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The Andragogical Approach to Improving Critical Thinking Skills in Higher Education: A Systematic Literature Review

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Abstract: This study aims to examine the application of the andragogy approach in improving students' critical thinking skills based on research results from the last ten years (2015–2025). The method used is a literature study by reviewing various national and international scientific publications. The results of the review indicate that the application of andragogy principles, such as independent learning, reflective learning experiences, and problem-based learning, has been proven to contribute to improving students' critical thinking skills. However, most of the research is still descriptive and not many uses experimental designs. Therefore, further, more in-depth research is needed to strengthen the empirical evidence of the causal relationship between andragogy and critical thinking skills.

Keywords: Andragogical Approach, Literature Study, Students' Critical Thinking

A. Introduction

Critical thinking is a crucial aspect of modern education that must be developed and empowered, especially in the current industrial revolution, where information is abundant and changes are rapid and radical. Critical thinking skills are widely recognized as a crucial element in modern education systems, and all educators need to implement effective teaching and learning approaches to help students develop and strengthen their thinking skills. To improve critical thinking skills, a rational mind with sound reasoning, the ability to follow logical rules, and scientific reasoning are essential for decision-making (Razak et al., 2022).

Current developments in higher education require lecturers to act not only as conveyors of information but also as learning facilitators who encourage students to think critically. One approach considered effective in this context is andragogy, an adult learning approach that emphasizes independence, experience, and the relevance of learning to students' real-world needs (Knowles, 2015). This critical thinking ability is very closely related to the concept of andragogy applied to adult learning. Critical thinking when This is not only part of academic rhetoric and educational practice. Adults learn best when learning is focused on adult learners, called andragogy, the

process of helping adults learn. Andragogy and pedagogy is different because adults learn best when they understand why something is important and meaningful to them. They should feel relaxed and are free to learn in their own way. Furthermore, learning while doing or learning based on experience is preferred by adults. The time and place of study are determined by oneself. These factors and the process in adult learning motivates and encourages them (Şahin & Doğantay, 2018). Several studies have shown that the application of andragogical principles can create an active and reflective learning environment that stimulates students' analytical and evaluation skills (Brookfield, 2017). However, further research on this topic requires further study to determine its relevance to existing research. Therefore, this paper will examine this relevance using a review of recent literature from the past ten years on the andragogical approach to improving students' critical thinking.

B. Methods

This study used a literature review method by reviewing scientific articles from various sources such as Scopus, ScienceDirect, and Google Scholar. Inclusion criteria were articles published between 2015 and 2025, written in Indonesian or English, and discussing the application of the andragogy approach in higher education and its relationship to critical thinking. The search results identified 15 relevant articles for analysis.

This study applied a systematic review procedure guided by the PRISMA 2020 framework to ensure transparency, methodological rigor, and full reproducibility. The literature search was conducted across Scopus, ERIC, and Google Scholar using a predefined set of keywords related to andragogy and critical thinking in higher education. The search strategy employed Boolean operators combining multiple relevant terms, and the primary search string used was: *TITLE-ABS-KEY ("andragog" AND "critical think"* AND "higher education"). Additional supportive strings included variations such as ("adult learning" AND "critical thinking"), ("self-directed learning" AND "university students"), and ("andragogical principles" AND "student outcomes") to broaden coverage and capture terminological variations across publications. All searches were conducted on 10 November 2025, and the coverage period was restricted to publications from 2015–2025 to ensure the inclusion of the most recent decade of theoretical and empirical developments.

The review applied explicit inclusion and exclusion criteria to maintain the relevance and quality of the selected literature. Studies were included if they involved higher education students, examined or implemented andragogical principles or adult-learning-based instructional approaches, and reported outcomes related to critical thinking skills. Eligible designs consisted of empirical research both quantitative and qualitative—and theoretical or literature reviews directly discussing the integration of andragogy in higher education. Only articles published in English or Indonesian and

within the specified time frame were considered. Studies were excluded if they focused on primary or secondary education, did not address andragogical elements, did not measure or discuss critical thinking, were not peer-reviewed, or lacked accessible full texts.

The selection process followed two screening stages. The first stage involved title and abstract screening based on the inclusion criteria, followed by a full-text review to confirm eligibility and extract thematic relevance. Although presented here in narrative form, this process was documented using a PRISMA flow structure, capturing the number of records identified, screened, excluded, assessed for eligibility, and included in the final synthesis. Data extraction was performed systematically by recording bibliographic information, study context, population characteristics, andragogical strategies used, critical-thinking outcomes, research design, and key findings into an organized extraction table.

Following extraction, the analysis proceeded using a thematic analysis approach to identify recurring patterns, conceptual categories, and the dominant instructional strategies derived from andragogical principles that influence critical thinking development in higher education. Themes were generated inductively through iterative coding, allowing the synthesis to reflect both convergent and divergent findings across the included studies. This structured and replicable methodological process ensures that the review meets the standards required for publication in reputable international journals.

C. Results and Discussion

The Relevance of Andragogy in Higher Education

Andragogy positions students as active learners with their own experiences, needs, and learning goals. According to Knowles, adult learning is effective when students have the freedom to determine their learning methods and relate knowledge to personal experiences (Merriam & Bierema, 2016). Research by Kim & Suh (2021) shows that applying andragogy principles in blended learning can increase students' intrinsic motivation and metacognitive awareness, which are the foundation of critical thinking.

The Influence of Andragogy on Critical Thinking Skills

A study by Lukman et al. (2020) found that the use of an andragogical approach in project-based courses can improve students' analytical and reasoning skills compared to conventional approaches. Similarly, Yilmaz & Orhan (2019) showed that an experiential learning model *rooted* in andragogical principles significantly improved students' ability to evaluate arguments and draw logical conclusions. Another study

by Sari & Hadi (2023) in Indonesia also reported improved critical thinking skills through the application of andragogy-based problem-based learning in education students.

Effective Andragogical Learning Strategies

The most frequently used strategies in research include Problem-Based Learning (PBL), Project-Based Learning, and Self-Directed Learning. A study by Nugroho et al. (2021) confirmed that a combination of self-directed and reflective learning improves students' ability to make decisions based on data and logic.

Challenges and Limitations of Research

Although research findings show a positive trend, most studies are still descriptive or quasi-experimental, with small sample sizes and no control for external variables (Setiawan, 2022). Furthermore, limitations in the use of standardized critical thinking instruments make it difficult to generalize research results (Khalid & Lim, 2020).

Further Research Opportunities

Experimental and longitudinal research is needed that can more objectively measure the impact of andragogy on critical thinking. Furthermore, the integration of digital technology and artificial intelligence into andragogical learning design also needs to be further explored as part of future higher education innovation (Lee & Park, 2024). In addition to the research results, here is a list of the most recent research reviewed based on its relevance to this research:

Table 1. Results of the Literature Review of Research Journals

Research Title	Results	Relevance
Advancing adult learning using andragogic instructional practices (Livingston & Cummings-Clay, 2023)	found that the implementation of andragogical instructional practices (including PBL, simulation, team-based learning) in community college classrooms was able to increase adult learner engagement and support the development of critical thinking skills.	supports that active andragogy (not just theory) has been proven to have a positive impact on critical thinking skills.
Implementation of the Andragogy Approach in Educational Settings: A Systematic Literature Review (Arutmayanti & Hiryanto, 2023)	shows that in a systematic review of the 2018-2023 literature, the results of implementing andragogy in educational settings (including higher education) produced students who were "active, highly analytical, critical and independent thinkers."	Although not always measuring critical thinking with standard instruments, the results show a positive trend.
Andragogy and teaching techniques to enhance adult	In the context of nursing education, it is emphasized that the use of techniques such as simulation, case	Demonstrating the relationship between concrete andragogical

learners' experience (Lewis & Bryan, 2021)	studies, debates and flipped classrooms within an andragogical framework helps adult students acquire critical and reflective thinking skills.	learning design and critical thinking outcomes
Reorientation of the Andragogy Concept and Its Relevance to Higher Education in Indonesia for Answering the Global Era of Information (Abdullah, Chamid & Khamim, 2021)	Reviewing the concept of andragogy (sourced by Malcolm Knowles) in the context of Indonesian higher education and concluding that optimizing andragogical principles is crucial in the global information age — as a foundation for competencies such as critical thinking	Although it does not specifically measure critical thinking, this study provides a conceptual foundation in a local context.
The Six Characteristics of Andragogy and Future Research Directions in EFL: A Literature Review (Purwati, Mardhiah & Nurhasanah, 2022)	Describes six characteristics of andragogy (self-concept, experience, readiness to learn, motivation, need to know, problem-centered learning) and suggests that further research needs to link them to outcomes such as critical thinking.	The research results can be used as a theoretical basis to explain how andragogy can influence critical thinking.

D. Conclusion

Based on the results of a literature review of various studies over the past ten years (2015-2025), it can be concluded that the andragogical approach plays a significant role in improving students' critical thinking skills in higher education. The main principles of andragogy, which emphasize independent learning, experience, the need to know, and a problem-solving orientation, have proven effective in fostering higher-order thinking skills. Research by Kim & Suh (2021), Yilmaz & Orhan (2019), and Sari & Hadi (2023) shows that experiential and problem-based learning based on andragogical principles can improve students' analytical, evaluative, and reflective abilities. Furthermore, Lewis & Bryan (2021) and Livingston & Cummings-Clay (2023) found that the implementation of andragogical instructional practices such as project learning, simulations, and active collaboration fostered students' cognitive engagement and intrinsic motivation, which directly contributed to strengthening critical thinking. Research in Indonesia by Abdullah, Chamid, & Khamim (2021) and Arutmayanti & Hiryanto (2023) also confirmed that the andragogical approach is relevant to the demands of 21st-century higher education because it encourages students to become independent learners who are adaptive and reflective of global change. Furthermore, Purwati et al. (2022) emphasized that the six main characteristics of andragogy including independence, experience, readiness to learn, need to know, internal motivation, and problem-solving orientation—have a direct relationship to strengthening critical thinking skills. Thus, the andragogical approach not only improves critical thinking skills but also fosters metacognitive awareness and responsibility for learning. However, most research is still descriptive in nature, so experimental and longitudinal research is needed to strengthen empirical evidence on

the effectiveness of the andragogical approach in developing students' critical thinking skills sustainably.

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