

Systematic Review

# An Inclusive Workplace Approach to Disability through Assistive Technologies: A Systematic Review and Thematic Analysis of the Literature

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**Abstract:** To explain the low employment rates of people with disabilities (*PwDs*), emerging debates have revealed an unexploited potential impact of assistive technology (AT) on human talent and the inclusion process. This article provides a systematic review to critically evaluate the current trends in the literature on AT. A systematic review was performed according to the inclusion criteria of the PRISMA-S guidelines, followed by a thematic analysis identifying the main themes by which the literature on the subject is organized. Finally, the Human Activity Assistive Technology (HAAT) model was used to deepen the contents taken into consideration in the scientific literature and to discuss the concept of workplace inclusion and its use. Forty-one studies fully met the eligibility criteria of the systematic review. The thematic analysis produced four clusters related to the impact and characteristics of AT in the workplace. Overall, the use of the HAAT model highlighted a lack of studies on the affective and socio-cultural dimensions that characterize the use of AT in the workplace. It is concluded that the deployment of AT can and should work on multiple levels to shape the workplace experiences of *PwDs*.

**Keywords:** disability; employment; assistive technologies; workplace; social inclusion



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## 1. Introduction

The most recent dataset produced by Eurostat, “Disability employment gap by level of activity limitation and sex” [1], showed a disability employment gap of 23.1% in 2021 and suggested a relatively stable trend for the years 2014–2021 in the 27 member states of the European Union (EU). The estimates of people with disabilities (from now on we will use the acronym *PwDs*) indicated that 16.1% of the population outside the labor force was inactive and not seeking employment due to their own illness or disability, whereas the estimated percentage of the population who were inactive due to care of adults or children with disabilities was 11.4% [2]. Among those aged 16 or over without any limitations to activity, 19.8% were at risk of poverty or social exclusion, as were 30.6% of those with some or a severe level of activity limitation [3].

The activity limitations account for all forms of disabilities and were built upon a common reference framework by the International Classification of Functioning, Disability and Health (ICF), and its later amendments, which have systematically appraised the list of activities that would best describe an individual’s limitations in performing tasks and identified the restrictions to one’s participation in everyday life [4].

Bringing forward this long-standing model of disability and analyzing the complexity of the environmental influence on an individual’s capacity and performance, the most recent

recommendations from the European Disability Forum (EDF) conveyed that the ongoing development of artificial-intelligence-based applications and systems may allow us to envision its use in education and employment and ensure that *PwDs* enter the mainstream of accessibility [5,6]. Through the lens of inclusion, the use of assistive technology (AT) in the workplace will combine artificial intelligence (AI), virtual and augmented reality, robotics, and smart environments [7]. In the above terms, it appears that the actual or potential benefits, along with harms, for *PwDs* will rely on available, affordable, procedural, and infrastructural features of technologies which may be used in the living domains of communication, mobility, and information [8].

Understanding the limitations to activity and overcoming them with AT in the workplace is also relevant in light of the human right to work, affirmed in article 27 of the United Nations Convention on the Rights of Persons with Disabilities [9]. The latter received formal confirmation by the EU in 2010 and it remains under implementation, underlying the strategy plan of the Union of Equality 2021–2030 [10].

In 2017, the World Health Organization (WHO) released a report outlining a global agenda and the research priorities that were endorsed throughout the global research, innovation, and education in assistive technology (GREAT) summit. The main objects of the proposal were focused on the accessibility of high-quality and affordable AT, namely, any external product (including devices, equipment, instruments, or software), the primary purpose of which is to maintain or improve an individual's functioning and independence, and thereby promote their well-being [11].

#### *Human Activity Assistive Technology (HAAT) Model*

An important premise of our paper is our concept of disability, which refers to the so-called third generation of conceptual models. It is more holistic and gives more weight to environmental aspects [12]. With the promotion of universal methods and the development of sustainable solutions with technology usage among *PwDs*, we have now reached a point where digital solutions have shown promising results, along with some limitations [13–15].

Assistive technology (AT) is any item, piece of equipment, software program, or product system that is used to increase, maintain, or improve the functional capabilities of persons with disabilities [16]. The effectiveness, use, and deployment of these emerging technologies in traditional AT systems have extensively informed the mechanisms of inclusion in the workplace, social equality, and general health [17].

Both the access to and the misuse of traditional and emerging assistive technologies may reflect some of the biggest challenges in policymaking and research while considering the inequity of access to digital products and services [18].

A theoretical framework that can be useful in choosing and implementing an AT is the Human Activity Assistive Technology Model (HAAT) by Cook and Hussey [19]. The model was inspired and developed in parallel with the ICF and other important models in occupational therapy.

The HAAT, in summary, describes the person carrying out an activity in a context using AT. Therefore, the components of the model are the *activity*, the *human*, the *AT*, and the *context*. AT is the focus of this model, but it cannot be considered independently of the other components. Specifically,

- The *activity* component assists in the understanding of the tasks in which the user of the AT participates. It starts from the premise that the person can engage in several activities simultaneously and that the engagement in the activity is a dynamic process; it also includes temporal aspects of the duration and frequency of participation in the activity (e.g., several times a day, weekly, monthly, and seasonal) and the possible implication to other people. Overall, the activity component is categorized into the following three basic areas of performance: activities of daily living, work and productive activities, and play and leisure.
- The *human* component includes the user's motor, sensory, cognitive, and affective abilities. The function of these essential elements is understood in terms of their

ability to support and carry out the desired and necessary tasks enabled by AT. At the base of this component is the prediction of a change in skills. The human abilities of the person using the AT are categorized into the following three basic areas of performance: physical, cognitive, and affective.

- The *context* component distances itself from the medical model by shifting the localization of the disability out of the person and into the social structures. It is a social model of disability that makes the contextual aspects of AT design, service delivery, and use explicit and relevant. Four contextual components are included: (1) physical context, including natural and built surroundings and physical parameters; (2) social context (e.g., with peers and with strangers); (3) cultural context, understood as systems of shared meanings [20,21], which include beliefs, rituals, and values widely diffused in the reference context; and (4) the institutional context (including formal legal, legislative acts, regulations, policies, and practice and procedures at other institutional levels, such as educational, work, organizational, and community settings). The context in which the device is used is classified into the following four basic areas of performance: physical, social, cultural, and institutional.
- The *AT* component is seen as an enabling factor for a human entity carrying out an activity in the given context. The interaction with the human component takes place through the human/technology interface, which forms the boundary between the human and the AT. A bidirectional exchange occurs at this boundary (i.e., information and forces are directed from humans to technology and vice versa). The AT is classified into the following basic areas of performance: processor, environment sensor, and activity output.

In reference to the ICF, the phenomenon of AT deepens the individual's occupation, providing a better understanding of AT's potential to enable participation and not just the ability to perform an activity.

AT plays an important role in the recovery or improvement of the functionality of people with disabilities (*PwDs*). The rates of abandonment and/or non-use of AT devices are high for many reasons and the Human Activity Assistive Technology (HAAT) model proposes to understand the role played by AT in the lives of people with disabilities. It briefly describes "someone (human) doing something (activity) in a context using assistive technology". Thus, during the process of preparing and/or indicating an AT resource or device, it is important to understand the activity that the person wants and needs to perform, the capacities they have, and the different aspects of the context that will influence their acquisition and use. Several studies have highlighted the importance of patient/user participation in the development of AT resources or devices, or in the process of defining and choosing the device that best suits their needs and of training and updating the team to evaluate and monitor the AT use [22].

## 2. Rationale and Research Answers

The purpose of this review is to explore the state-of-the-art research in the field of technological innovations that can help people with different forms and severities of disability to be included in the workplace. The study focuses on the following questions:

- (1) How and what technologies are currently being used to facilitate work accommodation for people with disabilities?
- (2) With respect to the use of assistive technologies, is there a differentiation in studies that considers not only the type of disability but also the different levels of severity of the disability?
- (3) In general, how does research on developments in assistive technologies integrate the specificity of the person with the activity they perform and the context in which they work?
- (4) How do policies and ethical principles inform assistive technology research?

### 3. Objectives

Our study focused on how AT, including AI systems, communication, social interaction, and productivity tools, are being offered for the inclusion of vulnerable people in the workforce. In this study, we used an evidence-based approach to the use of AT as it relates to the employment of *PwDs* according to the HAAT model. For this purpose, we analyzed the literature within the technology discourse and critically appraised human rights, policy, and ethics.

To investigate how the legislative changes on the disability policy were reflected by new research, we selected a limited timeframe, retrieving information since 2017, and analyzed the degree of complexity as well as the heterogeneity aspects of the literature. This narrow timeline was corroborated by comparative and socio-political studies of disability [23], and the key policies on inclusive economies, health, and labor market programs [11,24–26].

While there is a large body of literature on the use of AT among people with intellectual disabilities and, more generally, in occupational accommodation for *PwDs*, to date, few studies are available that delve into the use of AT for the inclusion of people with various disabilities while fostering their occupational balance [27].

Specifically, no studies, to our knowledge, have explored multiple levels of disability or categorized the modalities through which AT can work to promote experience and inclusion strategies in the workplace.

This study seeks to fill this gap by providing descriptive data on the different forms of technologies currently used in the field of job placement and workplace accommodations for people with various disabilities. It systematically explores how these have been described and used to foster inclusion in the workplace, and finally considers the different levels of applicability to people's participation.

### 4. Methods

To achieve the objectives of the study, the literature analysis was carried out in three successive steps: systematic review, thematic analysis, and theoretical analysis.

#### Step 1—*Systematic review*

First, a systematic review was conducted following the study eligibility criteria of the PRISMA-S guidelines [28].

##### 4.1. *Search Criteria*

The literature search was performed in September 2023. Articles were selected from the following databases: EBSCO, ProQuest, PsychINFO, Pubmed, Scopus, and Web of Science. Preliminary search terms included disability, technology, assistive technology, assistive tools, workplace, workplace accommodation, workplace accessibility, occupation, employment, and inclusion. The database search also used synonyms for keywords or words with related meanings, including a gray literature search from Google Scholar.

The time range of the selected articles was limited to the last seven years (2017 to mid-2023), because of changes in research and key policies, as indicated above. The open-source reference management software Zotero was used to cite and manage the data collected and to detect duplicates [29,30].

##### 4.2. *Selection of Studies*

The selected studies included articles related to technology and workplace inclusion for *PwDs*.

The studies were chosen according to the following inclusion and exclusion criteria.

Inclusion criteria:

Studies that included technology in the contexts of disability and work inclusion.

Exclusion criteria:

- Studies that dealt with the application of technology in the context of daily life;
- Studies concerning post-secondary transition programs for young people with disabilities;
- Studies with a focus on the general population;
- Studies in which technology was absent;
- Vocational guidance studies;
- Book chapters and conferences.

#### 4.3. Process of Identification of Relevant Studies and Data Extraction

Next, the Zotero library was uploaded to the online review software Rayyan [31]. In parallel, potential documents were reviewed by title/abstract/keywords by three independent reviewers (L.C., M.N., and G.M.). A fourth reviewer (M.M.) helped resolve any disagreements on the selection of each study. The final decision was based on the predetermined criteria of selection.

##### Step 2—Thematic analysis

Secondly, a thematic analysis of the selected title/abstract/keywords was performed through the T-LAB Plus 2021 software. The software allows for the application of a content analysis methodology that enables the quantitative classification of qualitative information contained in the text [32]. It applies statistical analyses based on a textual database containing the needs occurrences and needs co-occurrences of words. The use of software can be considered a compromise between statistical synthesis, the hermeneutics of the text, the sensitivity of the researcher, and analysis of the context [33,34].

The T-Lab software also enables the user to follow various paths of the thematic analysis; in this case, we performed a thematic analysis of elementary contexts. Hence, bottom-up clustering provides a representation of the contents of the corpus through a specific number of meaningful thematic clusters. Each cluster consists of a set of elementary contexts (e.g., sentences or paragraphs) characterized by the same keyword patterns, which correspond to relatively homogeneous topics, and is described through the lexical units (i.e., words, lemmas, or categories) that are the most characteristic elements of the context units from which it is composed [35,36]. Overall, the analysis results can be considered as an isotopic map (iso = same; topoi = places) where each cluster, as a generic or specific theme [37], is characterized by the co-occurrence of semantic traits [35]. Operationally, it results from the construction of a contingency table “words × clusters”, while the chi-squared test is applied to all the intersections in the contingency table itself.

##### Step 3—Theoretical analysis

Finally, the theoretical model HAAT was used to explore and organize the workplace inclusion criteria used by the reference literature in relation to the model components (activity, human, and context) and the respective basic areas of performance (activity: daily living, work and productive activities, play and leisure; human: physical, cognitive, affective; context: social, cultural, and institutional). The technology component, namely, the subject of the article selection criteria, was excluded from the total scores.

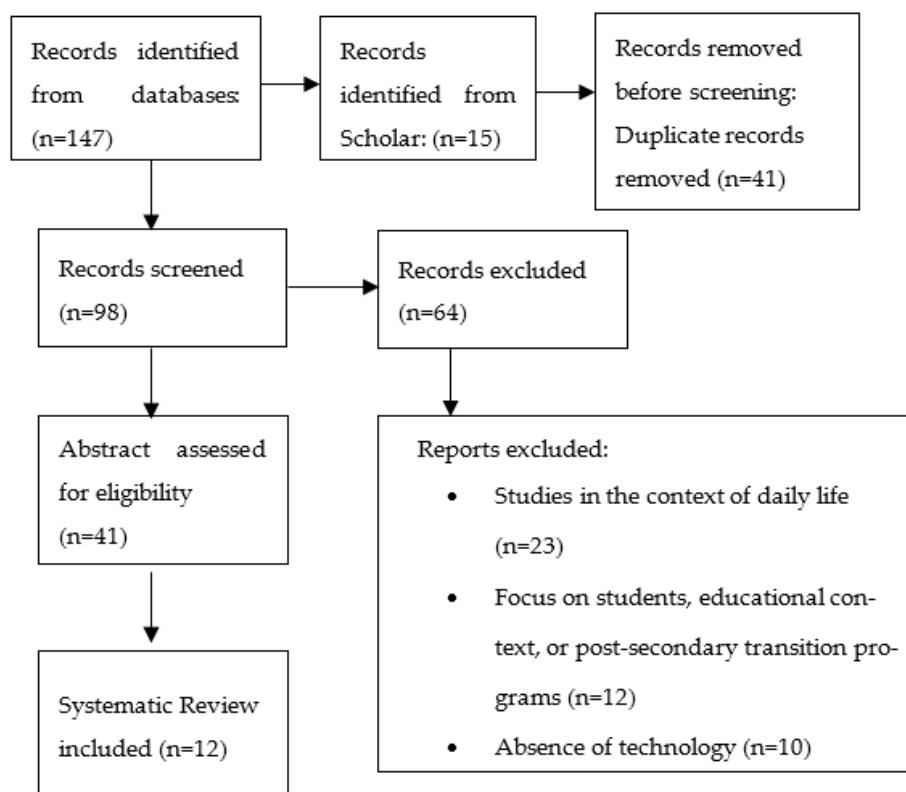
To minimize reporting biases, two independent reviewers thoroughly reviewed the full-text articles and assigned scores. An assessment of the selected full-texts was also included to deal with the inconsistency between abstracts and full-texts [38], as well as to inform on the decision-making from abstracts of the included systematic reviews [39].

Hence, a summary table was developed to systematize the selection of studies and to apply the model in terms of the presence/absence of each component. When one of the basic performance areas appeared in the article as the subject of discussion and analysis, it was scored 1 (presence), otherwise, it was scored 0 (absence). The judges' agreement on each article determined which score was assigned to each performance area; when there was even partial disagreement between the judges, the article was assigned a value of 0. The achievable score ranged from 0 to 10.

## 5. Results

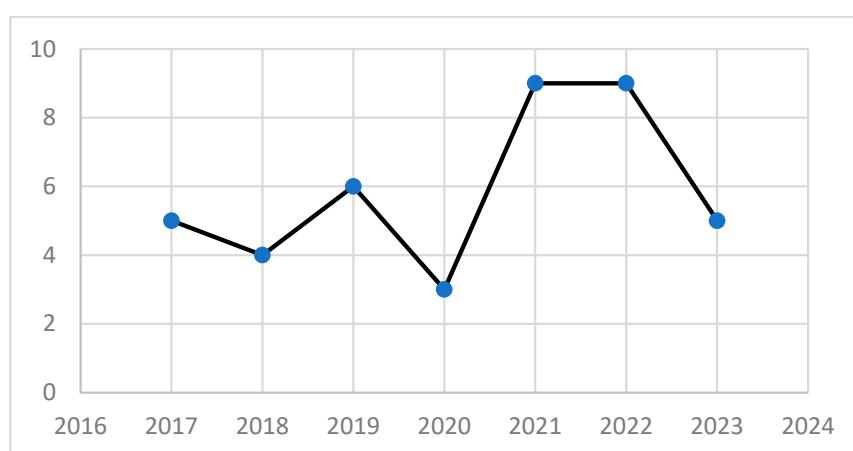
### 5.1. Systematic Review (Step 1)

The complete description of the flow process is presented in Figure 1. In total, 146 articles were identified, of which 131 were identified in the EBSCO, ProQuest, PsychINFO, Pubmed, Scopus, and Web of Science databases and 15 in Google Scholar. Of these, 41 were excluded because they were duplicates. Of the remaining articles, 98 were screened records and 41 studies were considered eligible. In total, we identified 12 systematic reviews.



**Figure 1.** Flow diagram of the study selection process. Note: adapted from “The PRISMA 2020 statement: An updated guideline for reporting systematic reviews” [40].

Compared to the time interval considered (2017 to September 2023), our research identified an increase in publications from 2021 onwards (Figure 2), with a stable trend in 2022 and probably also in 2023 (five publications in the year still to come).



**Figure 2.** Number of publications between 2017 and 2023.

Regarding the main objectives stated in the publications: five referred to workplace accommodation (WA), i.e., the use of AT to support employees with disabilities to perform their job tasks effectively; nine to work inclusion and social participation (WI/SP), i.e., the use of AT to foster initiatives to support the active participation of people with disabilities in the work context, promoting a participatory environment of collective well-being; four to environmental modifications (EMs), i.e., adaptations to the work environment that the use of AT enables to people with disabilities to carry out their tasks; one to seeking employment (SKE), i.e., AT as a tool to facilitate access to the labor market; and one to financial performance (FP), i.e., technological innovation as a tool to facilitate the performance of business activities in relation to employee disability. The forms of disability investigated were intellectual and developmental disabilities (IDD), in 13 cases, including autism spectrum disorder (ASD); physical disabilities (PD), including blind workers (BW), in 9 cases; dementia (DE) in 2 cases; mental illness (MI) in 1 case; and disability (any type of diagnosis or disability; DIS) in 16 cases. A total of 13 out of 41 publications (approximately 32%) were detected as not having sufficient data regarding the severity of the disabilities at which the publication was aimed. Indication on the severity of disability was either ignored or missing for those included studies.

In most of the articles, technology (see Table 1) was conceived as a useful tool for performing a task [41–58] and/or for the reduction of a physical [41,42,45,47,53,55,59,60], cognitive [43,44,48,49,54,56,61–65], or mental health [66] accommodation/participation [48,50–52,54,56,57,60,64,65,67–75] and the social inclusion [59,61–63,70,72] gap. Only a few cases discussed the impact of technology use on financial issues [76], employment inclusion [70], identity [67,77], self-determination/empowerment [43,78–80], and ethical issues [81]. The different forms concerned the use of AT as mobile support tools [42,47,51,61,65,66], cognitive assistance systems [41,43,44,70], apps or technological devices [49,53,65,66,74], robotics [45], brain-computer interface [55], social media [69,80], eHealth [68], information and communication technologies (ICTs) [52,63,78,79], and virtual reality (VR) [59,71,72,77].

### 5.2. Thematic Analysis (Step 2)

The thematic analysis of the elementary contexts allowed us to identify four clusters characterized by specific word patterns, namely, the lemmas. Here, lemmas were detected on the highest chi-square values, while the percentage of variance was explained and shown by lemmas for each cluster (Table 2).

The first cluster (social impact of technology) is related to the impact of technology on social life (experience, world, virtual, communication, influence), identity (woman, identity, young, discrimination), and employment (workforce, working) of persons with disabilities (dementia, early onset). The second cluster (political impact of technology) is characterized by the focus on policies (policy, literature, provision, domain, age, product, peer) of workplace accommodation (job accommodation, environmental, workplace accommodation). The third cluster (instrumental use of technology) looks at the instrumental use of technology (robot arm, model, eHealth, tool, technological innovation) in the various spheres of employment (worker, financial, employee, disability, sector, performance, assistive). The last cluster (areas of insistence) refers to intervention areas (setting, employment-related, outcome, effects, benefit, universal) in the use of technology for people with different types of disability (people with intellectual dementia).

### 5.3. Theoretical Analysis (Step 3)

Using the HAAT model for our theoretical analysis suggested how the technology research tended to be explored and studied separately when it comes to the life spheres of *PwDs*, namely, the domains of activities and human abilities, as well as the context (Table 3). The included articles that we found in step 1 were mainly focused on workplace accommodation (18 articles), but they may have ignored one or more components.

**Table 1.** Characteristics of included studies.

Author/Year	Authors' Countries of Affiliation	Aim/Purpose of the Article	Type of Article	Target of Study	Indications of Severity	Outcomes	Type of Technology
Albulayhi, 2022 [41]	Saudi Arabia	To describe the approach to suit the nature of the subject by studying the causal correlation to develop a causal model of the relationship between the effectiveness of training programs and assistive technology and the dimensions of the working environment in workers with visual impairment.	Research article	BW	No	WA	AT (Cognitive Assistance System)
Babu and Heath, 2017 [42]	USA	To explore the potential of mobile assistive technology (MAT) as a vocational tool for blind workers (BW). To investigate the employment experiences of adults who acquired disabilities mid-career and who use AT for daily living, with a focus on people who use AT for mobility and/or communication.	Case study	BW	No	WA	AT (Mobile Assistive Technology)
Beneteau et al., 2023 [67]	Seattle, WA, USA	To investigate the impact of technology use on employment-related outcomes for people with intellectual and developmental disabilities (IDD).	Research article	DIS	No	WI/SP	AT
Damianidou et al., 2019 [43]	Australia/USA	To explore the impact of technology use to support employment-related outcomes for people with intellectual and developmental disabilities (IDD) by focusing on the impacts of types of technology and work settings.	Systematic review	IDD	Yes	WA	AT
Damianidou et al., 2018 [44]	Australia/USA	To explore how virtual reality technologies influence work experiences for people with disabilities.	Systematic review	IDD	Yes	WA	AT (Applied Cognitive Technology)
Davis and Chansiri, 2019 [77]	USA	To investigate the approach of using a collaborative robot arm to support people with disabilities in their reintegration into the workplace.	Research article	DIS	No	WI/SP	VR
Drolshagen et al., 2021 [45]	Germany	It is a scoping review of the vocational inclusion of people with disabilities via the technologies described.	Research article	DIS	No	WA	AT (Robots)
Hamideh Kerdar et al., 2022 [46]	Germany	Investigated the potential of ME-IT as a workplace enabler for workers with visual impairments (WVI).	Scoping review	DIS	Yes	WA	AT
Heath and Babu, 2022 [47]	USA	To identify studies combining the concepts of eHealth and work participation for sick-listed employees across diagnostic groups in healthcare and workplace contexts.	Research article	BW	No	WA	AT
Johnsen et al., 2021 [68]	Norway/Denmark	To identify workplace accommodations that can contribute to obtaining or maintaining employment for adults with autism spectrum disorder (ASD).	Scoping review	DIS	No	WA	eHealth
Khalifa et al., 2020 [48]	Canada	To address what was known about technology-based employment interventions for individuals with autism and how these interventions were conducted.	Scoping review	ASD	No	WA	AT
Kim et al., 2022 [49]	South Korea/USA	To explore how employment specialists can use Facebook, Twitter, and LinkedIn to find new opportunities, expand professional networks, and incorporate social media (SM) use into standard practices.	Theoretical-descriptive article	DIS	No	SKE	SM
Kumari and Lenka, 2023 [50]	India	To find assistive technologies that help differently abled people with accessibility in the workplace.	Systematic review	DIS	Yes	WA	AT
Kuo et al., 2023 [51]	USA	To explore the feasibility and preliminary efficacy of a mobile software, availVR by CentralReach, created based on the individual placement and support model for assisting individuals with disabilities to perform their job tasks.	Pilot study	DIS	No	WA	AT

**Table 1.** Cont.

Author/Year	Authors' Countries of Affiliation	Aim/Purpose of the Article	Type of Article	Target of Study	Indications of Severity	Outcomes	Type of Technology
Lackey et al., 2023 [52]	Canada	To identify and analyze barriers and facilitators to implementing workplace accommodations for adults (19 years and over) who use augmentative and alternative communication (AAC).	Systematic review	DIS	Yes	WA	AT (Augmentative and Alternative Communication—AAC)
Lin et al., 2019 [78]	China	To examine how disabled people in China transformed themselves into new self-enterprising subjects in the wave of “internet + disability.”	Case study	DIS	No	WI/SP	ICTs
Lindsay et al., 2017 [79]	Canada	To assess the feasibility of an online peer-mentor employment readiness intervention for youth with physical disabilities and their parents, and improve their self-determination, career maturity, and social support compared to controls.	Research article	PD (Young People)	No	WI/SP	ICTs
Mark et al., 2019 [70]	Italy/Ireland	To examine to what extent the trend towards Industry 4.0 offers potential for the inclusion of people with disabilities in Production 4.0; to examine relevant legal foundations and restrictions in Europe and in greater detail in Austria, Italy, and Norway.	Case study	DIS	No	WA	AT
Martin et al., 2021 [61]	Australia	To investigate how specific aspects of mobile device/app use are associated with the social inclusion of people with intellectual disabilities (ID).	Research article	IDD	No	WI/SP	AT (Device Apps)
McDonnell et al., 2023 [53]	USA	To describe the assistive technology (AT) in employment for people with blindness or low vision (B/LV).	Research article	BW	Yes	WA	AT (Different Tools)
Michalski et al., 2021 [71]	Australia	To synthesize the evidence of virtual environments as a tool to train vocational skills in people with neurodevelopmental disorders (NDD).	Systematic review	IDD	No	WA	VR
Neal et al., 2021 [59]	Netherlands	To synthesize evidence of the effectiveness of digital technologies used by people with dementia to improve self-management and social participation.	Systematic review	DE	Yes	WI/SP	AT/VR
Nicholson et al., 2018 [66]	USA	To examine the feasibility, acceptability, and usefulness of the WorkingWell app as an innovative mobile employment support tool (i.e., for use with a smartphone or tablet) for people with serious mental illness.	Pilot study (protocol)	MI	Yes	EM	AT (WorkingWell Mobile Support Tool)
Oware and Mallikarjunappa, 2021 [76]	India	To investigate technological innovation (TI), employee disability (EDI), and financial performance.	Research article	DIS	No	FP	AT (Technological Innovation)
Owuor et al., 2018 [62]	Ireland/UK/Switzerland	To explore the use of assistive technology to promote community participation or interpersonal relationships (i.e., social inclusion) for people with ID.	Proposal (systematic review protocol)	IDD	No	WI/SP	AT
Padkapayeva et al., 2017 [60]	Canada	To identify and synthesize research evidence on workplace accommodations used by employers to recruit, hire, retain, and promote persons with physical disabilities.	Systematic review	PD	Yes	WA	AT
Paul et al., 2022 [54]	USA	To describe the conduct of a series of focus groups with adults with intellectual and developmental disabilities (IDD) and their family members to explore the use of technology by individuals with IDD in vocational contexts.	Research article	IDD	No	WI/SP	AT (Wireless Technology)
Politis et al., 2019 [72]	Ireland/UK	To discuss the rights to an inclusive society for people with cognitive disabilities and to have access to services and products that meet their specific needs; to encourage the involvement of adults with autism spectrum disorder (ASD) in technological development.	Participatory research/case study	ASD	No	WA	VR

**Table 1.** Cont.

Author/Year	Authors' Countries of Affiliation	Aim/Purpose of the Article	Type of Article	Target of Study	Indications of Severity	Outcomes	Type of Technology
Pouliot et al., 2017 [63]	USA	To provide guidelines for how to develop customized, electronic “communication stories” for young adults with ID/ASD for their use in the workplace.	Theoretical-descriptive article	IDD (Young Adults)	Yes	WI/SP	AT (Communication Stories)
Rahmatika et al., 2022 [73]	Indonesia	To examine various studies regarding the relationship between the provision of assistive technology (AT) and workplace integration for people with disabilities (PWD).	Systematic review	DIS	No	WI/SP	AT
Romo Badillo et al., 2018 [55]	Mexico	To present a proposal for a brain-computer interface (BCI) that, based on a device that captures real-time electroencephalogram (EEG) brainwaves, can make decisions or activities without the need for movement.	Proposal	PD	No	WA	AT (Brain-Computer Interface)
Sacchi, 2022 [56]	Italy	To provide a focused systematic review of 27 studies identified within the literature. Results analyzed the ATs that can be used for supporting the labor market inclusion of persons with autism spectrum disorder, the skills they help to develop, and the work activities they can support.	Systematic review	ASD	No	WA	AT
Selvakumaran et al., 2020 [64]	Canada	To examine environmental factors and conceptualize the impact of a supportive ecosystem on the productivity of youth and adults with neurodevelopmental disorders.	Umbrella review	IDD	No	EM	AT
Shastri et al., 2022 [65]	Canada / Sweden/Finland	To understand the workplace experiences and the role of technology among people living with mild cognitive impairment (MCI) or early onset dementia (EOD).	Participatory research	DE	Yes	WA	AT (Daybook, Phone, iPad, TV Remote Control)
Smith et al., 2017 [74]	USA	To investigate the effectiveness of evidence-based interventions to increase employment for people with various disabilities.	Systematic review	DIS	Yes	WA	AT
Tilmes, 2022 [81]	USA	To describe the ethical issues regarding how the AI vendors have sought to translate normative concepts such as fairness into measurable, mathematical criteria.	Theoretical article	DIS	No	SKE	AI
Washington et al., 2021 [57]	USA	To map and categorize the transdisciplinary literature on environmental modifications and supports for aging adults with intellectual and developmental disabilities (IDD).	Scoping review	IDD (Older Adults)	Yes	EM	AT
Weller, 2019 [58]	Germany	To investigate the influence of computer technology on tasks carried out by employees with disabilities compared to employees without disabilities.	Research article	DIS	Yes	WA	ICTs
Wong et al., 2021 [75]	USA	To identify job accommodations that help persons with physical disabilities (PD) maintain or return to work and explore the barriers and facilitators that influence the provision and reception of job accommodations.	Systematic review	PD	Yes	WA	AT
Zheng et al., 2020 [80]	China	To understand how disabled women counter stereotypes and cope with adversity in the workplace and in their social lives, and to explore how the internet economy facilitates the economic and social inclusion of disabled women.	Case study	PD (Disabled Women)	Yes	WI/SP	SM

**Target of study**—PD = physical disabilities; DIS = disability (any type of diagnosis or disability); ASD = autism spectrum disorder; MI= mental illness; DE= dementia; BW= blind workers; NDD = neurodevelopmental disabilities; ID = intellectual disabilities; **Outcomes**—WA = workplace accommodation WI/SP = work inclusion/social participation; EM = environmental modifications (work); SKE= seeking employment; FI= financial performance; VW= virtual worlds; **Type of technology**—AT = assistive technology; SM = social media; ICTs = information communication technologies; VR = virtual reality; TI = technological innovation; AI = artificial intelligence.

**Table 2.** Salient words in thematic clusters of the analyzed texts.

THEME 1 (Social Impact of Technology)	$\chi^2$ Theme 1	THEME 2 (Political Impact of Technology)	$\chi^2$ Theme 2	THEME 3 (Instrumental Use of Technology)	$\chi^2$ Theme 3	THEME 4 (Areas of Insistence)	$\chi^2$ Theme 4
	16%		22%		31%		31%
Woman	43.39	Physical	44.63	Robot Arm	21.22	Technology	50.53
Experience	33.28	Policy	35.31	Worker	19.62	People With	36.75
Workforce	32.52	Literature	29.06	Model	18.86	Intellectual	31.66
Communication	31.49	Job Accommodations	26.59	eHealth	18.71	Setting	27.12
World	26.50	Youth	25.66	Tool	18.11	Employment-Related	24.85
Identity	26.19	Provision	22.44	Financial	16.50	Type	17.16
Virtual	25.51	Environmental	20.60	Technological Innovation	16.50	Outcome	14.55
Young	21.67	Domain	17.93	Employee Disability	14.14	Effects	14.32
Discrimination	21.67	Age	17.39	Sector	14.14	Difference	13.53
Working	16.71	Workplace Accommodations	17.39	Performance	13.82	Benefit	13.53
Influence	16.61	Suggest	16.02	Collaboration	11.78	Universal	13.53
Early Onset Dementia	16.61	Categorize	16.02	Assistive Technology	11.78	Original	11.28
Carry out	15.77	Product	16.02	Issue	11.78	Area	11.28
Adult	14.45	Peer	14.81	Innovation	11.78	Associate	11.28
Impairment	13.67	Accommodation	13.88	Manufacture	11.78	Dementia	11.07

**Table 3.** Theoretical insight into the inclusion criteria.

Reference Number	Activity				The Human					The Context			Technology Concept Applied to Work	Total
	DAILY LIVING	WORK AND PRODUCTIVE ACTIVITIES	PLAY AND LEISURE ACTIVITY	PHYSICAL	COGNITIVE AFFECTIVE	PHYSICAL CONTEXT	SOCIAL CONTEXT	CULTURAL CONTEXT	INSTITUTIONAL CONTEXT					
[41]	0	1	0	1	0	0	1	0	0				There is a positive correlation between the work environment and its dimensions, the effectiveness of training programs, and the assistive technology of workers with visual impairment. The proposed model achieves high suitability indicators with its various components in its interpretation of the relationships between the work environment and the effectiveness of training programs, and assistive technology for workers with visual impairment.	3
[42]	0	1	0	1	1	0	1	1	0				Mobile assistive technology to increase blind workers' job fit, performance, self-reliance, and managerial perceptions on employability.	5
[67]	1	1	1	1	0	0	1	1	0				Assistive technologies for mobility and/or communication, such as augmentative alternative communication (AAC) systems and crowdsourcing	6
[43]	0	1	0	0	1	0	1	1	0				Applied cognitive technology to support people with intellectual and developmental disabilities to accomplish employment-related outcomes.	4
[44]	0	1	0	0	1	0	0	1	0				Effects of the technology use between pictorial prompts and auditory prompting devices, desktop and laptop computers, palmtops, and real and simulated work environments.	3
[77]	0	1	0	0	1	1	1	1	1				Virtual identity on work opportunities for people with disabilities.	7
[45]	0	1	0	1	0	0	1	0	0				Industrial robot arm in a sheltered workshop for people with disabilities.	3
[46]	0	1	0	1	0	0	1	0	0				The results of a project are reported based on a protocol for disability, technology, and tasks.	3

**Table 3.** Cont.

Reference Number	Activity			The Human				The Context			Technology Concept Applied to Work	Total
	DAILY LIVING	WORK AND PRODUCTIVE ACTIVITIES	PLAY AND LEISURE ACTIVITY	PHYSICAL	COGNITIVE	AFFECTIVE	PHYSICAL CONTEXT	SOCIAL CONTEXT	CULTURAL CONTEXT	INSTITUTIONAL CONTEXT		
[47]	0	1	0	1	0	0	1	1	0	0	Findings extend the literature on the use of mobile technology in the workplace, contextually aware computing, and assistive technology, and invites additional work to calibrate ME-IT to specific jobs, job contexts, and the needs of users.	4
[68]	0	1	0	1	0	0	1	0	0	0	eHealth interventions to facilitate work participation.	3
[48]	0	1	0	0	1	0	1	1	0	0	Technology as products to improve work performance and gain experience.	4
[49]	0	1	0	0	1	0	1	0	0	0	Use of phones/tablets and other technological devices for video modelling and/or for prompting, or alongside cueing and feedback.	3
[69]	0	1	0	0	0	0	1	0	0	0	Use of Facebook, Twitter, and LinkedIn as social media platforms for supporting employment.	2
[50]	0	1	0	1	1	0	1	1	0	1	Use of assistive technology to help disabled people find and maintain employment.	6
[51]	0	1	0	1	1	0	1	0	0	0	A software application available on both Apple iOS and Android mobile devices, Avail, helps individuals with disabilities perform their job tasks via picture/video/audio/text prompting systems.	4
[52]	0	1	0	1	1	0	1	1	0	0	Identify and summarize the barriers and facilitators for implementing workplace accommodations for adults who use augmentative and alternative communication (AAC).	6
[78]	0	1	0	1	0	1	1	1	1	1	The structure context that shapes the relationships between technology use and disability.	7
[79]	0	1	0	1	0	0	1	1	0	0	Methodology designed to develop and evaluate an online employment readiness intervention for youth with disabilities.	4
[70]	0	1	0	1	1	0	1	1	0	1	Technological possibilities for research and industry to include people with disabilities in production.	6
[61]	0	1	1	0	1	0	1	1	0	0	Mobile devices/apps to help workers/volunteers on a disability pension scheme to get in touch and to make new friends.	5
[53]	0	1	0	1	0	0	1	1	0	0	Use in the workplace to implement skills and job satisfaction levels.	4
[71]	0	1	0	0	1	0	1	1	0	1	Training in virtual environments to help individuals with neurodevelopmental disorders improve vocational skills.	5
[59]	0	1	0	0	1	0	1	1	0	0	To facilitate social participation and self-management.	4
[66]	0	1	0	1	1	0	1	0	0	0	Use of WorkingWell mobile support tool for individuals with serious mental illnesses.	4
[76]	0	1	0	1	1	0	0	0	0	1	Use of technology innovation and employee disability (EDI) to improve the financial performance (return on assets and return on equity) of firms.	4
[62]	1	1	0	0	1	0	1	1	1	1	The use of various technological resources to support people with intellectual disabilities to obtain behavioural and social benefits and to reduce the negative impact of their disabilities on their well-being and community participation.	7
[60]	0	1	0	1	0	0	1	1	0	0	Physical/technological modifications to enhance workplace flexibility and autonomy of a worker.	4
[54]	0	1	0	0	1	0	1	1	0	0	Four major themes emerged from the analysis: participants' wireless/wearable technology use, benefits and facilitators of technology use at work, barriers and challenges to technology use at work, and expectations for and outcomes associated with technology supports in the workplace.	4

**Table 3.** *Cont.*

Reference Number	Activity			The Human				The Context			Technology Concept Applied to Work	Total
	DAILY LIVING	WORK AND PRODUCTIVE ACTIVITIES	PLAY AND LEISURE ACTIVITY	PHYSICAL	COGNITIVE	AFFECTIVE	PHYSICAL CONTEXT	SOCIAL CONTEXT	CULTURAL CONTEXT	INSTITUTIONAL CONTEXT		
[72]	0	1	0	0	1	0	1	1	0	0	Use of a virtual world for communication skills training of young adults with autism.	4
[63]	0	1	0	0	1	0	0	1	0	0	Communication stories “to teach young adults” communication partners about the expressive, receptive, and social/pragmatic language strategies they use. “Communication stories” are easily customizable for any individuals with ID/ASD and can be created on their personal iDevices.	3
[73]	0	1	0	0	1	0	0	1	0	1	The provision of AT as workplace accommodations to increase disability employment. This study contributes to the perspectives of managers and the government by highlighting the roles they could carry out to create a more accessible provision of AT and an inclusive work environment.	4
[55]	0	1	0	1	0	0	1	0	0	0	A system to read an electroencephalogram(EEG) of the brain in real time, in conjunction with a brain–computer interface (BCI) for people who suffer any motor disability. The system helps people perform at their work without the need for moving, using only their thoughts.	3
[56]	0	1	0	0	1	0	0	1	0	1	Results analyzed the ATs that can be used for supporting the labor market inclusion of persons with ASD, the skills they help to develop, and the work activities they can support.	4
[64]	0	1	0	0	1	0	1	1	0	0	Technology as a factor linked to productivity results: products, including audio/video cueing systems, devices, such as tablets and phones, and personal digital assistants.	5
[65]	1	1	1	0	1	0	0	1	0	0	Preference over simple and clear technology features for people with mild cognitive impairment or early onset dementia.	5
[74]	0	1	0	1	1	0	1	1	0	0	Technology as an effective intervention to increase work participation of people with disabilities; different disabilities may require different technological assistance tools: i.e., apps for prompting and telehealth to enhance “direct” interventions by occupational therapists.	5
[81]	0	1	0	1	1	0	0	0	1	1	Machine learning methods can help mitigate certain disparities, but fairness alone is insufficient to secure accessible, inclusive AI. A disability justice approach, which provides a framework for centering disabled people’s experiences and attending to the structures and norms that underpin algorithmic bias.	5
[57]	1	1	0	1	1	0	1	1	0	1	GPS technology as a tool to help aging individuals with IDD navigate public transit systems.	7
[58]	0	1	0	1	0	0	1	0	0	0	Use of computers as the main work tools in relation to qualification level and degree of disability. A substitution effect of computer technology in the workplace was identified for routine tasks and a complementary effect for non-routine tasks for both employees with and without a declared disability.	3
[75]	0	1	0	1	1	0	1	1	0	1	Assistive technologies included a wide range of equipment used to mitigate workplace barriers and maximize productivity.	6
[80]	1	1	0	1	0	1	1	1	1	1	Social media as facilitators for the economic and social inclusion of disabled women.	8

Out of 41, only 5 articles [57,62,65,67,80] included, in addition to the work and productive activities, the activities of daily living, and only 2 articles [61,65] also included play and leisure. Regarding the human component, twenty-six articles focused on the cognitive abilities of the target population [42,43,48–52,54,56,57,59,61–66,70–74,76,77,81], eleven on physical abilities [41,42,45,47,50,53,55,60,67,75,79], fourteen on disability in a broader sense [46,50,51,58,68–70,73–78,81], and only three on the affective dimension [77,78,80].

The context component mainly referred to the physical dimension [41–43,45–55,57,59–62,64,66–72,74,77–80] (in terms of accommodation) and, secondly, to the social dimension [42–44,47,48,50,52–54,56,57,59–65,67,70–75,77–80] (mainly understood in its participative dimension to the working environment). The cultural dimension of the context was investigated in five articles [77,78,80,81] and the institutional dimension in twelve articles [50,57,62,70,71,73,75–78,80,81].

## 6. Discussion

In this review, we aimed to systematically select and summarize the up-to-date, available evidence on the use and development of assistive products and services to better achieve the workplace inclusion of *PwDs*.

The main objective was to provide an overview of the current research priorities to implement an inclusive workplace, promote health and well-being, and develop evidence-based policies for disabilities [82].

The assistive technologies and disability domains were mainly used to conceptualize and choose the predetermined search terms, which were thought to reflect two complex categories of the human mind. When interpreting the results through a three-step model of analysis, we summarized the literature trends and provided an overview of the societal changes in language and technology [14,83].

The year 2017 was chosen as the starting period, which was considered particularly informative to the research recommendations on assistive technologies, including the features of the technology, the domains where the technology is used, and the ever-evolving international policies that necessarily refer to the impact of technology on the life spheres of individuals or groups.

In the selected timeframe (2017 to mid-2023), we included 41 studies, in which there were 11 systematic reviews, 5 scoping reviews, 1 umbrella review, and 1 systematic review protocol. In terms of the geographical distribution of the included articles, the authors' country of affiliation showed that 24 published works were from the Americas, including 17 articles from the USA, 6 from Canada, and 1 article from Mexico. The total count for the European continent was 10 articles, including 1 article which was co-authored between Canada, Sweden, Norway, and Finland. From Oceania, there were four articles from Australia, including two articles that were co-authored between Australia and the USA. A total of seven articles were from the Asian continent, including two articles from China, two articles from India, one article from Indonesia, one article from Saudi Arabia, and one article which was co-authored between South Korea and the USA. The final list of the articles showed that there were no included articles where the author's country of affiliation was related to the African continent.

The absence of contributions from the African continent was confirmed by a systematic review [84] concerning the education and social inclusion of persons with disabilities conducted in five West African countries, namely, Cameroon, Liberia, Mali, Sierra Leone, and Senegal. Further reference to previous evidence suggested a large implementation gap in inclusive policies across the African continent, which highlighted the ongoing need to implement standardized tools to monitor intervention programs and the enforcement of legal rights [85].

### 6.1. The Nature of Assistive Technologies

Overall, we encountered a considerable heterogeneity in studies concerning the use of AT and the concept of disability. A total of 14 articles dealt with disability in its most general

sense [46,50,51,58,68–70,73,74,76–78,80,81] and among these only 2 articles, by Kumari and Lenka [50] and Smith and colleagues [74], comprehensively analyzed the different levels and forms of disability in the more general idea, proposed by the authors themselves, that various disabilities may require different approaches.

A total of 9 articles focused on the different forms of physical disability [41,47,53,55,60,75,79,80] and 16 focused on mental illness [66], dementia [59,65], or different forms of intellectual and developmental disabilities, including autism [43,44,48,49,54,56,57,61–64,72].

AT appeared to emerge primarily as a work adaptation tool, useful in facilitating employment inclusion and occupational participation [48,50,52,54,56–65,67–75], whose aim is to bridge the gap from a commonly expected standard of functioning. In these terms, AT lends itself as a useful method to support people with disabilities and allow them to achieve a greater degree of autonomy or reinforce their employers in maintaining production targets [41,58,64,70,76,78]. On the other hand, AT was found to be a useful strategy to facilitate social participation and communication processes, particularly in autism [48,52,57,59,63,67,80], while it could also improve the overall quality of work life [61,64,66]. Nevertheless, the relevance of self-efficacy, empowerment, and professional growth was addressed in a limited number of articles [51,59,67,77–80].

In a recent publication, Iosif and Radu [86] analyzed the issues of the employment of PwDs and proposed what organizations should or should not do. This body of literature appeared more oriented toward a conceptualization of people with disabilities as productive members of organizations and referred to them by the ways an AT could mobilize their skills, talents, competencies, or abilities [87].

In the case study by Zheng and colleagues [80], AT was referred to on social media platforms as an empowerment tool in the work contexts of disabled women. As an instrument, the work of Lin and colleagues [17] reviewed the self-entrepreneurship of AT within the neo-liberal context of China. In terms of risks in AT, Owuor and colleagues [62] addressed cyberbullying as part of their review protocol. As a method, two articles [65,72] used a participatory approach and tried to include the direct experience of disabled workers in both the design and analysis of AT.

## 6.2. Towards a Definition of Workplace Inclusion

Through the lens of the thematic analysis (step 2), we identified four significant dimensions in the study of technology and inclusion in the workplace. When facing the barriers to social participation [88] and numerous possible definitions to identify workplace inclusion in all forms of disability, this study described the usage of pre-existing schemes in the current literature and suggested new research trends.

The first cluster (*social impact of technology*) emphasized the impact of technology on the social lives of individuals with disabilities in terms of dimensions such as identity construction, self-determination, participation in the workplace, and discrimination [51,59,67,77–80]. Several studies underscore the influence of human experience and sociocultural construction in the representation of disability [89–91].

Individuals with disabilities consistently redefine their identity in response to various situations [92]. For instance, in China, some individuals with disabilities choose to align themselves with the “disability community” to access social and personal benefits, while others prefer to distance themselves from this community and endeavor to create alternative narratives of the disability experience [93]. In relation to the use of technologies, the research conducted by Zheng and colleagues [80] effectively demonstrates how social media can serve as an empowerment tool for individuals with disabilities, both in the professional sphere and in their daily lives.

The second cluster (policy impact of technology) focused on policy dimensions linking disability with technologies. From the policies of workplace accommodations to the rules of labor market prediction and production to academic “production”. The political, social, and economic context plays a crucial role in the definition, experience, and opportunities of

people with disabilities [81]. This perspective has a significant impact on legislation and public policies related to the world of AT and the perception of people with disabilities.

The third cluster showed an instrumental use of technology for employees with disabilities, for purposes such as eHealth interventions and task-oriented work [43,45,49,60,64,65,68,74,75]. These dimensions lend support to the descriptive data that emerged from step 1. Technology was hereby seen as a useful device to intervene in the workforce support, and to reduce the performance and production gaps between employees with and without disabilities.

Finally, the fourth cluster consolidates “areas of insistence”, emphasizing technology and its “benefits”, “effects”, and “outcomes” on individuals with “various” forms of disabilities, as well as their integration in the workplace. This framework encapsulates the main theoretical, application, and research directions within the literature covered by this study.

In relation to the included studies, from 2021 there is a progressive increase in publications. This increase can probably be explained by the COVID-19 health emergency and related social distancing measures that have significantly affected working conditions worldwide, with pre-existing vulnerabilities and the rise in remote work prompting an innovative use of technology [94]. Along with the legal requirements and new regulations in place, theoretical insights from telecommuting can also be assumed to explain the diversity of approaches to disability, learning styles, and accommodations to work environments [95] which were found to be present since 2017.

### 6.3. Implications for Policy, Practice, and Research

By considering that *PwDs* may have specific rather than generic emotional needs, and a predetermined or limited availability of tasks and career opportunities, all the cultural aspects that research and policy must consider can build upon shared decision-making mechanisms of inclusion and health [96–99].

Following the analysis of the HAAT model, we noticed that there are unsolved issues beyond the accessibility of the AT in the workplace, namely, respect for persons, non-discrimination, and the fight to tackle marginalization [100]. Against the most common advantages and limitations to generalizing the use of AT as a social enterprise [101,102], minor attention in the analyzed literature was found to be more frequently given to the affective domain, and the cultural and institutional contexts.

Colella and Stone [103] previously highlighted how emotion, cultural norms, and values can play a significant role in workplace discrimination towards disability. For example, culture can influence emotions by informing individuals on how emotional responses to disabilities should be controlled or expressed under given circumstances. In the near future, both the access to and misuse of emerging technologies may indeed represent a major challenge for policymakers in the face of global market demands and commercial interests of private companies aimed at developing tailored solutions and innovative applications in the workplace.

Likewise, the use of AT in the workplace cannot ignore the human component, which refers to one’s own commitment to work, to choose from the available options, and to interact with the environment meaningfully. Following this systematic review, we recommend training the parties involved at all levels on the job requirements [104], including how an activity is performed, the duration and frequency of each task, and the added value of AT in the workplace [19].

Recently, the examination of national and international service delivery practices in diverse funding environments has indicated various challenges and opportunities for improvement. CRT (complex rehabilitation technology) consumers are negatively impacted by current service delivery practices and more consistent and widespread research is needed within the CRT provision industry to grow evidence-based practice related to complex rehabilitation technology and individuals with disabilities [105]. National stakeholders urgently need to collaborate in order to remove barriers to rehabilitation and provide assistive technology for refugees with disabilities. Initiatives should focus on health

literacy, data collection on health, disability, and assistive technology, and the organization of community-based rehabilitation programs [106].

In summary, assistive technologies directly contribute to increasing the employment rate of people with disabilities by addressing accessibility challenges, enhancing job performance, and providing opportunities for independence and career growth. When employers and organizations actively incorporate AT into their work environments, they create a more inclusive and equitable job market that benefits both individuals with disabilities and society as a whole. To maximize the impact of assistive technologies on employment rates, it is crucial for governments, businesses, educational institutions, and organizations to invest in research, development, and training programs. Additionally, fostering a culture of diversity and inclusion is essential to creating a more inclusive workforce where people with disabilities are valued for their skills and contributions.

## 7. Conclusions

Long-term speculative arguments suggest that the use of AT is likely to enable social inclusion for *PwDs*. However, there is contrasting evidence in day-to-day settings on whether such an inclusion can be implemented with or without adequate support from work colleagues, through formal or informal mentoring programs, or by fostering self-efficacy and autonomy [107,108]. The analysis of the major possibilities and challenges ahead in policymaking found that increasing the use of internet-enabled devices in everyday settings is being attempted [109], while difficulties in the deployment of AT will remain due to either accessibility issues or individual differences in limitations of activity and performance.

Further to our study focus on the workplace, future research could embody innovation in the affective and cultural processes, through which social participation is achieved, whereby an enhanced AT framework (including traditional equipment and emerging technologies) would have to consider the human component and the interaction “human–technology–human” in the entire workforce. Taken as a whole, the results showed that artificial-intelligence-based systems and applications can be merged in traditional AT.

AT could contribute to increasing the employment rate of people with disabilities. Let us focus on these direct contributions:

**Overcoming Accessibility Barriers:** AT can address physical and digital accessibility barriers in the workplace, such as inaccessible websites, documents, or facilities. For instance, screen readers and text-to-speech software enable individuals with visual impairments to access digital content, making online job applications and training materials accessible.

**Enhancing Job Performance:** AT tools like screen magnifiers, voice recognition software, and ergonomic adaptations can significantly improve the job performance of individuals with disabilities. This increased efficiency and productivity can make them more competitive candidates in the job market.

**Increasing Independence:** AT can reduce the need for personal assistance or accommodations, allowing individuals with disabilities to work more independently. This can lead to greater self-confidence and job satisfaction.

**Expanding Career Opportunities:** AT can enable people with disabilities to explore a wider range of career options. For instance, assistive communication devices can empower those with speech impairments to pursue careers that involve public speaking or customer interaction.

**Remote Work Opportunities:** The rise in remote work, facilitated by AT like video conferencing and remote collaboration tools, has opened up job opportunities for people with disabilities who may face transportation or physical accessibility challenges when commuting to a physical workplace.

**Adaptable Work Environments:** AT can make it easier for employers to create adaptable work environments that cater to the diverse needs of their workforce. This flexibility can attract a broader range of talent, including individuals with disabilities.

**Legal Compliance:** AT helps organizations comply with disability-related employment laws by providing the necessary accommodations. This not only ensures legal adherence but also promotes a more inclusive work culture.

**Long-Term Employability:** For individuals with degenerative conditions, AT can provide long-term employability by accommodating changing needs. This can contribute to job retention and career growth.

A series of policy recommendations on the use of AT were also reviewed in terms of the best practices that could be implemented for the purpose of inclusive workplaces [110,111]. To the best of our knowledge, a transferable evidence base of assessment and strategies is possible to inform its culturally sensitive implementation [112], with the most effective practices from educational settings being adapted to promote self-determination and choice [113].

#### Limitations

The strengths and limitations of using the a priori synthesis protocol were consistent with the study aim of including qualitative studies and previous review articles in a systematic review. A set of predetermined evaluation criteria and the theoretical background were combined to produce a qualitative synthesis of relevant studies in the field. However, we conducted a systematic review and analyzed title/abstract/keyword content in step 2 which may have influenced reflexivity, i.e., the motivations behind our choice of specific search terms [114]. Using the Zotero application in abstract screening, independent double screening, and a full-text search in step 3 have proven to be useful strategies to guide the systematic evaluation process [115]. For the sake of transparency, future studies should recognize the importance of the content analysis of full texts and minimize potential bias. The reporting of all studies, despite having reviewed a limited number of the original articles, was intended to analyze the sensitivity of the literature and the novelty compared with previous syntheses. To conclude, measuring subjective outcomes based on validated scoring systems [116] has the potential to improve the quality of study reporting and to inform new developments in disability policy.

Another important limitation is that in our study we identified studies on artificial intelligence, but only in purely techno-optimistic terms. Other studies, however, report the professional dangers for workers from the intervention of AI, in particular for disabled workers. Whittaker et al. (2019) [117], in considering the intersections between disability, artificial intelligence, and work, highlight that artificial intelligence systems can generate harmful and disabling environments for workers. They highlight a real pattern of exploitation, and highlight “*the possibility of new coalitions of workers, in which those who are exploited because they are diagnosed or identified as “disabled” find common cause with workers whose working conditions, including automated management systems, are themselves disabling and exploitative*” (page 19). It would be interesting to investigate this issue further in a subsequent study.

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