

Integrating Andragogy Principles in Employee Training: Literature Study

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Abstract

This study aims to analyze and synthesize the results of research on the integration of andragogy principles in employee training and identify best practices for its application in human resource development. The research uses the literature study method (library research) with a descriptive-qualitative literature review approach. The research data is in the form of secondary data sourced from 10 national and international journal articles published in 2017–2025 which were obtained through Google Scholar, Scopus, SINTA, Garuda, and ResearchGate. Data collection is carried out through documentation studies, while data analysis uses content analysis which includes data reduction, theme grouping, data presentation, and conclusion drawn. The results showed that the application of andragogy principles, such as self-directed learning, relevance of the material to work needs, utilization of participant experiences, problem-based learning, and intrinsic motivation, contributed to increased participant engagement, skill retention, learning satisfaction, and training effectiveness. In addition, the integration of digital technologies, gamification, and artificial intelligence expands the implementation of andragogy in modern training that is more adaptive. In practical terms, these findings provide a basis for organizations to design participatory, contextual, and flexible training. Theoretically, this study strengthens the relevance of andragogy as an adult learning approach in an organizational context. Further research is suggested to test the effectiveness of an andragogy-based training model through empirical studies on various industrial sectors.

Keywords

Andragogi Principles; Employee Training; Adult Learning; Human Resource Development

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1. INTRODUCTION

The rapid development of digital transformation, work automation, and the use of artificial intelligence (AI) until 2026 has disrupted the workforce competency landscape in various industrial sectors globally. Organizations now face the great challenge of responding to these changes by reskilling and upskilling the workforce through responsive and technology-based training programs. However, in the field, many training programs are still stuck in the conventional teacher-centered approach, where participants only act as passive recipients of information. This approach has an impact on low participant engagement, minimal knowledge transfer to the work environment, and decreased post-training skills retention (Knowles, 1983; Merriam & Bierema, 2013).

This condition becomes more urgent to be addressed, considering that most of the trainees in



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today's work environment are adult learners who have unique characteristics compared to students in formal education. Adults tend to have diverse work experiences, specific learning needs, practical learning orientations, and a preference for independent learning. Therefore, a learning approach that does not pay attention to these characteristics has the potential to reduce the effectiveness of training. In this context, andragogy developed by Knowles (1984), with the main principle that puts experience, learning needs, material relevance, and participant independence at the center of the learning process, becoming a more relevant framework for training in the modern world of work.

The principle of applying andragogy should also pay attention to the learning styles of participants so that the training program can be adjusted to individual needs, so that learning effectiveness increases. Providing hands-on practical opportunities in a work-like situation is essential to strengthen the transfer of skills to a real work environment. The principle of learning readiness and material relevance are the main factors that increase the learning motivation of adult participants, because they tend to be more motivated if the training material is in accordance with the challenges of the job they are facing. The integration of the latest digital technologies such as AI-based e-learning, gamification, virtual reality (VR), and microlearning must be designed to support the principles of andragogy, giving participants the freedom to choose the appropriate learning method while providing personalized assistance in the learning process. In the context of today's world of work, the application of andragogy not only improves technical skills, but also builds professional competencies that are adaptive and relevant to the needs of the industry.

Various studies in the last decade confirm that the application of the principle of andragogy in employee training is able to increase learning effectiveness. Bahrani (2024) Finding andragogy-based training provided significant improvements in learning satisfaction, skill retention, and engagement compared to conventional method participants. Meanwhile, Knapke et al. (2024) highlighting the importance of learning readiness, participant experience, and problem-based learning in improving the success of professional team training in a dynamic work environment. The integration of adult learning principles with artificial intelligence technology has the potential to strengthen the process of reskilling, upskilling, and organizational learning, thereby increasing the readiness of the workforce to face the transformation of the world of work (Goel et al., 2024; Rahman & Singh, 2024). Sánchez-Domenech & Cabeza-Rodríguez (2024) Support these findings by stating that digital transformation combined with the principles of andragogy encourages independent learning and is relevant to work needs. Green (2024) Demonstrate transformational leadership that integrates andragogy capable of improving learning transfer in digital organizations.

Recent research further strengthens the relevance of the application of andragogy principles in employee training in the era of digital transformation. Research Zainuddin, Rasyidin, Zanzibar, Aruni, & Nurmasyahyati et al (2023). It shows that the application of gamification designed based on the principles of andragogy can increase learning motivation, participant involvement, and learning outcomes in adult learners compared to conventional online learning. In line with that, Zainuddin, Chu, & Othman (2024) Develop a gamification evaluation instrument based on the principle of andragogy and conclude that gamification is an effective strategy to improve the adult learning experience through more interactive and participant-centered learning. On the other hand, research on the use of immersive technology has also shown positive results. The ELEVATE-XR framework developed by Stanney, Skinner, & Hughes (2023) explained that Extended Reality (XR) technology designed based on learning theory and andragogy principles is able to increase the effectiveness of complex skills training through authentic and competency-based learning experiences. In addition, the research Rodrigo, Iniesto, & Garcia-Serrano (2024) shows that the integration of andragogy principles with MOOC-based online learning can improve collaboration, concept understanding, and adult learner engagement in a digital learning environment. The results of the study indicate that the implementation of the andragogy principle is growing through the use of gamification, online learning, and immersive technology to support employee training that is more adaptive to the needs of the modern workforce.

Although many studies support the effectiveness of the principle of andragogy, most studies still focus on specific contexts, methods, or aspects of adult learning resulting in partial conclusions. Some studies have focused on the effectiveness of learning technology, while others have focused on participants' motivation, leadership, or learning experiences. As a result, there are limitations in understanding the patterns of application, similarities, differences, and best andragogy training practices that can be generalized for human resource development. In addition, there is still relatively little literature review that systematically synthesizes the results of specific research on the application of andragogy in employee training. This condition shows a research gap that needs to be filled through a more comprehensive and integrative literature study.

Based on this description, this study aims to analyze and synthesize the results of research on the integration of andragogy principles in employee training and identify best practices for its application in human resource development. This study specifically seeks to answer three questions: (1) how to apply the principles of andragogy in employee training based on previous research; (2) what are the similarities and differences in research findings related to the implementation of andragogy-based training; and (3) how best practices apply the principles of andragogy in improving the effectiveness of employee training in various organizational contexts.

In contrast to previous research that tended to examine the partial application of andragogy, both from the aspects of learning technology, learning motivation, transformational leadership, and experiential learning, this study presents a more comprehensive synthesis of the integration of andragogy principles in employee training in various organizational contexts. The novelty of this research lies in the effort to identify implementation patterns, similarities and differences in empirical findings, as well as formulate best practices for the application of andragogy that are relevant to the needs of human resource development in the era of digital transformation and artificial intelligence.

2. METHODS

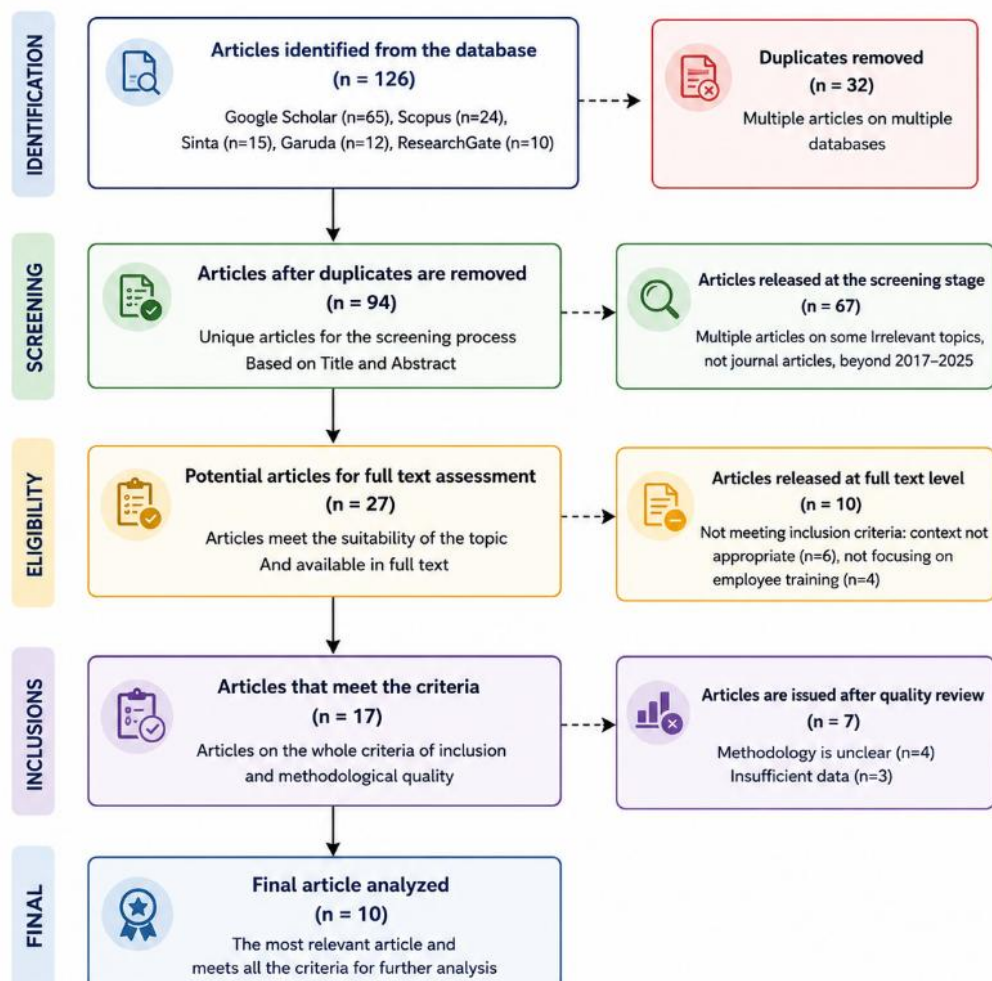
This study uses a type of library research with a descriptive-qualitative literature review approach. This approach was chosen to identify, review, evaluate, and synthesize various research results related to the application of andragogy principles in employee training. The literature study allows researchers to gain a comprehensive understanding of the concept, implementation, effectiveness, and development of the application of andragogy in the context of human resource development in the work environment. In addition, this approach is used to find patterns, similarities, differences, and trends found from various studies so that a more systematic and in-depth synthesis of knowledge can be produced (Creswell, 2022).

The data used in this study is in the form of secondary data derived from articles in national and international scientific journals that discuss the principles of andragogy, adult learning, and employee training. The data source was obtained through searching the academic databases of Google Scholar, Scopus, ResearchGate, SINTA, and Garuda. The process of identifying and selecting articles is carried out in stages based on the inclusion and exclusion criteria presented in Table 1. The initial stage produces a number of articles obtained from various academic databases, then filters are carried out based on the year of publication, type of document, relevance of the topic, and the availability of a complete text (full text). Articles that do not meet the selection criteria are excluded from the analysis process. After going through the screening stage, 10 articles from national and international journals were obtained that met all inclusion criteria and were considered the most relevant to be further analyzed as a source of research data. The selected articles were then used to identify patterns of application of andragogy principles, compare findings between studies, and compile a synthesis of best practices for andragogy-based employee training. To ensure the quality and relevance of the analyzed data sources, this study applies the inclusion and exclusion criteria as presented in table 1., below.

Table 1. Article Selection Criteria

Aspects	Criteria Inclusion	Exclusion Criteria
Year of Publication	2017–2025	< 2017
Document Type	Peer-reviewed journal article	Books, proceedings, theses, dissertations, blogs
Topics	Andragogi, adult learning, employee training	Irrelevant to employee training
Document Access	Full text available	No full text available
Quality Source	Scopus, SINTA, Garuda, ResearchGate, Google Scholar	Non-scientific sources

The literature search process is carried out in stages following the principle of systematic literature review which is adjusted to the needs of the research. The initial stage produced 126 articles obtained from Google Scholar, Scopus, SINTA, Garuda, and ResearchGate using the keywords andragogy, adult learning, employee training, corporate training, self-directed learning, and professional development. After the removal of duplicate articles, there are 94 articles left for the title and abstract filtering process. The next stage produced 27 articles that met the suitability of the research topic and were available in full text form. After a thorough review based on inclusion and exclusion criteria, 10 articles were obtained that were considered the most relevant and met quality standards to be further analyzed in this study.

Figure 1. Plot Selection Plot (PRISMA)

Data collection was carried out through documentation techniques by searching scientific articles using the keywords andragogy, adult learning, employee training, corporate training, self-directed learning, and professional development. According to Sugiyono (2021) Documentation studies are data collection techniques that are carried out by reviewing written documents, images, and scientific works that are relevant to the research. The data collection stage is carried out through several steps, namely: (1) identification of articles from various academic databases; (2) filtering by title, abstract, and keyword; (3) selection using inclusion and exclusion criteria; (4) full-text review; and (5) extraction of important data from each article which includes the author's name, year of publication, research objectives, research methods, main findings, and andragogy principles used. All data that has been collected is then compiled in the form of a study summary table to facilitate the process of analysis and synthesis of research findings.

The data analysis technique used is content analysis with a descriptive-qualitative approach. The analysis is carried out in stages following the model Miles, Huberman & Saldana (2013) which includes data reduction, data presentation, and drawing conclusions. In the data reduction stage, the researcher selects and groups information relevant to the focus of the research. Furthermore, data was presented through a synthesis table containing the characteristics of the research, methods used, and the main findings of each article. The next stage is the coding and grouping of themes based on andragogy principles found in various studies, such as self-directed learning, material relevance, learning experience, learning readiness, problem-based learning, and intrinsic motivation. Once the main themes are established, interpretation and synthesis are carried out to identify similarities, differences, tendencies of findings, and best practices for the application of andragogy principles in employee training. The results of the synthesis are then used to draw conclusions and formulate research implications.

3. FINDINGS AND DISCUSSIONS

As a first step in conducting a literature synthesis, this study identified and analyzed ten articles that met the selection criteria and had high relevance to the topic of andragogy-based employee training. The analysis was carried out to reveal the trends of research findings, the form of application of andragogy principles, and their contribution to the effectiveness of employee training. A summary of the characteristics and main results of each study is presented in Table 2 to facilitate the identification of patterns, similarities, and differences in findings between studies which then become the basis for the synthesis and discussion process.

Table 2. Summary of Studies Reviewed

No.	Author (Year)	Article Title	Method	Key Findings	Principles of Andragogy used
1.	Fallahi, Rezaei, & Delavarpour (2025)	A Study of Corporate Training Evaluation Using Andragogy Principles	Qualitative	Mindfulness, motivation, and active participation of participants in post-training evaluations play an important role in increasing the effectiveness of training.	Mindfulness, intrinsic motivation, & participation.
2.	Goel, Dede, Garn, & Ouet (2024)	AI-ALOE: AI for Reskilling, Upskilling, and Workforce Development	Conceptual framework/perspective	AI supports reskilling and upskilling through adaptive, personalized, and continuous learning experiences to improve	Readiness to learn, problem-centered orientation, and need to know/relevance.

No.	Author (Year)	Article Title	Method	Key Findings	Principles of Andragogy used
				workforce readiness to face changing world of work.	
3.	Bahrani (2024)	Applying Andragogy Principles to Enhance Professional Development in Corporate Training Programs	Mixed methods	Training with the principle of andragogy improves participant engagement, skill retention, and satisfaction compared to traditional training.	Self-directed Learning, Relevance, & Practical Application.
4.	Green (2024)	Adult Learners: Connecting Andragogy and Transformational Leadership in the Classroom	Narrative literatur review	Discuss the concept of combining andragogy with transformational leadership to increase adult learner engagement and motivation.	Relevance of learning objectives, self-concept, internal motivation.
5.	Knapke, Hildreth, Molano, Schuckman, Blackard, Johnstone, Koprass, Lamkin, Lee, Kues, & Mendell (2024)	Andragogy in Practice: Applying a Theoretical Framework to Team Science Training in Biomedical Research	Mixed methods	Evaluation of quantitative & qualitative data showed that most of the participants' learning experiences were strongly related to the principles of andragogy.	Readiness to learn, orientation to problem-based learning, role of experience, self-direction.
6.	Zainuddin, Chu, & Othman (2024)	The evaluation of gamification implementation for adult learners: A scale development study based on andragogical principles	Mixed methods	The Gamification for Adult Questionnaires (GAQ) scale is valid and reliable, applied based on the principle of andragogy to evaluate gamification in training.	Need to know, self-concept, experience, readiness to learn, orientation to learning.
7.	Sánchez-Domenech & Cabeza-Rodríguez (2024)	Digital Andragogy: Need for Knowledge and the Role of Experience in an Online Master's Degree	Mixed methods	Two main principles of andragogy used in the context of adult learning as an important learning resource in improving the effectiveness of training for adults	Need to know, experience as learning resource
8.	Melliofatria, Mahdum, Hadrian, & Purwanti (2024)	Models For Andragogy: A Systematic Review and Meta-Analysis	PRISMA	The adult learning model applied in training can increase participant involvement in various contexts, including	Self-directed learning, relevansi materi, applicability

No.	Author (Year)	Article Title	Method	Key Findings	Principles of Andragogy used
9.	Janchai, Siddoo, & Sawattawee (2019)	Andragogical Teaching Patterns Appropriate for Work-Integrated Learning in the Information Technology Industry	Qualitative	corporate training. The study identifies four teaching patterns (time-based, function-based, technical-task-based, case-based) that align with andragogical principles to optimize IT worker training.	Need to know, Self-concept, Role of experience, Learning readiness, Learning orientation, & Motivation.
10.	Ogienko & Lytovchenko (2017)	Andragogy as Theoretical Basis of Corporate Training in American Companies	Theoretical analysis	The study highlights the importance of andragogical principles in enhancing the effectiveness of corporate training in American companies.	Focus on autonomy, self-direction, and experiential learning.

Based on the results of the analysis of the ten articles studied, it was found that the application of the principle of andragogy makes a positive contribution to the effectiveness of employee training in various organizational contexts. In general, all studies show that participant-centered learning, relevant to job needs, and utilizing participants' experiences as the main learning resource can increase engagement, motivation, learning satisfaction, and skill retention. Findings Bahrani (2024), Melliopatria et al. (2024), and Ogienko & Lytovchenko (2017) It shows that training that provides participants with the opportunity to learn independently and connects the material with real work practices results in more optimal learning outcomes than traditional instructor-centered training approaches.

In addition to having many similarities, there are several differences in emphasis in the application of the principle of andragogy. Das et al. (2025), Zainuddin et al. (2024), Sánchez-Domenech & Cabeza-Rodríguez (2024) further highlighting the importance of integrating digital technology, artificial intelligence, and gamification as a means to improve the effectiveness of adult learning. Instead, Green (2024) emphasizing that the success of adult learning is more influenced by intrinsic motivation, transformational leadership, and interpersonal relationships built during the learning process. Research van der Stap et al (2024) It shows that learning strategies designed according to the characteristics of adult learners are able to increase learning engagement and effectiveness in digital and blended learning environments. These differences in findings show that the success of employee training does not only depend on the use of technology, but is also influenced by the psychological, social, and learning experiences of participants.

Despite the variation in approaches, all research leads to the same conclusion that the principles of andragogy remain the main foundation in the development of employee training. The synthesis of findings shows that best practices for andragogy-based training include the preparation of materials relevant to job needs, the provision of independent learning opportunities, the use of participants' work experience as a learning resource, the application of problem-based learning and case studies, and the use of adaptive and flexible learning technologies. In addition, training evaluation needs to be carried out in a participatory and reflective manner so that participants are able to identify the benefits of learning on improving their competencies and performance. Thus, the integration of andragogy principles in employee training not only improves technical skills, but also strengthens the motivation, engagement, and readiness of the workforce in the face of increasingly dynamic changes in the work environment.

Discussion

The application of andragogy in employee training shows that adult learning focuses not only on the delivery of material, but also on how participants are actively engaged, leveraging work experience, and connecting learning to their professional needs. Various studies confirm that the effectiveness of employee training is influenced by the suitability of the andragogy principle with the characteristics of adult learners, especially in the context of changing world of work, digitalization, and the demands of continuous competency development. Therefore, this discussion will focus on three main aspects, namely the principles of andragogy applied in employee training, implementation strategies used in various organizational contexts, and challenges and solutions in the application of andragogy in professional training.

Principles of Applied Andragogy

The results of the synthesis show that the application of the principle of andragogy in employee training is closely related to the six main principles of andragogy according to Knowles (1983), namely need to know, self-concept, role of experience, readiness to learn, orientation to learning, and motivation to learn. The need to know principle is seen when adult participants need an understanding of the direct benefits of training on their work. Research Sánchez-Domenech & Cabeza-Rodríguez (2024) It shows that adult learners are more motivated when the material has direct relevance to their professional needs and experiences. These findings are supported by research Bahrani (2024) stating that the relevance of the work material increases participant engagement and skill retention.

The principle of self-concept is seen through the application of self-directed learning. Adults tend to want to organize their learning process independently. Research Bahrani (2024) found that learning independence-based training resulted in higher motivation and learning satisfaction. This is in line with research Sumarni & Sudira (2022) which confirms that adult learning becomes more effective when participants are given flexibility, autonomy, and responsibility for their own learning process. In addition, the research Nallaluthan, Masran, Durasingham & Ganapathy (2023) Explains that the Andragogi based Work-Based Learning approach is able to increase employee motivation, participation, and learning satisfaction because learning focuses on real work experience and the professional needs of participants.

The principle of role of experience is one of the most dominant principles in various studies. Participants' work experiences are used as the main learning resource through case discussions, simulations, mentoring, and real-world problem-solving. Research Knapke et al., (2024) It found that about 85% of participants' learning experiences were related to the principles of andragogi, particularly work experience and problem-based learning. Similar findings were also pointed out by Janchai et al (2019) which emphasizes the use of case-based learning and real-world tasks in the training of IT industry workers. In addition, the research Yuliani, Hufad, Komar, Karwati & Hamdan (2024) Showing that experiential and collaborative learning can significantly improve the quality of adult training. Research Rahmawati & Hiryanto (2023) stated that the application of andragogy in various adult education contexts is able to increase learning motivation, material understanding, and learning outcomes because participants are actively involved through their experiences. Research Yahya, Purnama & Supeno (2024) It was found that learning methods that focused on life experiences, material relevance, and participant independence were able to significantly increase the effectiveness of adult learning.

The principle of readiness to learn can be seen from the readiness of participants to learn skills that are relevant to changes in the world of work. Research Das et al (2025) shows that the development of AI encourages workers to do reskilling and upskilling on an ongoing basis. Research Sari, Wahyudin & Rusman (2024) shows that online learning can improve adults' learning readiness because it provides time flexibility and wider access to learning.

The principle of orientation to learning is related to the tendency of adult learners to prefer problem-solving-based learning over theoretical learning. Most studies show that hands-on approaches, simulations, case studies, and problem-based learning are more effective than traditional lecture methods. Research Bahrani (2024) shows that practical learning improves participant skill retention. Research Fengxia Chen & Ailing Lian, (2024) It was also found that training based on adult learning theory was able to improve the work practices of professionals in a real way.

The last principle, motivation to learn, shows that intrinsic motivation is a major factor in adult learning success. Research Fallahi et al (2025) Found that mindfulness, intrinsic motivation, and active participation increased the effectiveness of training evaluations and participant engagement. These findings are reinforced by research Green (2024) explaining that internal motivation and instructor support play an important role in maintaining adult learner engagement.

Implementation Strategy

The implementation of the principle of andragogy in employee training is carried out through several main strategies. The first strategy is the application of self-directed learning through digital-based flexible learning. The use of Learning Management System, online learning, microlearning, and adaptive learning allows participants to learn according to their needs and time. A flexible digital learning environment has been proven to increase participant engagement, encourage self-regulation in learning, and strengthen a culture of continuous learning in the workplace (Amenduni et al., 2022; Bond et al., 2021; Kim, 2022). Research Bayly-Castaneda et al (2024) explained that artificial intelligence (AI) and personalized learning allow the creation of adaptive and personalized learning paths according to the needs and competency development of adult learners. This is also reinforced by research Saputra, Mardhiyah, Fahrezi & Afriza (2024) which confirms that the digitization of learning supports flexibility and collaboration in adult learning.

Adaptive learning is a form of modern andragogy implementation that allows training materials to be tailored to the abilities, needs, experience, and career goals of each participant. Artificial intelligence-based learning systems are able to recommend individual learning materials, activities, and difficulty levels so that the learning process becomes more efficient and meaningful. Bayly-Castaneda, Ramirez-Montoya, & Morita-Alexander (2024) explained that AI-based learning path personalization can improve participant engagement, learning flexibility, and lifelong learning effectiveness. In addition, Goel et al (2024) explained that the use of artificial intelligence in skill development (reskilling and upskilling) allows adult learning to become more personalized through material recommendations, adaptive feedback, and learning paths that are tailored to the competency needs and professional goals of the participants. This condition strengthens the principle of self-directed learning in andragogy because participants have greater autonomy in managing their own learning process (Knowles, 1984).

The development of digital learning technology allows organizations to leverage learning analytics to improve the effectiveness of employee training. Data generated from participants' activities during the learning process, such as learning duration, module completion rate, evaluation results, and participant interaction patterns, can be used to more accurately identify competency development needs and provide more targeted learning interventions. The use of learning analytics also allows organizations to conduct data-driven evaluations of the effectiveness of training programs and predict the need for workforce reskilling and upskilling in the future. According to Goel, Dede, Garn, & Ou (2024) The integration of artificial intelligence and learning analytics in human resource development enables organizations to design learning experiences that are more personalized, adaptive, and oriented to the needs of future competencies. The findings are in line with the principle of andragogy which places the learning needs of adult participants as the main basis in designing relevant and contextual learning experiences (Knowles, 1984; Merriam & Bierema, 2013).

Digital transformation in employee training not only provides easy access to learning materials, but also contributes to increasing the effectiveness of competency development through the use of

learning analytics. The data obtained from the participants' activities can be used to identify training needs more accurately, monitor competency development, and provide learning recommendations that suit individual needs. This condition is in line with the principle of andragogy which places adult learners as individuals who have unique learning needs and are oriented towards solving real problems in work (Merriam & Bierema, 2013).

Artificial intelligence has shifted the paradigm of employee training from a uniform training model to more personalized, adaptive, and sustainable learning. AI technology allows organizations to provide virtual tutors, learning recommendation systems, learning chatbots, and interactive simulations that are able to increase participant engagement during the training process. Goel et al. (2024) states that AI has a strategic role in supporting the reskilling and upskilling process of the workforce through the identification of competency gaps and learning recommendations that suit the needs of individuals and organizations. In addition, Rahman & Singh (2024) stated that the use of generative artificial intelligence in organizational learning allows the provision of a more personalized, adaptive, and competency-oriented learning experience. This technology supports the automatic preparation of learning content, the provision of fast feedback, and the development of more effective workplace learning to improve the quality of training and continuous learning in the work environment. Research Bucher, Schenk, Dolata & Schwabe (2024) It also shows that the use of generative artificial intelligence in the work environment can improve participants' motivation, engagement, and learning experience through more realistic and adaptive learning interactions. Thus, the use of AI not only increases training efficiency, but also strengthens the readiness of the workforce to face the rapidly unfolding digital transformation.

The second strategy is experiential learning-based learning. Training is carried out through work simulations, case studies, mentoring, coaching, and real projects so that participants can connect theory with work practice. Such an experiential approach allows for more effective learning transfer as participants gain the opportunity to test knowledge in an authentic work context. Learning integrated with work experience allows employees to develop competencies through hands-on experience, informal learning, and the application of skills in the workplace to support improved organizational performance (Dixit & Sinha, 2022; Knapke et al., 2024; Tannenbaum & Wolfson, 2022). Research Janchai et al (2019) shows that a real-life task-based approach is effective in improving participants' work readiness. In addition, the research Martins, Jorge & Zorzal (2021) Explains that augmented reality technology can increase the effectiveness of job training through a more interactive and contextual learning experience. The application of the self-directed learning model gives students the freedom to carry out the learning process on the basis of their own initiative, with the characteristics of planning, implementation, and self-evaluation (Sarahono et al., 2024).

From an andragogy perspective, experiential learning has high relevance because adults bring life experience and work experience as the main source of learning. Therefore, a training process that integrates the participant's experience can increase the relevance of the material and strengthen the intrinsic motivation to learn. The learning model that emphasizes hands-on practice also allows participants to develop critical thinking, problem-solving, collaboration, and decision-making skills that are important competencies in the era of digital transformation. Research Morris (2020) It shows that experiential training results in a higher rate of knowledge retention than conventional learning methods because participants are actively involved in the process of knowledge construction and reflection on the experiences gained.

The third strategy is participatory and reflective evaluation. Evaluation is not only carried out by the instructor, but also involves participants' self-reflection regarding the impact of the training on their work. The active involvement of participants in the evaluation process helps to increase learning retention, strengthens awareness of competency development needs, and supports the application of training results in daily work. Evaluations that integrate feedback, reflection, and participant participation have been shown to produce more sustainable training impacts than evaluations that focus solely on instructor assessments (Salas et al., 2012). Research Fallahi et al (2025) shows that participatory

and reflective cultures increase the effectiveness of training evaluations. This approach is in line with the principle of andragogy which places participants as active partners in the learning process, including in assessing the learning success that has been achieved.

Challenges and Solutions

Although the application of andragogy provides many benefits, its implementation still faces various challenges. The first challenge is that traditional pedagogical approaches in corporate training are still dominant. Many trainings are still centered on instructors and one-way delivery of materials so that participants are less actively involved. Research Bahrani (2024) suggests that traditional methods lead to low motivation and learning retention. The solution is to develop training based on the needs of participants with a collaborative approach and problem solving.

The second challenge is the limitations of digital literacy and the technological readiness of participants. Not all workers have the same ability to use digital platforms or AI. Increasing digital literacy is a key prerequisite for adult learning to make optimal use of artificial intelligence, both through personalized learning paths and through reskilling and upskilling programs oriented to the needs of the world of work (Bayly-Castaneda et al., 2024; Goel et al., 2024). Research Mandelize & Sepeng (2024) It also shows that limited facilities, institutional support, and resources are major obstacles in adult learning. Therefore, organizations need to provide technology support, digital basic training, and more inclusive access to learning.

The third challenge is the limited work time and the high workload of employees. Adults often have to balance work, family, and training at the same time. This condition can reduce participation and focus on learning. A workable solution is the use of flexible learning such as microlearning, asynchronous learning, and project-based training so that employees can learn without interrupting their main work activities. Milana et al (2024) explained that artificial intelligence and generative AI have the potential to transform adult education practices through learning that is more personalized, flexible, and centered on the needs of students. In addition, organizational support and a culture of continuous learning are also important factors to increase the successful implementation of the andragogy principle in employee training.

Microlearning is increasingly used in employee training because it is able to answer the time constraints that adult workers have. The delivery of material in small, focused units allows participants to learn specific competencies in a short period of time without interrupting the main work activities. Díaz-Redondo, Caeiro-Rodríguez, López-Escobar, dan Fernández-Vilas (2021) Explaining that the integration of microlearning in digital learning platforms is able to increase learning flexibility, knowledge retention, and participant involvement in the learning process. This approach is very much in line with the principle of andragogy because adult learners tend to need material that is directly relevant to the work problem at hand and can be immediately applied in their professional context (Knowles, 1984; Merriam & Bierema, 2013). In addition to increasing learning flexibility, microlearning also supports a culture of continuous learning in the modern work environment characterized by rapid technological changes and the need for continuous competency development.

4. CONCLUSION

Based on the results of the literature study of the ten journal articles analyzed, it can be concluded that the application of andragogy principles contributes positively to the effectiveness of employee training in the work environment. Principles such as self-directed learning, relevance of material to work needs, utilization of participant experiences, problem-based learning, and intrinsic motivation consistently support increased participant engagement, competency mastery, skill retention, and employee readiness to face organizational changes and technological developments. The findings also show that the integration of digital technology, gamification, and artificial intelligence (AI) further

strengthens the implementation of andragogy through a more adaptive, flexible, and need-centered learning experience for adult learners. Thus, the research objective of analyzing and synthesizing the application of andragogy principles in employee training has been achieved.

This research provides practical implications that training organizations and organizers need to design learning programs that are more participatory, contextual, and oriented to the needs of participants by integrating work experience, independent learning, and the use of digital technology to increase the effectiveness of training. Theoretically, the results of this study strengthen the relevance of andragogy as a suitable approach for the development of human resource competencies in the era of digital transformation.

Further research is recommended to conduct empirical studies in various industrial sectors to test the effectiveness of applying andragogy principles in different organizational contexts. In addition, future research may use systematic literature review or meta-analysis methods with more rigorous methodological quality assessments, as well as explore the integration of andragogy with modern learning technologies, such as adaptive learning, gamification, and Artificial Intelligence (AI), to obtain more comprehensive empirical evidence regarding its impact on employee competence, engagement, and performance.

REFERENCES

- Amenduni, F., Ryymin, E., Maetoloa, K., & Cattaneo, A. (2022). Facing Disruptive Changes With Informal Workplace Learning Strategies : The Experience of European Companies. *Frontiers in Psychology*, 13, 1–16. <https://doi.org/10.3389/fpsyg.2022.889850>
- Bahrani, B. (2024). Applying Andragogy Principles to Enhance Professional Development in Corporate Training Programs. *Journal of Social Science Utilizing Technology*, 2(3), 415–429. <https://doi.org/10.70177/jssut.v2i3.1345>
- Bayly-Castaneda, K., Ramirez-Montoya, M.-S., & Morita-Alexander, A. (2024). Crafting personalized learning paths with AI for lifelong learning : a systematic literature review. *Frontiers in Education*, 9, 1–12. <https://doi.org/10.3389/educ.2024.1424386>
- Bond, M., Bedenlier, S., Marín, V. I., & Händel, M. (2021). Emergency Remote Teaching in Higher Education: Mapping the First Global Online Semester. *International Journal of Educational Technology in Higher Education*, 18(50), 1–24. <https://doi.org/10.1186/s41239-021-00282-x>
- Bucher, A., Schenk, B., Dolata, M., & Schwabe, G. (2024). When Generative AI Meets Workplace Learning: Creating A Realistic & Motivating Learning Experience With A Generative PCA. *ArXiv*, abs/2405.15561.
- Creswell, J. W. (2022). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Sage Publications Inc.
- Das, S., Bhoi, C., & Behera, B. (2025). Andragogy in the Age of AI Redefining Adult Learning for the Future Workforce. *International Journal of Humanities Social Science and Management*, 5(5), 60–68.
- Díaz-Redondo, R. P., Caeiro-Rodríguez, M., López-Escobar, J. J., & Fernández-Vilas, A. (2021). Integrating micro-learning content in traditional e-learning platforms. *Multimedia Tools and Applications*, 80(2), 3121–3151. <https://doi.org/10.1007/s11042-020-09523-z>
- Dixit, R., & Sinha, V. (2022). Investigating tools and techniques to promote workplace training transfer. *Journal of Workplace Learning*, 34(6), 513–531. <https://doi.org/10.1108/JWL-04-2021-0052>
- Fallahi, M., Rezaei, A. M., & Delavarpour, M. A. (2025). A Study of Corporate Training Evaluation Using Andragogy Principles. *Iranian Journal of Educational Sociology*, 8(3), 1–10. <https://doi.org/10.61838/kman.ijes.8.3.19>
- Fengxia Chen, M., & Ailing Lian, P. (2024). Applying Adult Learning Theory in Improving Knowledge, Attitude, and Practice of Inadvertent Perioperative Hypothermia in Operating Room Nurses: Single-Group “Before and After Study.” *Therapeutic Hypothermia and Temperature Management*,

- 14(4), 252–257. <https://doi.org/10.1089/ther.2023.0072>
- Goel, A., Dede, C., Garn, M., & Ou, C. (2024). AI-ALOE: AI for reskilling, upskilling, and workforce development. *AI Magazine*, 45, 77–82. <https://doi.org/10.1002/aaai.12157>
- Green, D. N. (2024). Adult Learners: Connecting Andragogy and Transformational Leadership in the Classroom. *Business Ethics and Leadership*, 8(4), 137–147. [https://doi.org/10.61093/bel.8\(4\).137-147.2024](https://doi.org/10.61093/bel.8(4).137-147.2024)
- Janchai, W., Siddoo, V., & Sawattawee, J. (2019). Andragogical Teaching Patterns Appropriate For Work-Integrated Learning in The Information Technology Industry. *International Journal of Work-Integrated Learning*, 20(3), 283–299.
- Kim, S. (2022). Innovating workplace learning : Training methodology analysis based on content, instructional design, programmed learning, and recommendation framework. *Frontiers in Psychology*, 13, 1–14. <https://doi.org/10.3389/fpsyg.2022.870574>
- Knapke, J. M., Hildreth, L., Molano, J. R., Schuckman, S. M., Blackard, J. T., Johnstone, M., Kopras, E. J., Lamkin, M. K., Lee, R. C., Kues, J. R., & Mendell, A. (2024). Andragogy in Practice: Applying a Theoretical Framework to Team Science Training in Biomedical Research. *British Journal of Biomedical Science*, 81(3), 1–8. <https://doi.org/10.3389/bjbs.2024.12651>
- Knowles, M. (1983). *Andragogy: an Emerging Technology for Adult Learning*. Routledge.
- Knowles, M. (1984). *The Adult Learner: A Neglected Species*. Gulf Publishing Company.
- Mandelize, P. N., & Sepeng, M. S. (2024). Exploring Challenges of Adult Learners in Selected Adult Education and Training Centers in South Africa : An Analysis of Knowles’ Theory of Andragogy. *Social Sciences and Education Research Review*, 11(1), 152–160. <https://doi.org/10.5281/zenodo.15258155>
- Martins, B. R., Jorge, J. A., & Zorzal, E. R. (2021). Towards Augmented Reality for Corporate Training. *Interactive Learning Environments*, 31(4), 2305–2323. <https://doi.org/10.1080/10494820.2021.1879872>
- Melliofatria, Mahdum, Hadriana, & Purwanti, I. T. (2024). Models for Andragogy: a Systematic Review and Meta-Analysis. *Evolutionary Studies in Imaginative Culture*, 8(1), 583–589. <https://doi.org/10.70082/esiculture.vi.757>
- Merriam, S. B., & Bierema, L. L. (2013). *Adult Learning: Linking Theory and Practice*. San Francisco, CA: Jossey-Bass.
- Milana, M., Brandi, U., Hodge, S., & Hoggan-klobert, T. (2024). Artificial intelligence (AI), conversational agents, and generative AI : implications for adult education practice and research. *International Journal of Lifelong Education*, 43(1), 1–7. <https://doi.org/10.1080/02601370.2024.2310448>
- Miles, M. B., Huberman, A. M., & Saldana, J. (2013). *Qualitative Data Analysis: A Methods Sourcebook*. Sage Publications.
- Morris, T. H. (2020). Experiential Learning – a Systematic Review and Revision of Kolb’s Model. *Interactive Learning Environments*, 28(8), 1064–1077. <https://doi.org/10.1080/10494820.2019.1570279>
- Nallaluthan, K., Masran, M. N., Thurasingam, V., & Kanapathy, K. (2023). Malcolm Knowles’ Theory of Andragogy at Research Management and Innovation Centre Universiti Pendidikan Sultan Idris (RMIC-UPSI): Work-Based Learning Model. *Evaluation Studies in Social Sciences (ESSS)*, 4(2), 30–49. <https://doi.org/10.37134/esss.vol4.2.4.2023>
- Ogienko, O., & Lytovchenko, I. (2017). Andragogy as Theoretical Basis of Corporate Training in American Companies. *Edukacja – Technika – Informatyka*, 22(4), 97–102. <https://doi.org/10.15584/eti.2017.4.12>
- Rahman, H., & Singh, T. (2024). Generative artificial intelligence: opportunities, challenges and future avenues for organizational learning. *Development and Learning in Organizations: An International Journal*, 39(2), 3–7. <https://doi.org/10.1108/DLO-04-2024-0101>
- Rahmawati, Y. I., & Hiryanto. (2023). Implications Of The Andragogy Concept In Various Community Education Settings: A Literature. *EMPOWERMENT : Jurnal Ilmiah Program Studi Pendidikan Luar Sekolah*, 12(2252), 85–96. <https://doi.org/10.22460/empowerment.v12i2.3916>

- Rodrigo, C., Iniesto, F., & Garcia-serrano, A. (2024). Applying andragogy for integrating a MOOC into a formal online learning experience in computer engineering. *Heliyon*, 10(1), e23493. <https://doi.org/10.1016/j.heliyon.2023.e23493>
- Salas, E., Tannenbaum, S. I., Kraiger, K., & Smith-Jentsch, K. A. (2012). The Science of Training and Development in Organizations: What Matters in Practice. *Psychological Science in the Public Interest: A Journal of the American Psychological Society*, 13(2), 74–101. <https://doi.org/10.1177/1529100612436661>
- Sánchez-Domenech, I., & Cabeza-Rodríguez, M. A. (2024). Andragogía Digital: Necesidad De Saber Y Papel De La Experiencia En Un Máster Universitario En Línea. *RIED-Revista Iberoamericana de Educación a Distancia*, 27(2), 357–382. <https://doi.org/10.5944/ried.27.2.38799>
- Saputra, A., Mardhiyah, Fahrezi, D. W., & Afriza. (2024). Andragogi : Adaptasi Pembelajaran Orang Dewasa pada Era Digitalisasi. *Jurnal Studi Islam Dan Humaniora*, 4(2), 501–513. <https://doi.org/10.37680/almikraj.v4i02.4528>
- Sarahono, F. R., Lase, A., Laoli, B., & Laoli, E. S. (2024). Penerapan Model Pembelajaran Self Directed Learning (SDL) untuk Meningkatkan Hasil Belajar Siswa. *Jurnal Penelitian, Pendidikan Dan Pengajaran (JPPP)*, 5(2), 218–224. <https://doi.org/10.30596/jppp.v5i2.20962>
- Sari, I. N., Wahyudin, D., & Rusman. (2024). Analysis of E-learning Implementation in Adult Learning (Andragogy). *Inovasi Kurikulum*, 21(2), 1027–1040. <https://doi.org/10.17509/jik.v21i2.66034>
- Stanney, K. M., Skinner, A., & Hughes, C. (2023). Exercisable Learning-Theory and Evidence-Based Andragogy for Training Effectiveness using XR (ELEVATE-XR): Elevating the ROI of Immersive Technologies. *International Journal of Human–Computer Interaction*, 39(11), 2177–2198. <https://doi.org/10.1080/10447318.2023.2188529>
- Sugiyono. (2021). *Metode Penelitian Pendidikan, Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
- Sumarni, T., & Sudira, P. (2022). The Role of The Heutagogy Approach in Advanced Adult Education as Rebuilding The Vocational Self-Concept in The Industrial Era 4.0 and Society 5.0. *Jurnal Pendidikan Vokasi*, 12(2), 199–211. <https://doi.org/10.21831/jpv.v12i2.49132>
- Tannenbaum, S. I., & Wolfson, M. A. (2022). Informal (Field-Based) Learning. *Annual Review of Organizational Psychology and Organizational Behavior*, 9, 391–414. <https://doi.org/10.1146/annurev-orgpsych-012420-083050>
- van der Stap, N., van den Bogaart, T., van Ginkel, S., Rahimi, E., & Versendaal, J. (2024). Towards teaching strategies addressing online learning in blended learning courses for adult-learners. *Computers and Education*, 219, 105103. <https://doi.org/10.1016/j.compedu.2024.105103>
- Yahya, I. B., Purnama, S., & Supeno. (2024). Eksplorasi Prinsip Andragogi dalam Pendidikan Orang Dewasa : Sebuah Studi Kualitatif pada Pendidikan Formal dan Non-Formal di STIP Jakarta. *PTK: Jurnal Tindakan Kelas*, 5(1), 136–152. <https://doi.org/10.53624/ptk.v5i1.505>
- Yuliani, L., Hufad, A., Komar, O., Karwati, L., & Hamdan, A. (2024). Andragogy Training Model in Advanced Level Training by Early Childhood Educators to Improve Learning. *Journal of Nonformal Education*, 10(2), 392–401. <https://doi.org/10.15294/jone.v10i2.12358>
- Zainuddin, Z., Chu, S. K. W., & Othman, J. (2024). The Evaluation of Gamification Implementation for Adult Learners: a Scale Development Study Based on Andragogical Principles. *Education and Information Technologies*, 29(14), 18591–18620. <https://doi.org/10.1007/s10639-024-12561-x>
- Zainuddin, Z., Rasyidin, R., Zanzibar, Z., Aruni, F., & Nurmasyahyati, N. (2023). Andragogical principles in a gamification concept: how does it work for adult learners in an online class? *Journal of Applied Research in Higher Education*, 15(5), 1632–1648. <https://doi.org/10.1108/JARHE-04-2022-0127>