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Use of Wearable Devices and Generative AI in the Workplace by People with Visual Impairments

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Abstract

Introduction: This study's purpose is to describe the use of two novel technologies – wearable devices (wearables) and Generative Artificial Intelligence (GenAI) – in the workplace by people with visual impairments.

Method: Primary data was collected via a survey conducted in late 2024 from a volunteer sample of 254 workers in the U.S. and Canada about their use of assistive technology at work. Survey data obtained from the same participants, plus an additional 60 people, in 2021 were also used. Six research questions were investigated. Quantitative data were analyzed using descriptive statistics, and qualitative data were analyzed using content analysis.

Results: Use of wearables at work increased to 10.2% in 2024. Almost all wearables utilized were smart glasses. Most people used their smart glasses frequently and considered them important to functioning both at and outside of work. GenAI was used at work by 66.7% of participants, with Be My AI the most common tool. Most people reported positive impacts of GenAI on their lives. A majority of impacts were related to visual impairment, with improved accessibility the most common, but many were unrelated to visual impairment.

Discussion: The introduction of an affordable, mainstream option for smart glasses in 2024 may explain their increased popularity among workers with visual impairments. GenAI use at work by this population was much higher than the general population, with the gap only partly attributed to incorporation of GenAI in assistive technology.

Implications: Smart glasses and GenAI are new technologies that may be beneficial to improving efficiency at work in addition to improving daily life for people with visual impairments. Smart glasses were not widely used by workers in 2024 but were beneficial to most who used them; thus, they should be considered as a potential accommodation.

Use of Wearable Devices and Generative AI in the Workplace by People with Visual Impairments

Technological advances are occurring today at an accelerated pace (Roser, 2023). These advances have improved people's lives in areas such as effortless connection, enhanced communication, healthcare innovations, and immediate access to information, generally making life easier. While these advancements have been important for everyone, they may be particularly important for people with visual impairments (i.e., those who are blind or have low vision). As our world has become more and more digital, technological advancements for people with visual impairments have been essential for their involvement in society, including the workplace (Bergson-Shilcock et al., 2023). Two areas of significant technological innovations for people with visual impairments have been the development of wearable devices (i.e., wearables) and the emergence of Generative Artificial Intelligence (GenAI).

Wearables

Technological advancements have resulted in increasingly smaller and more powerful computer equipment and digital hardware, thus paving the way for wearables for people with visual impairments. The development of wearables, defined as computer technology that is worn on the body, began in the 2000s and has become increasingly popular (Santos et al., 2021; X. Zhang et al., 2024). Many wearables focus on providing assistance with orientation and mobility; a systematic review of orientation and mobility wearables for people with visual impairments included 61 research studies published between 2001 and 2020 (Santos et al., 2021). A more recent review, covering the period of 2014 to 2024 and using broader search criteria, identified *533 publications* about wearables for people with visual impairments (X. Zhang et al., 2024). Although developers clearly have an interest in applying technological advances to create wearables, relatively few wearables have come to market and even fewer have had significant uptake by people with visual impairments (Tapu et al., 2020).

A key advantage of wearables is their hands-free nature, allowing the user to obtain assistance while keeping their hands available for other purposes. Wearables come in multiple forms, including devices worn on the upper body (e.g., backpacks), the wrist (e.g., bands), and the head (e.g., smart glasses). Although body wearables are a common form used for orientation and mobility assistance, smart glasses seem to be the most popular wearable assistive technology (AT) among people with visual impairments. Smart glasses were first introduced as a mainstream technology: Google Glass, one of the earliest and most pivotal smart glasses, was released in 2013. Following this, several technology companies launched smart glasses geared toward use in industry or gaming, many focused on augmented reality and mixed reality (Tamer, 2023). One of the most recent and affordable mainstream smart glasses was introduced in October 2023: the Ray-Ban Meta Smart Glasses (called Meta Glasses henceforth). Much research has been conducted regarding the utility of smart glasses, with several literature reviews summarizing the research in specific areas such as applied sciences (Kim & Choi, 2021), distributed care work (Z. Zhang et al., 2023), and complex healthcare (Romare & Skär, 2020).

Smart glasses have the potential to be particularly useful to people with visual impairments as they can assist with reading, object and facial recognition, and navigation. Although a number of companies have created and brought to market smart glasses specifically for people with visual impairments (e.g., OrCam MyEye, Envision Glasses, eSight), limited research has investigated the use or benefits of these smart glasses for this population. Existing studies have primarily focused on the benefits to quality of life or daily functioning, utilized OrCam, and consisted of small samples. The studies all found positive benefits to using OrCam (focused primarily on reading), and most study participants were highly satisfied with the device

(Nguyen et al., 2021; Waisbourd et al., 2015, 2019; Yip & Stoev, 2017). Given advances in technology and corresponding wearables innovations, the findings from these studies are now dated. In addition, no studies evaluated other types of smart glasses available in the market or their use at work.

GenAI

Artificial intelligence (AI) refers to the use of computers to perform tasks that typically require human intelligence, such as problem-solving, decision-making, and prediction (Russell & Norvig, 2021). GenAI, a subset of AI, is a technological innovation that uses machine learning models to generate new, human-like content, including text, images, video, and audio (Russell & Norvig, 2021). One key feature of GenAI is its ease of use through natural language prompts rather than traditional coding, making the technology available to everyone. One of the most commonly used GenAI tools is ChatGPT (Bick et al., 2025), released in November 2022. This launch contributed to the rapid rise of GenAI use in multiple aspects of life, including work. The adoption of GenAI for work-related tasks has grown steadily. Within four months of ChatGPT's launch, 12% of American adults had used it for work (Vogels, 2023), which increased to 20% in early 2024 (McClain, 2024). By late 2024, this figure had risen to 27%, with usage rates slightly higher outside of work (Bick et al., 2025).

A survey examining the use of ChatGPT among 57 individuals with visual impairments between April and October 2023 found that 37% had used the tool for personal or work-related tasks, with 25% reporting frequent use (Pundlik et al., 2024). AI, and GenAI in particular, has the potential to improve accessibility for people with visual impairments (Preece, 2024; Silverman et al., 2025). However, perceived risks associated with its use, such as accuracy and privacy, may present challenges (Silverman et al., 2025). While non-users of ChatGPT have disclosed similar concerns, 70% of visually impaired infrequent and non-users expressed interest in learning more about the tool and its potential applications (Pundlik et al., 2024).

GenAI adoption patterns vary across demographics, occupations, industries, and geographies. Users are more likely to be younger, highly educated, and male (Bick et al., 2025; Humlum & Vestergaard, 2025; McClain, 2024; Vogels, 2023). Additionally, GenAI use correlates positively with earnings, with frequent users (defined as at least weekly) earning significantly more than non-users (Bick et al., 2025). Occupation and industry also shape adoption rates, with the highest usage rates in computer/mathematical, management, business/finance, and information services occupations (Bick et al., 2025). Among the most common applications of GenAI are writing communications (39.5%), administrative tasks (25.6%), and summarizing, interpreting, or translating content (22.7%) (Bick et al., 2025). A study of Danish workers found GenAI use was most prevalent in occupations requiring substantial writing, such as journalism and marketing (Humlum & Vestergaard, 2025). Furthermore, a county-level analysis of ChatGPT use documented a positive association between usage rates and the percentage of college-educated population and people employed in technology sector jobs (Daepp & Counts, 2024).

This Study

The primary purpose of this study is to report on the use of two novel technologies – wearables and GenAI – in the workplace by people with visual impairments in 2024. We also wanted to know how GenAI has been beneficial to people with visual impairments in everyday life, including but not restricted to work. We investigated the following research questions (RQ):

1. Did the use of wearables at work change between 2021 and 2024 for workers with visual impairments?

2. How and why were people with visual impairments using wearables at work in 2024, and what devices were they using?
3. How does the use and perceived importance of wearables compare between work and outside of work for people with visual impairments?
4. What GenAI tools are used at work, and how frequently are they used by workers with visual impairments?
5. How has GenAI positively impacted the lives of people with visual impairments?
6. Do characteristics of workers who use smart glasses and GenAI differ from workers who do not use these technologies?

Method

Data Source and Sample

Data for this study were collected as part of a longitudinal panel investigation about the use of AT in the workplace by people with visual impairments, consisting of four annual surveys administered between 2021 and 2024. Study inclusion criteria were having a visual impairment, using AT on the job, being employed (or recently employed and currently job seeking) and planning to work for the next 4 years, being aged 21 or older, and residing in the United States or Canada. Participant recruitment began in early 2021. Potential participants were recruited through multiple outlets, including a research participant registry, social media, blindness organizations, blindness-specific websites, listservs, and personal contacts. Interested individuals completed a prescreen survey to determine eligibility. A total of 314 individuals completed the survey in 2021 (Survey 1). An additional 55 individuals were recruited in 2022 (who completed Survey 2 and most questions from Survey 1), resulting in a total panel of 369 individuals. All panel members were invited to complete each subsequent survey unless they were lost to attrition (e.g., withdrawal, death). The study was submitted to the authors' university's Institutional Review Board and, following review, was determined to be exempt under federal regulations (45 CFP 46) for minimal-risk research.

Data Collection

Data for this study were primarily obtained from the fourth and final survey (i.e., Survey 4), with data collected from October to December 2024. A few questions from Survey 1 (data collected between May and September 2021) were used to address RQ 1 and 6. Data were collected via Qualtrics, an online survey platform. Participants received a personal survey link by email or text (Survey 4: $n = 223$; Survey 1: $n = 286$), although a small number of participants preferred to complete the survey by telephone (Survey 4: $n = 31$; Survey 1: $n = 28$). In these cases, a member of the research team conducted the survey over the telephone and manually entered the participants' responses into Qualtrics.

In each survey, participants reported on the blindness-specific AT they used on the job by selecting from a predefined list of at least 29 AT, including computer software (e.g., third-party screen reader software for the computer), mobile apps (e.g., remote sighted assistance apps), and stand-alone devices (e.g., wearables). In Survey 4, 254 people responded to this question and were thus included in this study. Sample sizes for RQs varied for two reasons: (a) a few participants partially completed the survey and thus did not provide responses for questions that occurred later in the survey, and (b) some questions were follow-up items based on earlier responses, and a limited sample received the questions. The majority of participants were female, non-Hispanic white, highly educated, and totally blind, with a mean age of 47.5 years. Additional sample characteristics are presented in Table 1.

Variables

To answer RQ 1 and determine how the use of wearables at work changed over time, we used the wearables work AT variable from Survey 1 and Survey 4. In each survey, participants who selected wearables as one of their work AT were coded as yes; all other participants who did not select wearables were coded as no. In Survey 4, participants also reported on any new AT they adopted since the last survey (Survey 3 in late 2023), regardless of whether they used the new AT at work. Those who obtained a new AT could identify up to three AT they adopted. We utilized this data to determine how many participants had adopted wearables in approximately the past year.

Survey 4 participants who reported using wearables at work were asked a set of follow-up questions. They identified the specific devices used by selecting all that applied from a list of five options (e.g., OrCam My Eye, Envision Glasses), plus a write-in option for other devices. Among the write-in responses, Meta Glasses was the most common, and all but one response were types of smart glasses. Thus, to focus the remainder of our analyses strictly on smart glasses, we excluded this one observation's responses to the follow-up questions (RQs 2–3) and recoded the observation to a non-user (RQ 6).

Two of the wearables follow-up questions were open-ended questions: "What made you decide to adopt this device?" and "What are the primary tasks you use the device for?" Responses were coded into 11 and 7 possible categories, respectively, which were used to answer RQ 2. (See Data Analysis for a discussion on creating these categories). Other follow-up questions included two questions about frequency of use – one for work and one outside of work – with response options: the entire day, multiple times per day, about once a day, several times per week, about once a week, or less than once per week. Another two questions asked users to rate the importance of the device to functioning at work and outside of work, with response categories of essential, very important, important, moderately important, somewhat important, or not important.

Survey 4 participants were asked to report on the types of GenAI they use at work from a list of 13 common general-use (e.g., ChatGPT) and AT tools (e.g., Be My AI), plus a write-in option to list any other GenAI tools used for work. A "None" option was provided for those not using GenAI at work. To answer RQs 4 and 6, the variable *GenAI user* was created where those who selected any of the 13 tools or the write-in option were coded yes, and those who selected "None" were coded no. Those who selected "None" were asked to identify the reasons they did not use GenAI at work, selecting all that apply from three options: restricted from using, don't use/don't have a need for them, and other (write-in option). Participants who reported using any GenAI were asked about frequency of use with options of daily, multiple times per week, multiple times per month, about once per month, or less often than once per month. All participants were asked an open-ended question about GenAI's impact: "How have the advancements in GenAI, including AI added to your AT or mainstream technology, had a positive impact on your life?" (RQ 5). Responses were coded into 9 categories.

For RQ 6, we used two dichotomous independent variables – *smart glasses user* (yes/no) and *GenAI user* (yes/no) to determine whether respondent characteristics differed based on use of the technologies. Characteristics variables included respondent *age* in years at Survey 4 (continuous); *sex* (female, male); *education level* measured as highest degree attained, collapsed into 3 categories: less than a bachelor's degree, bachelor's degree, graduate or professional degree; annual *income* from all sources, collapsed into 3 categories: less than $40,000; $40,000 to $79,999; or $80,000 or more; *vision level,* or severity of visual impairment, reported as totally blind, legally blind with minimal functional vision, legally blind with some functional vision, or low vision; and *age at vision loss*, coded as preschool (ages 0-4), K-12 (ages 5-18), or post school (ages 19 or older). Finally, self-perceived *AT Skill* was obtained from Survey 1 data (including the panel supplement in 2022), where participants rated their skill level (1 = beginner to 10 = advanced) for each AT they reported using at work. The average rating for all reported AT per person was then calculated to create a continuous variable representing their overall self-perceived AT skill level.

Data Analysis

Statistical analyses were conducted using SAS 9.4. Descriptive statistics (i.e., means, frequencies) were calculated to address RQs 1–5. For RQ 6, we conducted chi-square analyses (categorical variables) using the standard Pearson's chi-square test for the dichotomous variable (i.e., sex) and the Mantel-Haenszel chi-square test for ordinal variables (i.e., education, income, vision level, age at vision loss) to test the hypothesis of a linear association between the variables (SAS Institute Inc., 2025). For our continuous variables (i.e., age, AT skill), we conducted independent samples (pooled) t-test. Statistical significance was assessed at the .05 alpha level.

We used a content analysis approach for coding responses to open-ended survey questions (Bengtsson, 2016). For these three questions (e.g., wearables follow-up questions, GenAI question), three researchers independently reviewed responses to each question to identify possible coding themes, and then collectively agreed upon the final set of codes. Next, the researchers independently coded each response and then compared their codes for consistency. When there was disagreement in the coding, the researchers discussed each comment until consensus was reached.

Results

Wearables

The percentage of participants using wearables at work increased between 2021 and 2024. In 2021, 5.4% (n = 17) of the 314 participants reported using wearables at work, whereas 10.2% (n = 26) of 254 participants reported using wearables at work in 2024. Of the 215 participants who answered both surveys, 5.6% (n = 12) reported using wearables at work in 2021 compared to 9.8% (n = 21) in 2024, a 75% increase, but only 4 of the same people used wearables in both years. Many participants adopted wearables (for use at or outside of work) between the time they completed Survey 3 (late 2023) and Survey 4: 34 people reported adopting 36 smart glasses, of which 27 were Meta Glasses.

Of the 26 participants who selected wearables as one of their workplace AT, 24 used smart glasses, 1 did not complete the survey (thus did not have follow-up data), and 1 used MaxTV Clip glasses (removed from follow-up responses to focus on smart glasses users). Of the 24 smart glasses users, 16 used Meta Glasses, 8 Envision Glasses, and 6 OrCam Glasses (5 used more than one type of smart glasses). Table 2 presents how and why participants used smart glasses at work. Most (75%) users mentioned features (in general or one or more specific features) as their reasons for adopting smart glasses. Table 3 presents the frequency and perceived importance of smart glasses use at and outside of work.

GenAI

Two-thirds (66.7%, n = 166) of participants reported using GenAI at work in Survey 4; Table 4 lists the types of GenAI used. Almost one-third of participants (31.7%, n = 79) used both general-use GenAI and GenAI in AT, 24.5% (n = 61) used GenAI in AT only, and 10.4% (n = 26) used general-use GenAI only. Of the 83 participants who did not use GenAI at work, the most common reason was don’t use/don’t have a need for any of the tools (45.8%, n = 38), followed by restricted from using these tools at work (37.4%, n = 31), and other reason (22.9%, n

= 19). Other write-in responses included not knowing enough about GenAI to use it and concerns about the use of GenAI. Participants varied in how often they used GenAI at work, but most used it multiple times per month (see Table 4).

Table 5 presents the identified themes related to how GenAI has positively impacted the lives of people with visual impairments. We first grouped most participants' comments into nine categories or themes, which included "no impact." Seven of the categories fit into two broad areas: *impacts related to visual impairment* and *impacts not specific to visual impairment*. Fourteen people (5.6%) provided a non-specific positive response that could not be classified in either area (e.g., "Very positive impact"). Impacts related to visual impairment, which 54.8% (*n* = 136) of participants mentioned, included three categories: (a) access to visual information, (b) improved accessibility (more general accessibility comments not captured by the first theme), and (c) improved independence or autonomy. The first two categories fit under an overarching "accessibility" theme. Many comments in this broad area indicated that GenAI made things easier or quicker, similar to a theme in the other broad area. One participant explained how access to visual information from GenAI has improved their life in a unique way:

> Greatly enhanced my ability to know what is in my environment when used. Makes me feel like I am more of an important participant in my own environment instead of just existing in the environment. As an example, AI has allowed me to understand what exactly I have been walking by on a street that I have traveled for months. I never realized what I was passing until I could get the feedback using AI. Makes me feel much more connected to my own environment. More of an active participant and able to interact better. I could never have these options without the AI.

Another participant described GenAI uses for visual access that increased their independence: "It has allowed me to read many more documents, access papers that my 4-year-old brings home from school, and identify packages and clothing. All of these would have used to require assistance from a sighted person."

Impacts not specific to visual impairments, which were mentioned by 43.5% (n = 108) of participants, included four themes: (a) easier/quicker access to information or task completion, (b) improved productivity (not captured by the first theme), (c) creating written or other products, and (d) unique uses (such as creating music or learning new software). The first two themes comprised an overarching theme of "increased efficiency." Illustrating easier/quicker access to information and creation of products, one participant stated: "AI has directly benefited me by providing quick access to information and content generation when creating documents for clients. I use it as a virtual assistance and tool to enhance efficiencies." Another participant described GenAI's usefulness in creating products and unique uses both at and outside of work:

> Extremely helpful for work and personal purposes! I have used it to help spruce up job opportunity emails at work. I have also used it to determine what types of books will be good to read up on related to computer science…And I have used it for much more.

Several people mentioned impacts in both broad areas. For example, this participant's improved access to visual information increased their efficiency: "I appreciate the conciseness and depth of the information that can be provided through AI. I have found a picture description with AI invaluable. I think it is such a game-changer and certainly makes things more efficient for me." Another participant also noted GenAI uses that apply to both broad areas:

> Great for interpreting screenshots sent to me in emails, reading a slide in a virtual meeting or handout, or making sense of pop-ups on my screen. I appreciate that it can give me a summary, then additional detail. This really has been a useful addition that I

didn't expect to use as much as I have.

Some participants were particularly effusive about the positive uses and benefits of GenAI: "Mostly in research, writing, music creation, image and video description. It's like dawning a mental power suit with jet packs that simultaneously speeds up learning and increases and improves my abilities." Although most participants expressed positive impacts from using GenAI, some reported no effect or did not use GenAI. For example, one participant said: "The net impact has been neutral. I don't notice significant differences in the AT itself if it's being integrated with AI. My perception of AI is skeptical at best, given the misinformation it can spread and the environmental impacts."

Characteristics of Smart Glasses Users and GenAI Users

Table 6 presents the chi-square results and Table 7 presents the t-test results comparing the characteristics of smart glasses users versus non-users and GenAI users versus non-users. A significant association existed between smart glasses use and sex, income, vision level, and AT skills: being a man, increasing income, increasing severity of visual impairment, and higher AT skills were positively associated with smart glasses use at work. Vision level was the only variable associated with GenAI use at work, with likelihood of GenAI use increasing with severity of visual impairment.

Discussion

As of this writing, this is the first study to investigate the use of wearables and GenAI in the workplace by people with visual impairments. This study provides original, descriptive information about these two innovative technologies, with results that indicate both are considered valuable to people with visual impairments who use them on the job.

Wearables

Use of wearables at work almost doubled between 2021, when the larger AT research study started, and 2024. When considering only people who responded to both surveys, the change was smaller but still substantial. However, it was notable that most people who used wearables at work in 2021 did not report using them in 2024. We do not know why some people stopped using wearables, as reasons for AT discontinuation were not addressed in the study, but this indicates that the vast majority of growth in workplace use of wearables came from new adopters. Although we do not know what type of wearables were used at work in 2021, the wearables used at work in 2024 were overwhelmingly smart glasses. In addition to the 24 people who reported using smart glasses at work, 19 more indicated they would like to have this technology to utilize at work (McDonnall, 2025).

Smart glasses were popular in 2024: 13% of our sample adopted one or more smart glasses, with the large majority being Meta Glasses. Most of the new adopters reported using their smart glasses at work. Of study participants who expressed interest in adopting a novel AT in 2022, more than 28% mentioned wearables, with smart glasses the specific technology primarily mentioned (McDonnall & Trinkowsky, in press). The availability of a lower priced, mainstream option (i.e., Meta Glasses) seemed to be the impetus for greater adoption of smart glasses. Meta Glasses were the largest adoption of a new technology we've seen in the four years of our larger AT study. Although more people started using Be My AI after its release than Meta Glasses, that was an update to an existing (and free) technology (McDonnall, 2024). Of note is that both technologies utilize GenAI. Meta Glasses have been popular with the general population too – more popular soon after their release than even Meta expected (Bezmalinovic, 2024).

Reasons people provided for adopting smart glasses aligned well with what study participants previously told us about how they decide whether to adopt a new AT or a novel AT (McDonnall & Trinkowsky, in press). Functionality was the most important factor cited previously, and 75% of smart glasses users in this survey identified features they appreciated about the smart glasses as a reason for adoption, with hands-free being the top specific feature mentioned. Affordability was the second most commonly mentioned reason for adopting smart glasses, matching the previously provided information. Two reasons tied for third in this study: being easy to use (third in the previous study) and being a mainstream device. Reading overwhelmingly was the most common task participants used their smart glasses for, followed by object identification or description, visual assistance, and scene description. Only one-quarter of participants used the device for navigation.

Most people using smart glasses at work considered the device important and used it frequently. There were some differences in frequency of use and perceived importance of the technology at work versus outside of work. About one-fifth of people used their smart glasses less than once a week at work, while no one used them that infrequently outside of work. Both at work and outside of work, half of respondents used their smart glasses multiple times per day or the entire day. Perhaps associated with infrequent use at work, about one-fifth of users did not consider their smart glasses important to functioning at work, while only one person (4%) rated them as such to functioning in daily life. Overall, respondents attributed greater importance to functioning for their smart glasses outside of work compared to at work, although a majority did consider them important, very important, or essential to functioning at work.

GenAI

A much higher percentage of workers with visual impairments used GenAI at work compared to the general population in late 2024 (Bick et al., 2025). An obvious reason for this is the incorporation of GenAI in many commonly used workplace AT (e.g., JAWS, Be My AI, Seeing AI). More than half of our sample used GenAI incorporated into their AT on the job. However, a higher percentage of our sample also used general-use GenAI at work compared to the general population – about 42% versus 27% (Bick et al., 2025). Perhaps familiarity with GenAI through use within AT made our participants more open to utilizing general-use GenAI. Alternatively, our sample may be more technologically-inclined than the entire population of people with visual impairments and the general population, thus more inclined to utilize new technology. Frequency of daily use of GenAI at work was similar for our sample and the general population – 11.5% and 9%, respectively (Bick et al., 2025). Although most people were using GenAI, either in AT tools, general-use tools, or both, one-third were not using GenAI at work, some because they were restricted from using it and some because they didn't perceive a need for it.

Almost three-quarters of participants indicated that GenAI has had a positive impact on their lives (not restricted to effects on the job). Most commonly, the positive impact related to visual impairment, with improved access to visual information being the predominant theme. Many people indicated that this improved accessibility made things easier or quicker for them. Several people reported that GenAI provided improved independence or autonomy, a few in unique and profound ways as presented in the results. Approximately one-third of respondents indicated one or more impacts unrelated to visual impairment, most associated with increased efficiency (e.g., quicker access to information, productivity boosts), and 18% only reported positive impacts unrelated to visual impairment.

Characteristics of Users Versus Non-users

The characteristics of people who use smart glasses at work were different in several areas compared to those who do not use them. People who had a more severe visual impairment, higher income, higher self-perceived AT skills, and men were more likely to use smart glasses at work. More severe visual impairment was the only characteristic that was associated with GenAI use at work. Demographic characteristics (age, gender, education level, income) were not associated with GenAI use for our sample, which contrasts with differences in demographic characteristics found for GenAI users among the general population (Bick et al., 2025). Lack of demographic differences for GenAI users may be associated with GenAI's ability to offer additional benefits to people with visual impairments, such as access to visual information, and the incorporation of GenAI in commonly used workplace AT.

Limitations

There are several limitations to this study that should be acknowledged. We utilized a convenience sample, which consisted of volunteers who signed up to participate. Most participants had severe visual impairments, which was associated with the higher likelihood of using wearables and GenAI. Thus, the percentages reported in this study may not be representative of the total population of workers with visual impairments, which includes many people with less severe impairments. The number of participants who reported using smart glasses at work was relatively small; thus, those results are based on a small sample. As is the case with all surveys, self-reported data is subject to error, either intentional or unintentional. Most people who adopted Meta Glasses and used them at work selected wearables as one of their workplace AT, but a few people did not; thus, we did not have answers to the wearables follow-up questions for them. Our survey question about workplace technology focused on blindness-specific AT; some people may not have selected wearables as Meta Glasses are mainstream technology. We only collected data about what type of wearable respondents used in 2024, thus we cannot compare specific types of wearables used between 2021 and 2024. Finally, we grouped the open-ended responses into two broad categories of impacts related to visual impairment and not specific to visual impairment. Most responses could easily be coded into these categories, but some responses may have been miscoded due to lack of detail.

Implications

Smart glasses and GenAI are new technologies that may be beneficial to improving efficiency at work in addition to improving daily life for people with visual impairments. This study provides the first data about use of these technologies at work and their perceived usefulness. Our findings indicate that the majority who use smart glasses find them important or essential to functioning on the job. Although only a small percentage of our sample were using smart glasses at the time of data collection, more would like to adopt them. Our findings indicate that smart glasses are more available to people with higher incomes and AT skills. Agencies that provide technology to consumers seeking to obtain or maintain employment should consider smart glasses a reasonable accommodation for employment, assuming the uses of the smart glasses coincide with job responsibilities. In this study, reading was an almost universal use of the device, and several people mentioned unique uses for the device that could be beneficial to others, such as operating office equipment. Previous findings from the larger AT study documented that a majority of people using wearables at work reported a need for training on how to use the device (National Research & Training Center on Blindness & Low Vision, 2022), indicating that in addition to providing the device, agencies must to provide training on its use.

The introduction of accessible, mainstream technology particularly useful for people with visual impairments is exciting. There are several advantages to adopting mainstream technology such as this for use as an AT. One clear advantage is the lower price point of mainstream technology, which will make them available to a wider audience. Another advantage is the likelihood of regular updates and the anticipated longevity of the device; many smart glasses and other technology created specifically for people with visual impairments have not lasted. Finally, utilizing a mainstream device does not make the user stand out, thus potentially making the device more acceptable to some people (Martiniello et al., 2022; Pape et al., 2002).

GenAI has been an important technological advancement for people with visual impairments, and many study participants have realized its potential to improve access and aid them in daily life. However, some participants have not used it or are not aware of its potential to benefit them in this way. Even if aware of potential benefits, users need to learn how to appropriately prompt GenAI (e.g., phrase questions or instructions) to get the most useful response. Our findings suggest that resources related to the utility of GenAI for people with visual impairments may be needed, as well as instructions for prompting. Professionals who work with this population should introduce them to the potential benefits of GenAI. In addition, people with visual impairments who are only using GenAI to help with accessibility should consider the possibilities for using GenAI to improve their work productivity in other areas.

Conclusion

While GenAI is not the solution to all accessibility challenges, it clearly has the potential to be advantageous to people with visual impairments, and our study documents its widespread use in the workplace in 2024. GenAI will likely continue to be incorporated into existing technologies, hopefully in new and innovative ways to improve efficiencies for people with visual impairments. With continued advancements in GenAI, more beneficial applications for people with visual impairments are likely in the future. Smart glasses, in particular, will likely continue to add features, many powered by GenAI, and should be considered a viable workplace accommodation. However, training or resources to support people in effectively utilizing these technologies are needed to ensure that all people who could benefit from them have access.

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Table 1

Sample Characteristics

Variable	*n*	%
Age, *M* (*SD*)	47.5	(11.7)
Sex		
Female	155	61.0
Male	99	39.0
Race/Ethnicity		
Asian	13	5.1
Black/African American	12	4.7
Hispanic/Latinx	21	8.3
White	197	77.6
Some other race	11	4.3
Vision level		
Totally blind	154	60.6
Legally blind with minimal functional vision	46	18.1
Legally blind with some functional vision	40	15.8
Low vision	14	5.5
Age at vision loss		
Preschool	179	70.5
K-12	38	15.0
Post school	37	14.6
Non-visual disability		
Yes	82	32.3
No	172	67.7
Education level		
Less than a bachelor’s degree	46	18.1
Bachelor’s degree	91	35.8
Graduate or professional degree	117	46.1
Income		
Less than $40,000	90	37.7
$40,000 to $79,999	96	40.2
$80,000 or more	53	22.2
AT Skill, *M* (*SD*)	8.0	(1.3)

Note. *N* = 254.

Table 2

How and Why Participants Use Smart Glasses At Work

Variable	*n*	%
Tasks Device Used For		
Reading	20	83.3
Object identification/description	11	45.8
Visual assistance/remote sighted assistance	9	37.5
Scene description	8	33.3
Navigation	6	25.0
Communication	2	8.3
Other	5	20.8
Reasons for Adoption		
Features		
Features (general/non-specific response)	11	45.8
Hands-free	4	16.7
Integration with other AT	3	12.5
Provides environmental information	2	8.3
Updates well	2	8.3
Affordable	6	25.0
Easy to use	3	12.5
Mainstream device	3	12.5
Saw demonstration	2	8.3
Recommendations by others	2	8.3
Other reason	2	8.3

Note. N = 24.

Table 3

Use and Perceived Importance of Smart Glasses at Work and Outside of Work

Variable	Work		Outside of work	
	N	%	N	%
Frequency				
The entire day	4	16.7	2	8.3
Multiple times per day	8	33.3	10	41.7
About once a day	3	12.5	5	20.8
Several times per week	3	12.5	4	16.7
About once a week	1	4.2	3	12.5
Less than once per week	5	20.8	0	0.0
Importance to functioning				
Essential	2	8.3	2	8.3
Very important	8	33.3	6	25.0
Important	4	16.7	11	45.8
Moderately important	3	12.5	2	8.3
Somewhat important	2	8.3	2	8.3
Not important	5	20.8	1	4.2

Note. $N = 24$.

Table 4

Types of GenAI Used at Work and Frequency of Use

Variable	*n*	%
GenAI type[a]		
Be My AI	99	39.8
Seeing AI (Ask Seeing AI feature)	84	33.7
Picture Smart AI (in JAWS)	71	28.5
ChatGPT (via OpenAI's website)	70	28.1
Aira (Access AI feature)	56	22.5
Microsoft Copilot	33	13.3
Google Gemini	24	9.6
Apple Intelligence	19	7.6
Envision app (Ask Envision feature)	18	7.2
ChatGPT (incorporated in another software/tool not on the list)	18	7.2
Other AI not listed	12	4.8
Claude AI (by Anthropic)	11	4.4
OKO AI Copilot	9	3.6
VizLens app	1	0.4
Use at work[b]		
Daily	29	18.0
Multiple times per week	41	25.5
Multiple times per month	43	26.7
About once per month	25	15.5
Less often than once per month	23	14.3

Note. [a]$N = 249$. [b]$N = 161$.

Table 5

Positive Impact of GenAI Themes

Variable	*n*	%
Impacts related to visual impairment (*sum of the 3 related themes*)	136	54.8
Access to visual information	107	43.1
Improved independence or autonomy	19	7.7
Improved accessibility	10	4.4
Impacts not specific to visual impairment (*sum of the 4 related themes*)	108	43.5
Easier/quicker access to information or task completion	49	19.8
Creating written or other products	31	12.5
Improved productivity or efficiency	18	7.3
Mentions unique use	10	4.0
Non-specific positive answer	14	5.6
No impact	64	25.8

Note. $N = 248$. Number of coded comments = 330.

Table 6

Chi-Square Results Comparing Workplace Smart Glasses and GenAI Users to Non-Users

Variable	Smart Glasses Users[a]				Gen-AI Users[b]			
	n	%	χ^2	*p*	*n*	%	χ^2	*p*
Sex			6.08	.01			0.69	.41
Female	9	5.8			99	64.7		
Male	15	15.2			67	69.8		
Education			1.08	.30			0.01	.90
Less than a Bachelor's degree	5	10.9			28	63.6		
Bachelor's degree	11	12.1			62	68.9		
Graduate/professional degree	8	6.9			76	66.1		
Income			4.77	.03			1.42	.23
Less than $40,000	5	5.6			55	61.8		
$40,000-$79,999	9	9.5			64	68.1		
$80,000 or more	9	17.0			37	71.2		
Vision level			5.20	.02			11.71	.001
Totally blind	19	12.4			112	73.7		
Legally blind with minimal functional vision	4	8.7			30	68.2		
Legally blind with some functional vision	1	2.5			17	42.5		
Low vision	0	0.0			7	53.9		
Age at vision loss			0.97	.33			0.00	.95
Preschool	16	9.0			118	67.1		
K-12	2	5.3			23	62.2		
Post school	6	16.2			25	69.4		

Note. [a]N=253. [b]N=249.

Table 7

T-test Results Comparing Workplace Smart Glasses and GenAI Users to Non-Users

Variable	Users			Non-Users			*t*	*df*	*p*
	n	*M*	*SD*	*n*	*M*	*SD*			
Smart glasses									
Age	24	48.17	11.23	229	47.46	11.74	-0.28	251	.78
AT skill	24	8.54	1.34	228	7.89	1.31	-2.31	250	.02
GenAI									
Age	166	47.34	11.45	83	48.20	11.73	-0.56	247	.58
AT skill	166	8.07	1.26	82	7.73	1.41	1.90	246	.06