take into account the specificities of individual academic disciplines.

In this context, one may look, for instance, at the regulations introduced at a Polish university concerning the preparation of written assignments by students.

In particular, the provisions:

- *prohibited: generating text (paragraphs, chapters), generating a first draft of a text, and then editing it independently, or expanding existing content (e.g., through prompts such as "add two sentences to the paragraph");*
- *permitted: language correction, stylistic correction, clarification of meaning, and text structuring*

will be hard to verify, though the intentions behind them are clear. Both the full generation of text by a large language model (as in the first point) and its mere stylistic correction (as in the second point) produce output with a word distribution typical of such models. As a result, automated detection tools are likely to classify both cases in the same category. In this context, it is worth considering how the nationwide anti-plagiarism system, recently adapted to detect GenAI technologies (CEO.com.pl, 2024), may influence student behaviour. Will the system force students who use large language models for text correction to introduce manual changes into the pre-edited content—possibly reducing its readability for lecturers, reviewers, or supervisors, but enabling it to pass the "anti-plagiarism" test? Or will strict institutional rules and restrictions instead lead students to continue using GenAI while combining it with tools designed to "humanise" generated content?

Another set of regulations at the same university, this time concerning the generation of computer code, deserves attention because of its debatable consistency with the analogous rules on text generation. These regulations state:

- *permitted: generating code based on an algorithm description.*

If students are not permitted to generate text based on an outline, why then are they allowed to generate code in this way? Would this not lower their level of proficiency in the syntax of a given programming language? And what exactly does an "algorithm description" mean in this context? Is it sufficient for a student to write "generate code that sorts an array of numbers," or perhaps "generate code that sorts an array of numbers using the bubble sort method," or should the description go even further, down to the level of stating the dominant operation of comparing two numbers and indicating what should follow? These questions are important because one approach can be applied without any knowledge of algorithms, while the other assumes such knowledge and uses the technology merely as a way of outsourcing the grammar of a given programming language. A ban on generating programming-language texts would be more consistent with the restrictions on generating natural-language texts, while permitting the use of GenAI for program code refactoring and optimisation would align more closely with the allowance of language and stylistic correction.

Another point that clearly deserves attention, given its questionable verifiability, is:

- *required: the documentation of all submitted prompts and corresponding responses (excluding ideation and text operations) is mandatory; the thesis*

supervisor has the right to receive a file containing these prompts together with the AI-generated outputs.

The functioning of GenAI is inherently non-deterministic and probabilistic, which means that its outputs cannot be exactly reproduced. This is because the services most commonly used by students do not allow users to adjust low-level parameters, such as the seed value of the pseudorandom number generator. GenAI systems produce content by analysing data and estimating the statistical likelihood of particular elements, such as words or phrases. As a result of this random component, even repeated attempts to generate a response to the same prompt may—and in most cases will—yield different results. A further reason for this lack of reproducibility is the ongoing release of new model versions by providers, which may operate either subtly or markedly differently than their predecessors.

To conclude this section of the paper, it is worth turning once again to international research—this time from Hong Kong. In the article *A critical review of GenAI policies in higher education assessment: a call to reconsider the "originality" of students' work* (Luo, 2024), the author examines the policies of 20 leading academic institutions worldwide regarding generative artificial intelligence. Drawing on the WPR model (Luo, 2024), the study identifies the principal concern of academic institutions in this context as the potential undermining of the originality of student work. GenAI is perceived as an external tool that threatens the authenticity of a student's intellectual contribution. Yet the author argues that framing the issue this way fails to consider how the development of GenAI further complicates the very process of producing original work and what originality means in an era when knowledge production is increasingly distributed, collaborative, and technologically supported. Accordingly, in the context of rapid technological advancement and the shifting definition of knowledge, higher education policy should take into account the evolving concept of originality in the digital age and promote a more comprehensive and equitable approach to assessing student contributions.

3. Research procedure

To investigate the opportunities and challenges associated with the use of generative artificial intelligence (GenAI) from the perspective of students in Polish higher education, this article employed the diagnostic survey method. The choice of this method was motivated by its suitability for exploring the opinions, attitudes, and experiences of a group of respondents in relation to a specific phenomenon—namely, the rapidly evolving technology of GenAI. An example of the domestic application of this method is a study on academic tutoring as a form of personalised

education at the Kraków University of Economics (Kolasa & Guzdek, 2020). Since personalised academic tutoring is regarded as one of the primary applications of GenAI in higher education, the results of that study serve as an important point of reference for the analyses presented in this article.

The quantitative data collected were subjected to descriptive analysis, which included, among other elements, the presentation of response distributions for individual closed-ended questions in the form of charts, along with their interpretation (quantitative analysis). Such a presentation of the results made it possible to identify dominant trends and patterns in the use and perception of GenAI among students. In turn, the responses to the open-ended questions underwent qualitative analysis, which involved identifying key themes, categories, and patterns in statements. This process provided a deeper understanding of students' motivations, concerns, and expectations in relation to GenAI, thereby enriching the quantitative findings with a qualitative perspective.

It should be emphasised that, due to its innovative character, limited scale, and exploratory aim within the context of Polish higher education, this study may be regarded as a pilot, i.e., preliminary. Its purpose was to identify key areas and issues related to the adoption of GenAI by students, thereby contributing to existing knowledge and laying the groundwork for future, more extensive research in this field. Although the findings have not been verified through advanced statistical methods, they nevertheless provide valuable empirical insights and may contribute to further discussion as well as to the formulation of practical recommendations for educational institutions and policymakers.

The questionnaire was made available in a form that ensured anonymous responses, with the aim of minimising the effect of social influence and providing respondents with the comfort and freedom to express their opinions sincerely. The survey link was distributed through the internal communication channels of [University 1] and [University 2], and the academic community was encouraged to further disseminate it among students, including those from other higher education institutions. This mode of distribution was intended to increase the sample size and to encompass a broad spectrum of study fields and levels.

The study was voluntary, meaning that participation was not compulsory and depended solely on the individual decision of each student. Data were collected between 10 February and 24 March 2025.

The questionnaire consisted of both closed- and open-ended questions, divided into thematic sections designed to examine patterns of generative artificial intelligence use in the academic environment.

The questionnaire employed a conditional structure that allowed the questions to be tailored to respondents' experience with GenAI technologies. Participants who declared that they had not used GenAI were asked to respond to questions concerning the reasons for this, with available options including concerns about

the reliability of generated content, the potential violation of academic rules, and the lack of skills for effective use of these tools. The data obtained this way made it possible to identify factors limiting the use of GenAI in the academic environment. By contrast, respondents who reported at least occasional use of GenAI were asked to provide information on the ways in which they employed it. This approach yielded more precise and relevant data, adjusted to the individual experiences of the participants. Members of this group were also asked to indicate the frequency of their use of the technology, which enabled the identification of typical patterns of engagement—ranging from sporadic use to daily interaction.

An important aspect of the study was also determining the context in which GenAI tools are applied. Students indicated the situations in which they most often use these technologies, selecting from areas such as essay writing, text improvement, translation, note generation, coding, and data analysis. This made it possible to identify the dominant modes of GenAI use within academic practice.

In addition, students were asked about the specific GenAI tools they use most frequently, which provided information on the most popular solutions and services adopted in the student community.

Respondents were also invited to indicate their reasons for turning to GenAI tools, allowing for an understanding of the motivations underlying their use. Finally, the extent to which students perceive GenAI as a tool supporting knowledge acquisition was assessed using a five-point Likert scale.

In addition, respondents were asked how many of their acquaintances make use of GenAI. This question served two key purposes:

- to obtain a broader picture of the scale of GenAI adoption in the academic environment, extending somewhat beyond the limits of the study sample,
- to mitigate the potential sampling bias resulting from the possibility that the decision to complete the questionnaire was correlated with the respondent's individual level of engagement with GenAI.

Subsequent questions concerned the potential difficulties and problems encountered when using GenAI, such as misinformation, technical barriers, subscription costs, or non-compliance with academic requirements, as well as ethical issues. The last one raises the greatest concern, from the risk of plagiarism to the lack of source transparency.

Respondents were further asked whether, in their view, academic institutions ought to introduce regulations on the use of GenAI, providing insight into the perceived demand for institutional guidelines.

To evaluate the impact of GenAI use on the development of academic skills, two questions were included in the survey that addressed critical thinking and independent learning. Responses were collected on a five-point scale, which made it possible to precisely assess the perceived influence of this technology on competencies regarded as essential for higher education.

The questionnaire further inquired into whether academic institutions offer training or guidelines on GenAI, which made it possible to assess the degree of institutional support in this area.

The final part of the questionnaire explored students' views on the future: respondents indicated whether they believed that proficiency with AI tools would become a key competence in the labour market and identified potential changes they would like to see in the integration of GenAI into education.

4. Analysis of the findings

The study yielded 98 responses from students at Polish academic institutions, which makes it possible to present significant trends concerning the use of generative artificial intelligence in the academic environment. The analysis of the findings was divided into two parts: the first covers responses to the closed-ended questions, enabling a quantitative assessment of the scale of adoption, modes of use, and the perceived barriers and benefits of GenAI; the second focuses on the open-ended questions, which provide deeper insight into students' individual opinions and experiences.

4.1. Closed-ended questions

An analysis of the survey results reveals the broad scale of generative artificial intelligence adoption among students at Polish academic institutions. The very high proportion of users, together with the diverse applications they report, points to the significant role that GenAI tools already play in students' everyday academic life. At the same time, the study allows us to identify the barriers, motivations, and perceived risks associated with their use.

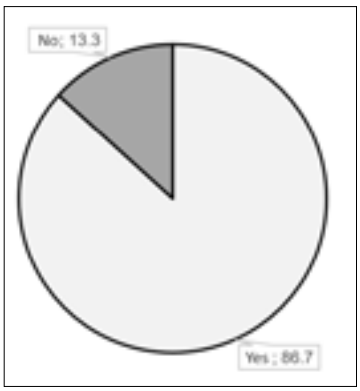

Figure 1. Percentage of students using GenAI in relation to education

Source: prepared by the Author.

The first important finding concerns the scale of GenAI adoption: more than 86% of students reported using these tools for academic purposes (Figure 1). Moreover, approximately three-quarters of all respondents indicated that most of their acquaintances also make use of such technologies. This means that GenAI has become an integral component of the academic environment. On the other hand, the small group of students who choose not to use GenAI most often justify their decision by citing concerns about violating academic rules, lack of trust in the generated content, ethical reservations, or simply the absence of any perceived need for such tools.

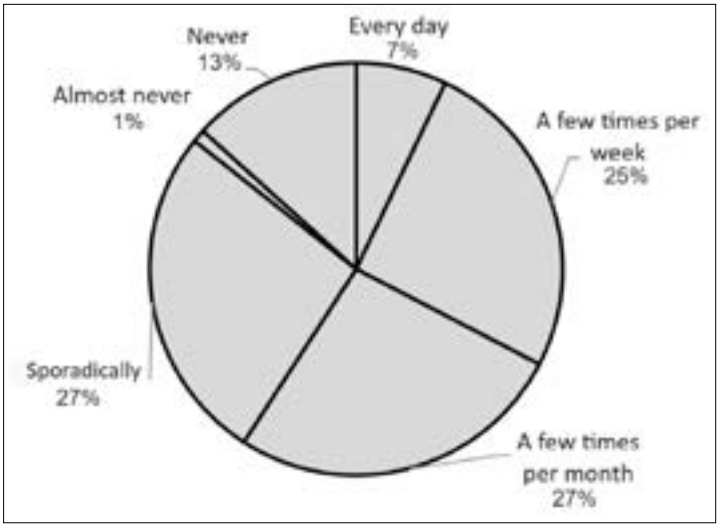

Figure 2. Frequency of GenAI usage by students

Source: prepared by the Author.

Among students who use GenAI, a considerable share relies on it regularly: more than two-thirds of respondents reported engaging with it at least several times a month (Figure 2), and within this group, nearly half—amounting to almost one-third of all respondents—use it several times a week or more. This suggests that GenAI functions not as an occasional aid in the educational process but as a tool integrated into students' learning practices on a continuous and systematic basis. The most common applications of GenAI tools include correcting errors in texts, creating notes and summaries, generating ideas, and searching for literature and other sources of information (Figure 3). This suggests that students perceive GenAI as both a support in organising their academic work and a tool that facilitates creativity and cognitive processes.

In terms of the popularity of individual tools, ChatGPT stands out as the clear leader. Other solutions mentioned by respondents included Copilot, Gemini, and

Notebook LM, although their popularity is markedly lower. The dominance of a single tool may be explained by its wide availability, intuitive interface, and effectiveness in carrying out tasks expected by academic users. It is also worth noting that ChatGPT, in its highly functional and widely accessible form (already in version 3.5), was the first tool of this kind to be made broadly available. At present, other services appear to be catching up with—and in some respects even surpassing—their precursor.

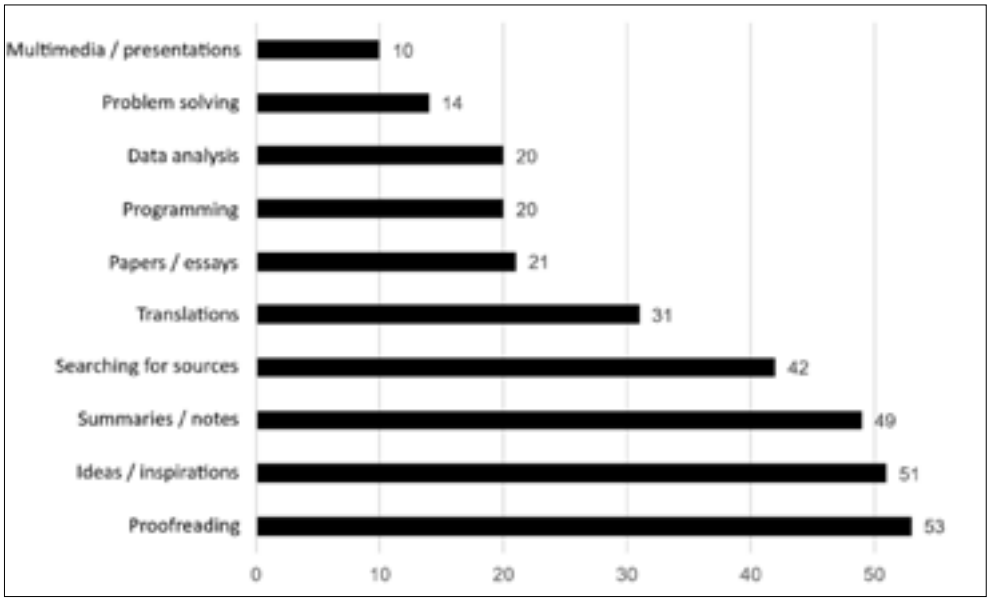

Figure 3. Areas of GenAI application by students (multiple-choice question)

Source: prepared by the Author.

Students acquire knowledge about using GenAI tools primarily through online sources and their own experimentation (Figure 4). At the same time, their self-assessment of competence in this area is moderate—around two-thirds of students rate their knowledge of GenAI as average, basic, or very low. This indicates that despite widespread use, there remains a deficit in conscious and effective engagement with these technologies.

The main motivation for using GenAI is to save time and make learning easier. It was mentioned more often than the need to solve difficult problems or the desire to experiment. This finding underscores the pragmatic nature of how these technologies are used – students tend to view them primarily as tools for improving efficiency rather than as a way of expanding their technological skills.

More than half of the students believe that GenAI tools help them learn more effectively, rating their impact as 4 or 5 on a five-point scale. This suggests that

students recognise clear educational benefits from these technologies, although it may also point to a growing dependency on them in the learning process.

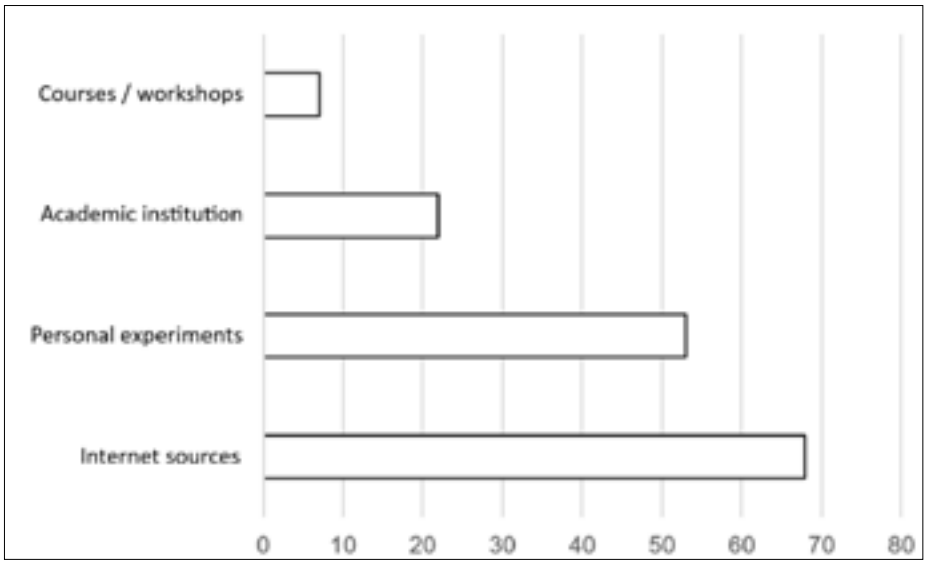

Figure 4. Methods of acquiring GenAI competences (multiple-choice question)

Source: prepared by the Author.

The main obstacles to using GenAI identified by respondents included a lack of trust in the truthfulness of generated information, a lack of compliance with academic requirements (e.g., institutional or lecturer-level bans on the use of such tools), concerns about privacy and data confidentiality, and the necessity to cover the cost of subscriptions to more advanced service versions. These findings suggest that, despite the high level of GenAI adoption, significant barriers persist and may limit its wider use in the academic environment.

Ethical concerns associated with the use of GenAI revolve around issues such as a lack of self-reliance in learning, the risk of committing plagiarism, the opacity of sources of information on which these tools rely, and the possibility of generating content containing biases or inaccuracies (so-called "hallucinations"). These concerns indicate that students are aware of the potential risks of using such technologies, even if they do not necessarily refrain from doing so.

The regulation of GenAI use in higher education remains an open question: fewer than one-third of respondents believe that academic institutions should introduce formal rules in this area, while the largest share of students expressed no clear opinion on the matter. This may point to the absence of consensus among students as well as to insufficient institutional efforts to inform them about potential regulations.

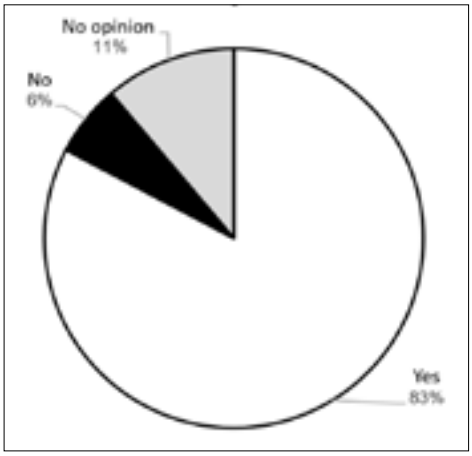

Figure 5. GenAI as a key competence in the labour market

Source: prepared by the Author.

The findings indicate that students are aware of the potential weakening of independent learning resulting from the use of GenAI; at the same time, however, nearly 90% believe that the ability to work with these tools will become a key competence in the labor market (Figure 5). This shows that the younger generation perceives GenAI not only as a tool supporting their current education but also as an essential element of future professional requirements.

In summary, the findings show that GenAI tools are widely and consistently used by students at Polish academic institutions. They are employed mainly to support learning and organise academic work, with their popularity centred on a few dominant solutions, most notably ChatGPT. At the same time, barriers remain, including limited trust in generated content, institutional restrictions, and ethical concerns, all of which shape how students engage with these technologies.

A particularly concerning finding is that students acquire most of their knowledge about GenAI from online sources of unmonitored quality. This likely reflects the fact that the topic has not yet been widely or systematically covered in academic literature, including textbooks and scholarly works, in a way that integrates technical, ethical, and practical perspectives on its use in education and research. This status quo may contribute to the superficial understanding of the possibilities and limitations of GenAI, and thus to suboptimal and potentially problematic uses of these tools in the academic environment.

4.2. Open-ended questions

This section presents the analysis of students' responses to two open-ended survey questions. The analysis included only those statements that contributed

substantively to the discussion, while non-informative or imprecise formulations were omitted. In both cases, the responses were organised along a spectrum: beginning with the most sceptical positions – advocating for restrictive approaches or limiting the use of GenAI—and moving toward opinions supporting the unrestricted admission of GenAI tools into the educational process.

The analysis of responses to the first question (*Should academic institutions introduce regulations concerning GenAI, and if so, what kind?*) reveals a clear polarisation of views. The most critical opinions advocate very strict measures. For instance, one respondent expressed an unequivocal rejection of GenAI use in the form of the statement: "A total ban."

Another response included a set of detailed regulatory proposals aimed both at identifying and at limiting the unauthorised use of artificial intelligence tools: "Academic institutions should introduce regulations concerning GenAI. In my view, these should include: the obligation to label content generated by AI as GenAI (including translations produced with AI), a ban on writing theses and coursework with AI, the possibility of verifying whether a text was generated by AI, and courses on copyright, accountability, and the ethics of AI use."

A similar position was voiced by a respondent who emphasised that, while a complete ban may be unrealistic, only restrictions on the use of GenAI could foster the development of critical thinking, creativity, and independence: "Regulations should definitely be introduced. A total ban on the tool is unfortunately impossible, but restricting it should preserve the critical thinking, creativity, and independence of future generations."

Another position emphasised the need to monitor the flow of content within university systems in order to prevent AI interference in the grading process: "There should be stricter monitoring of content flow on university computers to exclude the possibility of artificial intelligence influencing assessment."

In the context of detecting inauthentic content, one respondent proposed the introduction of an anti-plagiarism system explicitly dedicated to AI-generated material: "I would like the Unified Anti-Plagiarism System to be able to detect content created with artificial intelligence, or for a separate system to be developed for this purpose (and if one already exists, for it to be implemented). Any proven use of AI by a student—even for 'smaller' assignments (e.g., homework or projects)—should be recorded by the lecturer and penalised with a lower grade."

Some respondents, however, advocated for moderate regulations that would not restrict the possibility of using GenAI but would emphasise its role as a support tool rather than a substitute for independent work. For example, one response stated: "Students should not rely 100% on GenAI, instead only supporting their work with occasional assistance from artificial intelligence."

Other responses pointed to the need for restrictions limited only to the copying of content, while still allowing the search for sources and the conduct of research:

"Possibly searching for sources, doing research, but without the possibility of copying content or text that one could then sign their name under."

In addition, some voices pointed to the need to raise students' awareness of the problems associated with the use of GenAI, while ultimately leaving the decision about its use to the users' own conscience: "I believe this should be a matter of conscience for those using AI, because I personally am dyslexic and dysgraphic and I use AI for paraphrasing and checking spelling mistakes, and I would not want anyone to claim that my papers were written by AI."

The final responses to this part focused on preventing the penalisation of students, while advocating for the effective use of GenAI tools, arguing that restrictive regulations could hinder the development of skills valuable on the labour market: "Academic institutions should provide access to GenAI for all students and should not punish them for using it. Requiring theoretical descriptions in reports makes little sense now that everyone has access to such tools. Students can gain a lot by learning to work with these tools, especially in programming and data analysis. As a university, [University 2] should keep up with the times and allow students to learn what is required on the labour market."

In summary, the responses to the question on regulation in the context of GenAI reveal a broad spectrum of positions—from those advocating for strict restrictions aimed at safeguarding critical thinking and preventing unethical uses of the tools, to those emphasising the need to integrate GenAI as a means of fostering students' skills and creativity. There was a recurring reflection among respondents that only well-balanced regulations, combining elements of control with education and the promotion of responsible use, can ensure the positive application of GenAI's potential in the academic environment.

The second open-ended question addressed expectations regarding changes in the integration of GenAI tools into teaching processes. It was formulated as follows: "What changes, if any, would you like to see in the way GenAI is integrated into education?" Based on an analysis of the responses, we can once again extract positions ranging from the most sceptical – emphasising the risks associated with uncontrolled use of the tools – to those calling for the active integration of GenAI into curricula.

At the outset, several responses expressed a clearly negative attitude toward the presence of GenAI in education. One female respondent, articulating an ambivalent stance toward GenAI, stated: "I am sceptical about artificial intelligence and view it very negatively. I would like to participate in an event where the potential of combining GenAI with education would be presented, because such potential certainly exists. I think such an initiative could mark the beginning of a larger project and encourage me and others to view AI in a different light. However, I would not want artificial intelligence to be presented only in superlatives—its advantages are just as important as its drawbacks."

Other voices expressed moderate scepticism, focusing on the need for the critical verification of information generated by AI. One respondent wished "that people would not believe everything GenAI writes." At the same time, another argued that "teachers should make students aware of both the strengths and weaknesses, emphasising the need to develop critical thinking skills and to verify knowledge." Within this perspective, education on how GenAI tools actually function was seen as essential, as another participant explained: "I believe this is a more complex problem. I am very concerned that even in classes, LLM systems are called 'artificial intelligence' and are practically personified. In my opinion, this stems from a misunderstanding of how such programs actually work, which is dangerous. Therefore, above all, there should be education about how these programs really operate."

Subsequent responses included calls for a more active integration of GenAI into the teaching process. One statement pointed to the need for AI to be used as a tool that facilitates knowledge acquisition: "Lecturers should encourage students to work with these tools. Even though they often provide incorrect answers, they allow for faster testing of ideas, checking unusual solutions, and quicker learning."

Another respondent emphasised that GenAI should be applied to the search for teaching materials, which could streamline class preparation: "I would like AI to better find the materials I need to prepare for classes so that I don't have to run to the library."

Yet another opinion called for the introduction of dedicated courses that would cover both the technical and ethical aspects of GenAI use: "Yes. There should be classes on the possibilities of AI use, copyright issues, accountability rules, and the ethics of its use. In addition, it should be shown that AI is present in the world, on what principles it operates, how to use it, and how to label content generated by it."

At the other end of the spectrum, some respondents supported fully integrating GenAI into educational programs, seeing it as a tool to support rather than replace the learning process: "I would like the topic of GenAI to be more present in the curriculum (maybe even as a separate course?). I would also like to see assignments connected to GenAI and how to use it properly (and ethically)." and: "Teachers should show students both the advantages and disadvantages of using GenAI, rather than treating it as something inherently bad – maybe 2–3 classes on ChatGPT and AI, and discussions about how AI can be used in learning."

In summary, the opinions on integrating GenAI into education reflect the complexity of the issue. On the one hand, there is a sceptical position that fears the negative impact of AI on the development of critical thinking skills. On the other hand, there are calls for the active integration of GenAI tools into the didactic process, provided they are paired with education about their functionalities and limitations.

An analysis of students' responses to open-ended questions reveals a clear dichotomy. Regarding regulations, some call for severe measures – even outright bans or strict supervision of GenAI use – to protect academic values such as originality

and critical thinking. Others, however, saw GenAI as valuable support in learning, calling for an approach based on education, transparency, and user responsibility. Regarding the integration of GenAI into education, some voices – though initially sceptical – gradually shift toward proposals for the active introduction of these technologies through dedicated courses, workshops, and practical assignments. Overall, the findings suggest the need for compromise solutions that will simultaneously enable the effective use of GenAI's potential while protecting the teaching process from unwanted side effects.

5. Conclusions

The findings of this study clearly indicate that generative artificial intelligence has become an inseparable part of academic life. Virtually every student has encountered tools based on these technologies in the course of their studies, and two-thirds use them on a regular basis. The range of applications is remarkably broad, encompassing text correction and improvement, note-taking and summarisation, translation, as well as programming, idea generation and inspiration, literature searches, and many other tasks. The scope of this phenomenon demonstrates that GenAI is no longer merely a technological novelty but has become an integral – albeit often informal – supporting part of the educational process.

At the same time, the results reveal a serious problem concerning the level of students' knowledge about the use of these technologies. More than half of the respondents assess their knowledge of GenAI as no more than average or basic. In reality, this state may be even worse, particularly in relation to the ethical aspects of using these tools and to their effective use. Many respondents use GenAI intuitively, which can lead to a lack of awareness of these technologies' limitations – including potential errors, the risk of spreading misinformation, and privacy and copyright issues. As a result, students may be vulnerable to uncritical acceptance of AI-generated content, which can reinforce inaccuracies and unintentionally violate academic integrity. Without adequate preparation in this area, there is a real risk that the unskilled use of GenAI could, in the future, become one of the factors undermining the quality of education and intellectual work.

The situation is further complicated by students identifying the internet and their own experimentation as their main sources of knowledge about GenAI, reflecting the lack of a systemic approach to this topic within academic institutions. In light of the growing popularity of these tools, it has become essential to develop coherent guidelines and educational programs that will enable students to take advantage of the uses offered by generative artificial intelligence not only effectively but also responsibly. At present, in many institutions, the decision on whether to use GenAI is left to individual lecturers, resulting in unequal treatment of students

and inconsistent regulations within the same university. In one class, such tools may be regarded as a valuable aid to learning, while in another their use may be strictly prohibited. This state of affairs creates frustration among both students and academic staff, and the absence of a clear institutional stance only increases the chaos and confusion.

Equally concerning is the lack of comprehensive literature in Polish that would address the topic of GenAI in a systematic way and could be recommended by lecturers. As a result, students are left to rely on online content, the quality of which is often difficult to verify. Given the growing importance of this technology, the absence of reliable educational materials represents a significant gap that should be filled as quickly as possible.

Nearly 90% of students believe that the ability to use GenAI technologies will become a key competence in the labour market. Consequently, education directly in the field of GenAI—or supplemented by competencies in the use of tools based on these technologies—may become one of the main criteria future students consider when choosing a university. If higher education does not adapt to these changes, there is a considerable risk that institutions that ignore this phenomenon will become less attractive to new generations of applicants, which, in the long run, may translate into reduced competitiveness and, in turn, a decline in student enrollment. To prevent this, academic institutions should take concrete steps. Above all, academic authorities should clearly define their position on the use of GenAI in the course of study, rather than leaving such decisions to individual lecturers. Furthermore, it would be advisable to consider incorporating GenAI-related elements into curricula where appropriate, as well as introducing specialised courses in fields that stand to benefit most from these technologies. Practical classes on the responsible and effective use of artificial intelligence could help students develop skills that will be invaluable in a rapidly changing labour market.

Despite its limitations, the study provides solid empirical evidence that can serve as a foundation for shaping future educational policy and teaching strategies at the university level. The high rate of GenAI adoption among students, its recognition as a key competence for the future, and the reported benefits to the learning process constitute strong arguments for adopting a structured approach to integrating these tools into the academic environment. The barriers identified—such as ethical concerns, lack of trust in generated content, and unclear regulations—should not lead to outright prohibitions but rather highlight areas requiring urgent educational and normative intervention. The findings clearly imply the need to invest in developing students' (and staff's) digital and information literacy, moving beyond intuitive use toward the conscious, critical, and ethical application of GenAI. Students' calls for dedicated courses and clear guidelines can serve as direct input for designing curricula that will prepare graduates for effective work in a world increasingly dominated by artificial intelligence.

From the perspective of information science and, more broadly, the field of information studies, the findings presented here shed light on the rapidly evolving information ecosystem within academia. GenAI tools not only reshape traditional processes of information retrieval and access but also affect how information is created, organised, and evaluated. The study highlights the key challenges related to information and digital literacy in the era of generative artificial intelligence, pointing to the pressing need to develop in the students the ability to critically assess AI-generated content, to recognise its limitations (e.g., hallucinations and potential errors), and to be aware of the sources on which these models are based. The ethical concerns raised by respondents—regarding plagiarism, intellectual property rights, transparency, and accountability—are fundamental issues for information ethics and represent a vital area of both research and teaching within information science. This study thus contributes to a deeper understanding of how new information technologies influence the information behaviour of users, didactic processes, and information management in academic contexts, which is of key importance for the further development and adaptation of this discipline to contemporary digital reality.

In conclusion, as a society, we are no longer standing on the threshold of the revolutionary changes that GenAI technologies bring to the labour market—this revolution is already underway. AI-based tools are now supporting programmers, artists, managers, marketing specialists, and representatives of many other professions, demonstrating their real potential to increase efficiency and productivity. With each passing year, their significance will only grow, and those lacking the ability to work with GenAI may find themselves at a disadvantage in the job market. For this reason, every university should consider clearly defining its stance on these technologies and their role in academic education. Neglecting this issue may result not only in a loss of interest from prospective students but also in leaving graduates without the key competences required in today's professional environment. Institutions that fail to adapt to this reality risk offering outdated curricula and producing graduates ill-prepared for the demands of a labour market that does not wait for latecomers.

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Survey Form:

Adoption of GenAI technologies in academic practices

GenAI is a type of artificial intelligence capable of creating new content, such as text, images, music, and even code. It works by learning from large datasets and generating new content based on that knowledge. This can be compared to an artist who studies different painting styles and then produces a unique work of art. The most well-known service of this kind, and the first to be made publicly available, is ChatGPT.

- Do you use GenAI tools (e.g., ChatGPT, Gemini, Claude, Copilot) in relation to your studies? [Response scale: Yes | No]

Patterns and frequency of GenAI use for academic purposes.

- How often do you use GenAI for academic purposes? [Response scale: Almost never | Sporadically | Several times a month | Several times a week | Every day]
- In what situations do you most often use GenAI?
  - Writing essays/papers
  - Correcting errors and improving text quality
  - Taking notes/summarising
  - Translating text *from* or *into* a foreign language
  - Creating multimedia content/presentations
  - Coding/programming
  - Solving logical/mathematical problems
  - Generating ideas/inspiration
  - Searching for literature and other sources of information/knowledge
  - Data analysis
  - Other: _____
- Which GenAI tools do you use most frequently?
  - ChatGPT
  - Gemini
  - Microsoft Copilot
  - Claude (Anthropic)
  - Other: _____
- Where do you gain knowledge about GenAI?
  - internet / social media / YouTube
  - Online courses/workshops
  - University/lecturers
  - Personal experimentation
  - Other: _____

- How would you assess your knowledge of GenAI? [Response scale: Very low | Basic | Moderate | Good | Very good]

Motivations and goals for using GenAI in academic work

- Why do you use GenAI?
  - Saving time
  - Willingness to experiment
  - Solving difficult problems
  - Facilitating learning
  - Other: _____
- Do you think GenAI helps you learn more effectively? [Response scale: 1 – *No help at all* to 5 – *A great help*]
- How many of your peers use GenAI tools for academic purposes? [Response scale: Almost none | Few | About half | Most | Almost all | I don't know]

Challenges and limitations in using GenAI for academic purposes

- What difficulties or problems do you encounter when using GenAI?
  - Generated information may be wrong
  - Difficulty interpreting generated information
  - The privacy of transferred data is questionable
  - Subscription fees for more advanced services
  - Technical barriers
  - Lack of compliance with academic requirements
  - Other: _____
- What ethical issues concern you most when using GenAI?
  - Plagiarism
  - Lack of self-reliance
  - Distortion of content (bias, hallucinations, oversimplification)
  - Lack of transparency of sources
  - Other: _____
- Do you think academic institutions should regulate the use of GenAI? [Response scale: Yes | No | No opinion]

Impact of GenAI Use on Skill Development

- Can the use of GenAI foster critical thinking skills? [Response scale: 1 – *No impact* to 5 – *Strong impact*]
- Do you think GenAI may weaken self-reliance in learning? [Response scale: 1 – *No impact* to 5 – *Severely weakens self-reliance*]

Institutional support and university policies

- Does your university provide guidelines or training related to GenAI? [Response scale: Yes | No | I don't know]

Future perspectives

- Do you think proficiency with AI tools will become a key competence in the labour market? [Response scale: Yes | No | No opinion]
- What regulations, if any, should academic institutions introduce regarding GenAI? _____
- What changes, if any, would you like to see in the way GenAI is integrated into education?

Tajna broń? Generatywna sztuczna inteligencja w rękach studentów: szanse i wyzwania

Abstrakt

Cel/Teza: Artykuł analizuje szanse i zagrożenia wynikające z wykorzystania generatywnej sztucznej inteligencji z perspektywy studentów polskich uczelni wyższych.
Koncepcja/Metody badań: W badaniu zastosowano metodę sondażu diagnostycznego w formie ankiety internetowej przeprowadzonej wśród studentów wybranych polskich uczelni.
Wyniki i wnioski: Wyniki badań ujawniły powszechną adopcję GenAI w środowisku akademickim, przy jednoczesnym deficycie wiedzy studentów w zakresie efektywnego i odpowiedzialnego korzystania z tych narzędzi oraz braku spójnych regulacji uczelnianych.
Oryginalność/Wartość poznawcza: Artykuł wypełnia lukę badawczą w polskim kontekście i oferuje praktyczne rekomendacje dla instytucji edukacyjnych oraz decydentów polityki edukacyjnej.

Słowa kluczowe

Adopcja technologii. Edukacja. Generatywna sztuczna inteligencja. Szkolnictwo wyższe. Studenci. Sztuczna inteligencja.

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Each manuscript is reviewed by two referees, selected on the basis of necessary expertise in the subject area under review. The review report is based on standard form containing a statement whether the manuscript is recommended for publication. Criteria for acceptance include appropriateness to the field of the Journal, scientific merit, proper text organization and correct language use.

The final decision about publication of manuscript will be sent to Author within 10 weeks after text submission. Manuscript should be formatted according to guidelines listed below and submitted via the OJS platform: ojs.sbp.pl/index.php/zin

1. General guidelines

1.1. Format

All files should be submitted in RTF (Rich Text Format) files, including text and illustrative content. All pages must be typed and 1.5 spaced using 12-point Times New Roman font. The title of the manuscript should be typed 14-point font. Please do not use any preformatted styles.

Illustrative content inserted in the article, should be send also in JPG format. Attachments should be numbered in order of occurrence and include the title, for example: *1. Tab. 1. List...* or *3. Fig. 1. System....*

1.2. Extent

Manuscript should be no longer than 40,000 characters (including spaces), review and report no longer than 14,000 characters.

1.3. Title page

Authors should prepare **separate title page**, which include:

- **title of the paper,**
- **the name(s) of the author(s) with appropriate affiliations and the ORCID numbers,**
- **the e-mail address of the corresponding author,**
- **address for correspondence,**
- **biographic note (see below),**
- **structured abstract (see below),**
- **keywords (see below),**
- **statement of originality (see below).**

According to the Journal policy against *ghostwriting* and *guest authorship*, authors are requested to list on title page names and affiliations of each person that contributed to the text (author of the idea, methods, etc. used in the submitted manuscript; percentage of contribution to the research process and text compilation). Authors are also requested to describe sources of founding that have supported the work and the financial involvement of research institutes, associations and other entities (*financial disclosure*).

1.4. Author(s) biographic note

Title page should include concise biographic notes (about 70 words) of each author : academic degree or professional position, current place of work and position, area of interest, the most important publications (max. 3).

1.5. Structured abstract

An abstract (about 100 words or 1000 characters) should be included with each submission and placed on the title page. Abstract should be formatted according to categories listed below. Author should identify at least four mandatory sections:

- **Purpose/Thesis** *(mandatory)*
- **Approach/Methods** *(mandatory)*
- **Results and conclusions** *(mandatory)*
- **Research limitations** *(optional)*
- **Practical implications** *(optional)*
- **Originality/Value** *(mandatory)*

1.6. Keywords

Title page should include keywords (4 to 10) as a noun phrases in singular form, where first element is capitalized. Keywords in alphabetical order should be delimited by full stop.

1.7. Statement of originality

Author(s) should include on title page statement that submitted text has not been published before and is not under consideration for publication anywhere else. If the paper was presented at a scientific meeting, provide detailed information about the event and the conference proceedings. If the paper will be the part of the author's book, provide its details and planned publishing date.

2. Manuscript format and preparation

2.1. Body of the paper

The text should be organized into entitled sections and subsections. Text should start with **Introduction**, giving an overview and stating the purpose and end with **Conclusion**, giving the summary of the author contributions to the study.

Author may use three levels of headings. Each heading should have its own title and number according to the following pattern:

1. First-level heading
1.1. Second-level heading
1.1.1 Third-level heading

2.2. References

Bibliographic citations are not allowed in footnotes. The reference list should be prepared according to APA 6-th Edition citation style (see below). Footnotes can be used only to give additional information or commentary. Footnotes to the text are numbered consecutively with Arabic numerals. It is recommended to limit the amount of footnotes per page.

2.3. Titles in the body of the text

Titles of exhibitions, conferences, programmes, etc should be written within double quotation marks. Use italics for publication titles (books, journals, papers, etc.).

2.4. Emphasis

Bold face should be used to emphasize certain words or passages.

2.5. Illustrative content

All illustrations (tables, charts, figures etc.) should be converted to greyscale. All illustrations should be cited in the text properly to their form (Table, Figure, Photograph, etc.) and have title and consecutive number (e.g. Tab. 1. Metadata levels). Use abbreviation in the text when refereeing to the illustrative content (e.g. see Tab. 1, see Fig. 5).

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Use APA 6-th Edition as a citation and reference list format. The references list should only include works that are cited in the text.

Cite references in the text by name of the author(s) and year of publication in parentheses: (Name, Year of

publication), eg. (Dembowska, 1991). If there are two authors, put their names with ampersand (&) mark between: (Name & Name, Year of publication), eg. (Cisek & Sapa, 2007). If there are more than two authors, put the name of the first one followed by abbreviation *et al.*: (Name et al., Year of publication), eg. (Berners-Lee et al., 2001). Edited books are cited by the name(s) of the editor(s) followed by abbreviation *ed(s).*: (Name, ed., Year of publication), eg. (Bellardo Hahn & Buckland, eds., 1998). If there is no author or editor information, put the first word from the title and the year of publication : (Word, Year of publication), eg. (Biblioteki, 1976). Use the following pattern when referring to specific pages in the cited publications: (Dembowska, 1991, 15) or (Cisek & Sapa, 2007, 40–42) or (Bellardo Hahn & Buckland, eds., 1998, 18).

Place the reference list at the end of the text under the heading **References**. Reference list should be in alphabetical order without numbering.

List the references (books and journal articles) in alphabetical order by authors' last names. Citations of edited books list under the name of editor followed by abbreviation Ed.. If there is no author or editor information, list the publication under the first word from the title.

Use italics for book titles and regular font for titles of papers and book chapters. Use abbreviation In: when referring to book chapters in citations.

If there are two or more items by the same author(s), list them in order of year of publication (reverse date order). If two or more works are by the same author(s) within the same year, list them in alphabetical order by title and distinguish them by adding the letters a, b, c, … to the year of publication:

Dembowska, M. (1976a) ....

Dembowska, M. (1976b) ...., etc.

2.6.1. References List Examples

BOOK

Breslin, J.G., Passant, A., Decker, S. (2009). *The Social Semantic Web*. Berlin: Heidelberg: Springer Verlag.

Dembowska, M. (1991). *Nauka o informacji naukowej: organizacja i problematyka badań w Polsce.* Warszawa: IINTE.

BOOK (EDITED)

Bellardo Hahn, T., Buckland, M., eds. (1998). *Historical Studies in Information Science*. Medford, NJ: Information Today.

Biblioteki (1976). *Biblioteki publiczne województwa toruńskiego: informator*. Toruń: Wojewódzka Biblioteka Publiczna i Książnica Miejska im. M. Kopernika.

JOURNAL ARTICLE

Osińska, V. (2010). Rozwój metod mapowania domen naukowych i potencjał analityczny w nim zawarty. *Zagadnienia Informacji Naukowej*, 96(2), 41–51.

Dervin, B., Nilan, M. (1986). Information Needs. *Annual Review of Information Science and Technology*, 21, 3–31.

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Rayward, W.B. (1998). Visions of Xanadu: Paul Otlet (1868-1944) and Hypertext. In: T. Bellardo Hahn & M. Buckland (eds.). *Historical Studies in Information Science* (65–80). Medford, NJ: Information Today.

ELECTRONIC JOURNAL ARTICLE

Berners-Lee, T., Hendler, J., Lassila, O. (2001). The Semantic Web. *Scientific American* [online], May, [30.06.2013], http://www.scientificamerican.com/article.cfm?id=the-semantic-web

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Miller, H. (2013). Big-Data in Cloud Computing: A Taxonomy of Risks. *Information Research* [online], 18(1), [15.07.2013], http://informationr.net/ir/18-1/paper571.html

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Psychology of Culture Contact (1926). *Encyclopaedia Britannica*, Vol. 1, 13th ed. (765–771). London and New York, NY: Encyclopaedia Britannica.

Iluminatorstwo (1971). *Encyklopedia Wiedzy o Książce* (911–952). Wrocław – Warszawa – Kraków: Zakł. Narod. im. Ossolińskich.

Big Data (2013, November 12). *Wikipedia, The Free Encyclopedia* [online] [12.11.2013], http://en.wikipedia.org/w/index.php?title=Big_data&oldid=581347727

Article in encyclopedia with author information describe as book chapter.

ELECTRONIC DOCUMENT FROM WEBSITE

MNiSW (2011). *Narodowe Centrum Nauki w Krakowie. Nadchodzi czas nauki* [online]. Ministerstwo Nauki i Szkolnictwa Wyższego, [15.07.2013], http://www.nauka.gov.pl/?id=2268

Smith, B. (2004). *Ontology and Information Systems* [online]. The Buffalo University, Department of Philosophy, [15.07.2013], http://ontology.buffalo.edu/ontology.doc

US NLM (2004). *Medical Subject Headings* [online]. US National Library of Medicine. National Institutes of Health, [15.07.2013], http://www.nlm.nih.gov/mesh/meshhome.html

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