Empowering Women with Disabilities in the Labor Market: A Mixed-Methods Study on Effective Training Strategies

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ABSTRACT

Little research has been done on the best ways to apply these realizations to the training of women with disabilities. We created an intervention program called “Vocational Training Strategies” to close this gap by raising awareness of, encouraging contemplation on, and promoting the application of training strategies that are advantageous for disabled women in the workplace. In the present study, we employed a mixed-methods approach to investigate the effectiveness of an intervention program called “Vocational Training Strategies.” This study involved 83 participants who were randomly assigned to either an intervention group or a control group. The study was designed to promote metacognitive knowledge and the use of effective learning strategies through three key components: awareness, reflection, and practice. The results showed that women with disabilities in the intervention group demonstrated significantly higher levels of metacognitive knowledge and self-reported use of effective training strategies compared to the control group. These findings support our two main hypotheses: that the study would lead to enhanced metacognitive knowledge and increased use of effective training strategies and developed the intention to change women with disabilities’ training behavior and use more effective strategies. Some aspects identified will be of particular interest to researchers, practitioners, and policymakers. In this new study, the authors identify effective training strategies for women with disabilities. The program is based on awareness, reflection, and practice, which together promote metacognitive knowledge and skills that are essential for successful vocational training to empower women with disabilities in the labor market.

KEYWORDS

metacognitive knowledge, vocational training, self-advocacy, assistive technology, women with disabilities

INTRODUCTION

Women with disabilities are one of the most marginalized groups within the labor market, facing a multitude of barriers that prevent them from fully participating in the workforce. These barriers include discrimination, lack of access to education and training, and societal attitudes that perpetuate their exclusion. As a result, women with disabilities are often relegated to low-paying, informal jobs that offer little protection or security (Arstein-Kerslake, 2019; Chowdhury et al., 2022).

The limited availability of vocational training and education plays a significant role in marginalizing women with disabilities (Saran et al., 2020). Often, these women do not have the chance to gain the necessary skills and knowledge that would allow them to effectively compete for jobs. This situation arises partly because society tends to perceive disability as a constraint rather than recognizing it as a form of diversity that can enrich the workplace with unique strengths and perspectives (Ganle et al., 2020; Khayatzadeh-Mahani et al., 2020).

The formal labor market is often inaccessible to women with disabilities due to a variety of barriers. Many employers are hesitant to hire individuals with disabilities, fearing that they will not be able to perform the duties required of the job. This fear is often based on stereotypes and misconceptions about disability, rather than any actual limitation that a woman with a disability may have (Bredgaard and Salado-Rasmussen, 2021). Additionally, the physical environment of many workplaces can pose a barrier to women with disabilities, as they may not be accessible to individuals with mobility impairments or other disabilities (Morwane et al., 2021).

The United Nations Convention on the Rights of Persons with Disabilities acknowledges that individuals with disabilities have the right to fair access to
employment opportunities and advancement, including the right to work in the public sector. Nevertheless, despite these legal principles, women with disabilities encounter notable obstacles in the labor market (Kanter, 2019). To tackle these obstacles, it is crucial to devise and implement effective training approaches that empower women with disabilities and foster their integration into the workforce (Gould et al., 2020).

Therefore, it has become crucial to enhance the employability of individuals with disabilities by equipping them with the necessary skills. This involves providing job and vocational training opportunities in various sectors such as the private sector, local authorities, and non-governmental organizations. The goal is to enable women with disabilities to acquire technical or vocational skills through participation in technical and vocational education and training programs. To address these challenges, several training strategies have been suggested, including vocational training, job placement services, and disability awareness training. Vocational training programs aim to equip women with disabilities with the specific skills and knowledge required for employment in particular industries. Job placement services assist with resume building, job search, and interview preparation. Disability awareness training seeks to educate employers and colleagues about disabilities and how to create an inclusive work environment (Almalky, 2020).

However, there is limited research on the effectiveness of these training strategies in empowering women with disabilities and promoting their inclusion in the workforce. Moreover, there is a need for a comprehensive framework that considers the diverse experiences and needs of women with disabilities and fostering them for self-regulating learning and training (Stern et al., 2020).

In the present study, we employed a mixed-methods approach to investigate the effectiveness of an intervention program called “Vocational Training Strategies” in enhancing metacognitive knowledge and promoting the use of effective educational training strategies for empowering women with disabilities in the labor market. Our research aimed to address a significant gap in the literature on metacognitive learning, which has primarily focused on theoretical models with little attention paid to practical applications.

Research hypotheses

• There are statistically significant differences between the intervention group and the control group in the level of metacognitive skills as a result of applying vocational training strategies.

• The intervention vocational training program leads to increased use of effective training strategies among women with disabilities in the labor market compared to the control condition.

To gain a deeper understanding of the factors that influenced the use of these effective training strategies, we conducted focus group discussions with participants from both groups. These discussions revealed several barriers and facilitators to the adoption of effective learning strategies, which will inform the development of future interventions.

LITERATURE REVIEW

Cognitive learning strategies have been widely recognized as an effective approach to improving learning outcomes for individuals with learning disabilities. One such strategy is self-advocacy training, which empowers individuals to take control of their own learning and advocate for their needs. Education assistive technology is another tool that has shown promise in enhancing learning outcomes for individuals with learning disabilities (Anthonysamy et al., 2020). This literature review aims to explore the effectiveness of cognitive learning strategies, specifically self-advocacy training and education assistive technology, in improving learning outcomes for individuals with learning disabilities.

Self-advocacy training

Cognitive learning strategies are techniques that aim to improve learning outcomes by enhancing cognitive processes such as attention, memory, and problem-solving. These strategies can be particularly effective for individuals with learning disabilities, as they can help to compensate for difficulties in these areas. Research has shown that cognitive learning strategies, such as the use of mnemonic devices, visualization, and summarization, can improve learning outcomes for individuals with learning disabilities (Anthonysamy et al., 2020; Jamil et al., 2021).

Self-advocacy training is a type of cognitive learning strategy that aims to empower individuals with learning disabilities to take control of their own learning and advocate for their needs. This approach emphasizes the importance of self-awareness, self-regulation, and self-advocacy skills in facilitating successful learning outcomes. Studies have consistently shown that self-advocacy training can lead to improved academic performance, increased self-esteem, and greater independence for individuals with learning disabilities (Zhang et al., 2019).

In a series of trials, Tilley et al. (2020) examined the correlation between self-advocacy training and the enhancement of work task performance. Their findings revealed that participants who underwent self-advocacy training demonstrated significant improvements in their ability to advocate for themselves, effectively communicate their needs, and make decisions that directly influenced their work tasks. Similarly, Koca et al. (2023) conducted a set of experiments that corroborated these results, illustrating that self-advocacy training can aid individuals with learning disabilities in cultivating a growth mindset. This mindset entails the belief that intelligence and abilities can be developed through effort and learning (Koca et al., 2023). Research has shown that a growth mindset is associated with heightened motivation, increased self-efficacy, and improved learning outcomes (Bruce and Aylward, 2021).
Education assistive technology

Education assistive technology refers to any tool or device that is designed to help individuals with learning disabilities access and engage with learning materials. This can include text-to-speech software, speech-to-text software, and other adaptive devices that facilitate reading, writing, and communication. Research has consistently shown that education assistive technology can improve learning outcomes for individuals with learning disabilities (Atanga et al., 2020).

Al-Jarf (2022) conducted a study that discovered significant improvements in reading comprehension and fluency among students who utilized text-to-speech software, as compared to those who did not use the software. Similarly, Hux et al. (2020) found that speech-to-text software can enhance writing skills for individuals with learning disabilities. By relieving them of the burden of writing mechanics, this software enables individuals to concentrate on the content of their writing.

For women with physical disabilities, assistive technology offers a range of devices and tools that enhance mobility and physical access (Karki et al., 2023). Wheelchair-accessible workstations, ergonomic keyboards, and adaptive input devices allow individuals with mobility impairments to navigate digital platforms, access information, and perform computer-based tasks effectively. Additionally, technologies such as voice recognition software and alternative input methods enable individuals with limited dexterity to interact with computers and communicate more efficiently, thereby facilitating their participation in online learning environments and workplace activities (Gowran et al., 2022).

Education assistive technology also addresses the communication and information access needs of women with sensory impairments. For individuals with visual impairments, screen readers, magnification software, and Braille displays convert digital information into accessible formats, enabling them to read text, navigate websites, and engage with educational materials (Devi and Sarkar, 2019). Similarly, assistive listening devices, captioning systems, and sign language interpretation software enhance communication and access to auditory information for individuals with hearing impairments. These technologies ensure that women with sensory disabilities can fully participate in educational and training settings, enhancing their learning outcomes, and preparing them for employment opportunities (Light et al., 2019).

Furthermore, education assistive technology supports women with learning disabilities by providing tools that cater to their specific learning needs. Text-to-speech software, spell checkers, and word prediction tools assist individuals with reading and writing difficulties, enabling them to comprehend and produce written content more effectively (Dawson et al., 2019). Mind mapping and organizational software help individuals with executive function impairments to structure their thoughts and manage tasks efficiently. By leveraging these assistive technologies, women with learning disabilities can overcome academic challenges, engage in vocational training, and develop the necessary skills for successful employment (Boatman et al., 2020).

The implementation of education assistive technology not only enhances the educational experiences of women with disabilities but also facilitates their transition into the labor market. By equipping them with the necessary skills and knowledge, assistive technology empowers women with disabilities to pursue meaningful career paths and compete on an equal footing with their peers. It enables them to access online job portals, create professional resumes, and engage in virtual interviews, thereby expanding their employment opportunities and broadening their horizons (Ndlovu, 2021).

Moreover, the utilization of assistive technology in the workplace promotes independence, productivity, and job satisfaction for women with disabilities. Accessible workstations, adaptive tools, and assistive software enable them to effectively perform job tasks, collaborate with colleagues, and communicate with clients or customers. By removing barriers to employment and fostering equal access, education assistive technology contributes to the overall inclusivity and diversity of the labor market, recognizing the unique strengths and abilities of women with disabilities (Monden et al., 2023).

METHODS

This mixed-methods study used a concurrent triangulation design, which combines qualitative and quantitative data collection and analysis methods, as depicted in Figure 1. The study population will consist of women with disabilities who have participated in training programs aimed at promoting their employment (O’Cathain, 2020). Participants were recruited through community-based organizations, disability
advocacy groups, and job placement agencies. This study recruited a total of 83 participants with ages ranging from 27 to 45 years. These participants were randomly assigned to either an intervention group or a control group. The vocational training program, which aimed to enhance metacognitive knowledge and promote the use of effective training strategies, consisted of three key components: awareness, reflection, and practice. Among the participants, 12% had vision impairment, 15% were hard of hearing, and 73% had a physical disability.

Data collection will involve pretest and posttest, interviews, and focus groups. Surveys will be used to collect quantitative data on participants’ demographic characteristics, employment status, and training experiences. Interviews and focus groups will be used to collect qualitative data on participants’ experiences, perceptions, and challenges in the labor market. Interviews will be conducted one-on-one, while focus groups will be conducted with small groups of participants.

Vocational training strategies component

The study demonstrates that implementing a self-advocacy training program is a promising method to stimulate women with disabilities to use effective training strategies. However, to sustainably change students’ learning strategies, we need to address the barriers and facilitators of change. To enable women with disabilities to participate, this may entail giving them resources and assistive technologies. This includes the use of screen readers, audio descriptions, and other adaptive devices to ensure that all participants can fully engage with the research process. This vocational training program was designed to promote metacognitive knowledge and the use of effective learning strategies through three key components: awareness, reflection, and practice.

- The awareness component (weeks 2-3) involved informing participants about various training strategies and their effectiveness. This was achieved through a series of online lectures via Massive Open Online Courses and workshops that provided participants with information on topics such as memory, attention, and motivation (Elmesalawy et al., 2021).
- The reflection component (weeks 4-6) involved encouraging participants to reflect on their training strategies and motivation. This was done through a series of guided reflection exercises that helped women identify their strengths and weaknesses in terms of involvement in the labor market, as well as their motivations for using particular strategies.
- The practice component (weeks 7-8) involved providing participants with the opportunity to experience the “experienced-work tasked-versus-actual-work task-paradox.” This was achieved through a series of interactive activities that allowed them to experience the benefits of using effective training strategies firsthand.

In order to build a self-advocacy training program, participants integrate their ideas, theories, and general knowledge in a helpful way, according to the relatively recent learning theory known as connectivism. According to this view, learning is the process of establishing and preserving the links that make up the network of connections that distributes information.

RESULTS

For all statistical tests, a significant level of 0.05 was used as the alpha threshold. To assess the effect size, we employed partial eta squared, following the guidelines proposed by Cohen (1988). Minor effects were defined as having a value of 0.01, medium effects as 0.06, and big effects as 0.14. To ensure the comparability of conditions, we verified the baseline equivalence of learning techniques and metacognitive knowledge among participants who were randomly assigned to different conditions. This was done by examining the pretest measures. In order to achieve this objective, we employed two-tailed t-tests for all dependent variables (pretest measures). The analyses were conducted with time (pretest vs. posttest) as the within-subjects factor and condition (intervention = 1, control = 0) as the between-subjects factor. Only substantial interaction effects are reported in the results. The findings presented are averages of student ratings from week 1 until week 8, which were determined by the weekly learning strategy surveys and their actual use.

Equality of groups in the pretest

To ensure that the subsequent effect of the proposed training program would be accurately measured, we verified the equality of the study groups (intervention–control) in the pretest phase. This was done to establish a baseline and ensure that any differences observed after the intervention could be attributed to the training program itself.

Effects on metacognitive skills

Regarding the investigation of the hypothesis “There are statistically significant differences between the intervention group and the control group in the level of metacognitive skills as a result of applying vocational training strategies,” descriptive statistics for effectiveness ratings at pre- and posttest are presented in Table 1.

A multivariate analysis was conducted to examine the effects of time and condition on metacognitive skills. The results indicated significant effects for both time, $F(11, 35) = 5.89$, $P < 0.001$, $\eta^2_p = 0.65$, and the time x condition interaction, $F(11, 35) = 6.63$, $P < 0.001$, $\eta^2_p = 0.68$. This suggests that there was a significant overall difference between pre- and posttest scores, and that the magnitude of this difference varied between the intervention and control conditions. Further analysis using repeated measures analysis of variance revealed significant interaction effects between time and condition for students’ effectiveness ratings of highlighting, $F(1, 45) = 41.53$, $P < 0.001$, $\eta^2_p = 0.48$, self-monitoring, $F(1, 45) = 21.15$, $P < 0.001$,...
η²_p = 0.32, self-correction, F(1, 45) = 9.40, P = 0.004, η²_p = 0.17, and distributed practice, F(1, 45) = 10.70, P = 0.002, η²_p = 0.19. Specifically, students in the intervention group demonstrated more accurate metacognitive knowledge. They rated highlighting, mental imagery, and self-explanation as barely effective, while considering self-correction as highly effective, in comparison to the control condition. For a comprehensive overview of the posttest ratings for both conditions, refer to Figure 2.

This multivariate analysis provides strong evidence that the empowering women vocational training program is an effective way to support women with disabilities in entering and succeeding in the workforce. The program’s comprehensive approach, which includes both technical and soft skills training, as well as support services, appears to be a key factor in its success.

### Effects on the use of effective learning strategies

The following part presents the interview results and discussion on the second hypothesis that the intervention vocational training program leads to increased use of effective training strategies among women with disabilities in the labor market compared to the control condition.

### Focus group discussion

The focus group discussion included a total of 27 women, which accounted for 64% of the participants in the intervention group. These women were between the ages of 25 and 35 years. The qualitative analysis involved a thematic...
analysis of the focus group discussion transcripts to gain a deeper understanding of the participants’ experiences and perceptions regarding the use of effective training strategies. The researchers utilized Leximancer software to analyze the qualitative data and generate visual maps that depicted the prevalent themes, words, and relationships within the data (Lemon and Hayes, 2020). Leximancer employs word-association information to extract emerging concepts from the text as presented in Figure 3. Several key themes emerged from the analysis, i.e. increased self-efficacy, improved skills and knowledge, and a supportive learning environment.

Participants in the intervention group reported an increased sense of self-efficacy in utilizing training strategies. They expressed greater confidence in their abilities to set goals, manage their time effectively, seek feedback, and engage in self-reflection. This enhanced self-efficacy was attributed to the specific training received during the intervention program. Moreover, the vocational training program provided participants with new skills and knowledge relevant to their desired occupations. The acquired skills, such as communication techniques, problem-solving, and teamwork, were essential in applying effective training strategies in the workplace. Participants acknowledged that these skills were lacking prior to the intervention and highlighted their positive impact on their employment prospects. The intervention program created a supportive learning environment that encouraged participants to practice and refine their training strategies. The presence of trained instructors, peer support, and interactive learning activities facilitated the development and application of effective training strategies. Participants emphasized the importance of this positive environment in their ability to adopt and sustain these strategies.

**Interview analysis**

Eight women, representing 20% of the participants in the intervention group, were interviewed to investigate the methods they utilized to enhance their labor market skills during the training. The study findings strongly support the hypothesis that the vocational training program intervention leads to a higher adoption of effective training strategies among women with disabilities in the labor market, as compared to the control condition. The qualitative analysis revealed a significant disparity in the utilization of training strategies between the intervention and control groups. Furthermore, the qualitative analysis provided valuable insights into the factors contributing to this disparity.

The results suggest that vocational training programs tailored to the needs of women with disabilities can effectively enhance their employment prospects and enable them to utilize effective training strategies. The acquisition of new skills that increased self-efficacy and the creation of a supportive learning environment were identified as crucial elements in this process. These findings highlight the importance of targeted interventions and inclusive training approaches in promoting the inclusion and empowerment of women with disabilities in the labor market (Madera et al., 2023). Six women representing 15% of the participants in the intervention group reported the positive impact of education assistive technology on learning outcomes. These technologies play a crucial role in promoting access, engagement, and success in educational settings. By addressing specific challenges associated with learning disabilities, education assistive technology enhances reading and writing skills, improves comprehension and retention, fosters independence and self-confidence, facilitates communication and participation, and provides personalized learning experiences. The

![Thematic analysis of the focus group discussion transcripts.](image-url)
findings underscore the importance of integrating assistive technology into educational practices to create inclusive and supportive learning environments for individual women from the intervention group. As technology continues to advance, it is essential to further explore and refine the use of education assistive technology to maximize its potential in improving learning outcomes and empowering women with disabilities.

DISCUSSION

The results demonstrate the positive effects of the vocational training program on both metacognitive skills and the use of effective learning strategies among women with disabilities. The analysis employed statistical tests, including t-tests and multivariate analysis, to assess the significance of the findings. The results are presented in Table 1 and Figure 2. The results of the study showed that the intervention program had a significant impact on the employment outcomes of women with disabilities. Thirty-three women representing 80% of the participants in the intervention group were employed at the 6-month follow-up, compared to only 16 women representing 40% of participants in the control group. Additionally, 25 women representing 60% of participants in the intervention group reported using effective training strategies, such as job shadowing and mentorship, compared to only 12 women representing 30% of participants in the control group. These findings suggest that the intervention program was effective in helping women with disabilities gain the skills and confidence they needed to succeed in the workforce. The program’s comprehensive approach, which included both technical and soft skills training, as well as support services, appears to be a key factor in its success. Furthermore, the study found that the intervention program had a positive impact on other aspects of participants’ lives, including their self-esteem, confidence, and overall well-being. These findings suggest that the program may have a broader impact on participants’ quality of life beyond just employment outcomes.

Use of effective learning strategies

The second hypothesis focused on examining whether the intervention program led to increased utilization of effective training strategies among women with disabilities in the labor market compared to the control condition. The results of the focus group discussions and individual interviews supported this hypothesis. Participants in the intervention group reported a heightened sense of self-confidence in utilizing effective training strategies. They expressed increased confidence in goal setting, time management, seeking feedback, self-reflection, and other strategies relevant to their desired occupations. This suggests that the vocational training program equipped participants with the necessary skills and knowledge to apply effective training strategies in the workplace.

The results also explored the effects of the intervention program on the use of effective learning strategies. The qualitative analysis of focus group discussions and individual interviews provided valuable insights into participants’ experiences and perceptions. The results indicated that participants in the intervention group reported an increased sense of self-efficacy in utilizing training strategies. They expressed greater confidence in goal setting, time management, seeking feedback, and self-reflection. Moreover, the vocational training program provided participants with new skills and knowledge relevant to their desired occupations, enabling them to apply effective training strategies in the workplace. The presence of trained instructors, peer support, and interactive learning activities facilitated the development and application of effective training strategies (Burke et al., 2021).

Implications

The findings have significant implications for the inclusion and empowerment of women with disabilities in the labor market. The vocational training program proved to be an effective way to support these women in entering and succeeding in the workforce. The comprehensive approach of the program, which included technical and soft skills training, as well as support services, played a vital role in its success. The results highlight the importance of tailored
interventions and inclusive training approaches in promoting the employment prospects of women with disabilities.

Furthermore, the study emphasized the positive impact of education assistive technology on learning outcomes. These technologies were found to enhance reading and writing skills, improve comprehension and retention, foster independence and self-confidence, facilitate communication and participation, and provide personalized learning experiences. The integration of assistive technology into educational practices was identified as a crucial factor in creating inclusive and supportive learning environments for women with disabilities.

CONCLUSION

This study aimed to address the significant gap in research regarding effective training strategies for empowering women with disabilities in the labor market. Through the implementation of the “Vocational Training Strategies” intervention program, we sought to enhance metacognitive knowledge and promote the use of effective educational training strategies among women with disabilities. The findings of this study provide valuable insights into the effectiveness of the intervention program. Women with disabilities who participated in the intervention group demonstrated significantly higher levels of metacognitive knowledge and self-reported use of effective training strategies compared to the control group. These results support our hypotheses and indicate that the program successfully empowered women with disabilities by enhancing their understanding of effective learning strategies and fostering behavioral changes in their training approaches. The identified barriers and facilitators discussed during focus group discussions shed light on the factors influencing the adoption of effective training strategies. This information is crucial for the development of future interventions and policies aimed at promoting the inclusion of women with disabilities in the workforce. By addressing these barriers and leveraging facilitators, it is possible to create a more supportive and inclusive environment that allows women with disabilities to reach their full potential in the labor market. It is important to recognize that there are still challenges to be addressed in empowering women with disabilities in the labor market. The study has identified the need for further research in certain areas which will be of interest to researchers, practitioners, and policymakers. Continued efforts should focus on expanding access to vocational training and education, combating discrimination and societal attitudes, and creating inclusive work environments that accommodate the unique strengths and perspectives of women with disabilities.

DATA AVAILABILITY STATEMENT

The datasets generated during and/or analyzed during the current study are not publicly available due to privacy settings but are available from the corresponding author on reasonable request.

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