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Professional reconversion to ensure a better professional future

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Chapter 2
Critical thinking

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Introduction

Critical thinking is more essential than ever in today's world, which is characterised by a variety of communication channels and the emergence of new professions with an emphasis on innovation. Employers value employees who can plan and organise, approach a problem methodically, and think critically by considering the repercussions of various options. Therefore, adult educators are required to place a greater emphasis on cultivating critical thinking in their learners, not only to adequately prepare them for the demands of the workplace but also to foster their active participation in civic engagement and responsible decision-making in their personal lives. This section aims to define critical thinking and explain how adult educators can assist learners in developing/improving their critical thinking skills.

Learning objectives

Learners will be able to:

- understand what critical thinking is;
- understand the importance of critical thinking in modern life;
- learn about teaching approaches to critical thinking;
- learn about good practices and applications of critical thinking in adult education.

2.1. What is critical thinking?

2.1.1. Definition

There are many definitions of critical thinking, and different scholars and researchers may emphasise different aspects of the concept. However, there are some common threads that run through many of these definitions, such as the importance of reasoning, evaluation, and self-reflection.

One recent definition of critical thinking comes from the American Psychological Association (APA) which states that critical thinking is "the process of purposeful, self-regulatory judgement that uses cognitive tools such as interpretation, analysis, evaluation, inference, and explanation of the evidential, conceptual, methodological, or contextual considerations on which judgments are based" (Facione, 2019). This definition highlights the idea that critical thinking involves purposeful and intentional thinking processes, as well as the use of various cognitive tools to analyse and evaluate information. Additionally, it emphasises the role of self-regulation in the critical thinking process.

Another recent study by Panadero et al. (2021) highlighted the importance of metacognition in critical thinking. Metacognition refers to the ability to reflect on one's own thinking processes, and the study found that higher levels of metacognition were positively correlated with better

critical thinking skills. This suggests that being aware of and actively regulating one's own thinking processes can enhance critical thinking abilities.

2.1.2.. Characteristics

Critical thinking requires active engagement with ideas, exploration of diverse perspectives, and the examination of our own biases and preconceptions. Critical Thinking is characterised by the following characteristics:

1. **Analysing information:** Critical thinking begins with a thorough examination of the presented information. It requires dissecting complex ideas, identifying essential components, and assessing their relevance and credibility. By analysing data, facts, and arguments critically, individuals can acquire a deeper understanding of the topic and make informed decisions.

2. **Evaluating arguments:** Thinking critically requires us to evaluate the validity of arguments and claims. It is the process of recognising logical fallacies, biases, and inconsistencies in reasoning. Individuals can distinguish valid arguments from those lacking validity by examining the supporting evidence and rationale. This enables them to form well-grounded opinions and make judicious decisions.

3. **Questioning assumptions:** Critical thinkers never hesitate to challenge assumptions. They question established norms, preconceived notions, and conventional wisdom. They uncover concealed biases, unexamined beliefs, and defective reasoning by delving deeper. Inquiring into presumptions paves the way for novel insights and inventive solutions.

4. **Considering multiple perspectives:** Critical thinking encourages us to consider diverse perspectives and to look beyond our own perspectives. Individuals acquire a deeper understanding of complex issues by actively seeking out diverse viewpoints and engaging in thoughtful conversation. This promotes empathy, tolerance, and an inclusive problem-solving approach.

5. **Problem-solving and decision-making:** Critical thinking is fundamentally a problem-solving skill. It enables us to deconstruct complex problems into smaller parts, analyse each of them, and devise well-reasoned solutions. By employing critical thinking to decision-making, individuals can mitigate risks, anticipate consequences, and make decisions that are in line with our objectives.

Critical thinking is a lifelong process that enables individuals to make rational, well-informed decisions. It is a skill that can be developed and honed through repeated practice.

2.1.3. Values

When we reflect on the characteristics of critical thinking, we can appreciate its value. Critical thinkers "train" their minds to understand, analyse, assess, decide, and through this process, they acquire values important for their personal, academic, and professional life. Critical thinkers recognize the thinking process and take control of their own thinking, excluding biases, opinions, or feelings. They learn to question their own thoughts so that they can make better decisions, sort important details, excluding irrelevant ones to make logical deductions, understand people's motivations and opinions, and they know when to take them into consideration. The values of critical thinking are numerous, and they include the following:

- **Clarity:** Critical thinking values clarity of thought and expression. Clarity, the first and most essential stage in critical thinking, involves understanding the issue, problem, goal, or objective you're attempting to solve.
- **Accuracy:** Critical thinking values accuracy in reasoning and decision-making. It encourages individuals to seek out and evaluate evidence objectively, without bias or preconceived notions (Paul & Elder, 2019).
- **Relevance:** Critical thinking values relevance in evaluating information. It emphasises the importance of determining whether information is pertinent to the issue at hand and avoiding irrelevant information (Paul & Elder, 2019).
- **Depth:** Critical thinking values depth of analysis. It encourages individuals to examine issues thoroughly and to consider multiple perspectives and possible outcomes (Paul & Elder, 2019).
- **Logic:** Critical thinking values logical reasoning. It emphasises the use of sound reasoning to draw conclusions and make decisions (Paul & Elder, 2019).
- **Precision:** Critical thinking values precision in language and thought. It encourages individuals to use clear and precise language and to be specific in their descriptions and explanations (Paul & Elder, 2019).
- **Open-mindedness:** Critical thinking values open-mindedness. It encourages individuals to consider alternative perspectives and to be willing to change their views based on new evidence (Paul & Elder, 2019).
- **Intellectual humility:** Critical thinking values intellectual humility. It encourages individuals to recognize the limits of their knowledge and to be open to learning from others (Paul & Elder, 2019).
- **Curiosity:** Critical thinking values curiosity. It encourages individuals to ask questions and to seek out information to better understand the world around them (Ennis, 1987).

2.1.4. The Importance of critical thinking in modern life

Critical thinking has been identified as one of the key 21st-century skills that are highly relevant to the labour market (Rave et al. 2020; Whiting 2020). Reports by reputable organisations such as the World Economic Forum, Partnership for 21st Century Skills, Association of American Colleges and Universities, and the Organization for Economic Cooperation and Development have all emphasised the importance of critical thinking for success in the workplace. According to these reports, critical thinking involves the ability to analyse, evaluate, and synthesise information from a variety of sources and perspectives to make sound decisions and solve complex problems. Employers value this skill as it helps individuals to think objectively, make rational decisions, and innovate in a rapidly changing work environment.

Moreover, research has shown that the ability of an organisation's employees to respond quickly to changing situations and make reasoned, research-based decisions is a key determinant of its success (Penkauskiene et al., 2019; Powley and Taylor 2014; Phan 2011; Fung 2014). In today's fast-paced and complex business environment, organisations need to be agile and adaptive to stay competitive, and this requires employees who can think critically and make informed decisions based on evidence and data. As argued by Elicor (2017), critical thinking can be an indispensable tool in the administration of organisations, aiding in the discovery of numerous practical solutions when operating in contemporary market conditions that demand a consistently high level of competitiveness and efficacy.

The ability to generate new ideas and challenge old beliefs is increasingly important for employees in today's fast-changing business environment. According to Desai et al. (2016), employees need to be able to think creatively and be willing to challenge the status quo to contribute to their organisation's success. Similarly, Subramanian (2020) highlights the importance of developing new ideas and approaches as a means of gaining a competitive advantage. Critical thinking is a key skill that enables employees to analyse and evaluate information from different sources (Sousa and Wilks, 2018) and to consider the situation being analysed from multiple perspectives (Wang and Zheng, 2016; Reed, 2018). By applying critical thinking skills, employees can identify opportunities for innovation and improvement, challenge assumptions, and develop new solutions to complex problems. In summary, critical thinking is an essential skill for employees who want to succeed in today's fast-paced and competitive business environment, as it allows them to generate new ideas and contribute to their organisation's success.

However, critical thinking as a skill is not limited to the workplace. In contemporary daily life, critical thinking is essential because it facilitates healthy relationships. Through critical thinking, a person becomes more tolerant and open-minded, and their ability to listen to the perspectives of others increases, allowing them to be a better companion, friend, relative, or coworker. It aids in the development of empathy by encouraging individuals to consider the problems of others and attempt to help them.

2.2. Teaching Approaches to critical thinking

2.2.1. Teaching Critical Thinking

Teaching Critical Thinking can be a challenging task, but there are several effective approaches that educators can use to foster critical thinking skills in their learners.

A dialogue-based teaching approach encourages learners to question assumptions and beliefs, challenge arguments, and evaluate evidence. Adult trainers can use this method to promote critical thinking by asking open-ended questions. One such approach is the Socratic method, which is a powerful dialogue-based teaching approach that has been found effective for teaching critical thinking. This method involves asking a series of questions to stimulate discussion and encourage students to think critically about a particular topic or issue. By using probing questions, the Socratic method encourages students to question assumptions, analyse evidence, and consider multiple perspectives. This approach can promote higher-order thinking skills, including analysis, synthesis, and evaluation (Paul & Elder, 2022). Research has shown that the Socratic method can enhance students' critical thinking skills, increase engagement, and improve academic performance (Bailin, Case, Coombs, & Daniels, 1999). By using the Socratic method, teachers can create a classroom environment that fosters critical thinking and helps students develop the skills they need to succeed academically and professionally.

Problem-based learning (PBL) is a learner-centred teaching approach that promotes critical thinking by engaging learners in real-world problems or scenarios. PBL involves a series of activities that encourage learners to work collaboratively, identify relevant information, analyse the problem, and develop and implement solutions (Savin-Baden & Major, 2013). Research has shown that PBL is an effective way to develop critical thinking skills and improve academic performance (Hmelo-Silver, 2004). PBL can also improve learners' motivation, engagement, and retention of knowledge (Maudsley & Strivens, 2000). One of the strengths of PBL is that it can be adapted to different disciplines and levels of education (Duch, Groh, & Allen, 2001).

Collaborative learning, which involves group work and encourages learners to work together to solve problems, share ideas, and provide feedback. According to a study by Johnson and Johnson (1994), this approach promotes critical thinking by exposing learners to different perspectives and encouraging them to consider multiple viewpoints.

Inquiry-based learning, which involves asking students to investigate a question or problem, and to develop solutions based on their analysis and evaluation of the information gathered. According to a study by Hmelo-Silver (2004), Inquiry-Based Learning was found to be effective in developing critical thinking skills in students.

Case-based learning, which involves presenting students with real-world scenarios or cases, and asking them to analyse and evaluate the information provided to develop solutions. According to a study by Miller and colleagues (2018), Case-Based Learning was found to be effective in developing critical thinking skills in students.

2.2.2. Challenges / Barriers

Critical thinking in education faces various challenges and barriers that hinder its development and application. Some of the key challenges and barriers in education related to critical thinking are:

- **Limited time and resources:** One of the most significant barriers to critical thinking in education is the limited time and resources available for teaching and learning. Adult trainers often have to cover a vast curriculum within a short period, leaving little time for critical thinking exercises and discussions. When people are pressed for time, they may rely on heuristics or shortcuts to make judgments, which can lead to errors or biases. (Kahneman, 2011). Not to mention that educational institutes may not have the resources to provide them with the materials and tools necessary to teach critical thinking effectively.

- **Resistance to change:** Some adult trainers may be resistant to changing their teaching methods to incorporate critical thinking skills. They have conservative ideas and traditional values which are difficult to change (adult trainer centred approaches, strictly controlled classrooms e.t.c.). This can be a significant barrier to critical thinking because it can prevent people from considering alternative perspectives or evidence that contradicts their own beliefs. (Nickerson, 1998). And others may be reluctant to provide so much freedom to their learners, to allow them to express their opinions or even judge others' opinions, even when it is in a democratic way.

- **Cognitive overload:** When people are presented with too much information at once, they may become overwhelmed and find it difficult to process and evaluate the information effectively. This can be mentally exhausting for some learners and can hinder critical thinking and lead to errors in judgement (Sweller, 2010). Imagine adult learners, who have so much incoming information usually in a short time! Although they need it, it may become a hindrance for critical thinking.

- **Lack of information:** Critical thinking requires a sufficient amount of information to make informed decisions. When information is incomplete or insufficient, it can be difficult to analyse a situation or make a decision based on evidence (Halpern, 1998). And without knowledge, it can be difficult to evaluate information effectively and make informed judgments. (Kuhn, 1991)

- **Overcoming learners' preconceptions and beliefs:** Many learners may be resistant to questioning their assumptions and may prefer to rely on their own intuition or beliefs rather than engaging in critical thinking. Confirmation bias is the tendency to seek out and interpret information in a way that confirms one's existing beliefs. This can be a significant barrier to critical thinking, especially for adults who have more set ideas, difficult to change. It can prevent people from considering alternative perspectives or evidence that contradicts their own beliefs. (Nickerson, 1998) Additionally, critical thinking requires a significant amount of cognitive effort. Furthermore, learners are exposed to a limited range of viewpoints, so they may struggle to think critically about complex issues and problems.

- **Cultural, societal, and language barriers:** Learners from different cultures and with different language backgrounds may have different approaches to critical thinking, making it challenging to teach them in a way that is effective for all learners. Or others, due to societal exclusions, may not be familiar with the topics discussed or may not have a variety of opinions to support, or may not have had the same opportunities to exercise discussion skills.

Finally, adult trainers may struggle to design a methodology appropriate to a critical thinking class. Open discussion, teaching how to be argumentative or to analyse and synthesise ideas, may be challenging. Adult trainers might also have difficulties assessing critical thinking skills effectively. Traditional assessments, such as multiple-choice tests, may not accurately capture learners' critical thinking abilities. Adult trainers may need to use more authentic assessments, such as writing assignments and projects, to evaluate learners' critical thinking skills.

Therefore, we recognize the significance of the role of adult educators in mitigating the effects of these obstacles, identifying methods for overcoming them with the previously mentioned approaches, and modifying the way they teach to create the conditions for adult learners to develop critical thinking skills.

2.2.3. The role of the educator

Educators play a crucial role in cultivating a mindset that enables learners to think independently, challenge presumptions, and analyse information critically. In particular, educators are responsible for:

- **Creating a supportive environment:** It is essential for educators to establish a safe and inclusive learning environment that promotes open dialogue, respectful debate, and the exploration of diverse perspectives. By cultivating empathy and active listening skills, educators ensure that all learners feel heard and valued. This inclusive approach fosters a sense of belonging, empowering learners to express their thoughts, pose challenging questions, and actively engage in discussions.

- **Promoting active engagement:** By encouraging active engagement and moving away from traditional lecture-based instruction, educators facilitate discussions, group activities, and problem-solving exercises that encourage learners to actively participate in their own learning. In this way they encourage a deeper comprehension of concepts and independent thought, as well as critical thinking.

- **Providing guidance and mentorship:** On the path to critical thinking, educators can serve as mentors and guides. Educators can help learners refine their critical thinking skills by providing guidance, asking thought-provoking questions, and challenging learners to delve deeper into their thought processes.

- **Incorporating real-world scenarios:** Educators can connect critical thinking skills to real-world scenarios, demonstrating to learners the practical value of critical skills. By

incorporating current events, case studies, and real-life scenarios into the curriculum, educators prepare learners for the challenges they will encounter in their future endeavours.

To conclude, by fostering a culture of inquiry, curiosity, and intellectual independence, educators empower learners to become lifelong critical thinkers who can adapt, innovate, and make significant contributions to society.

2.2.4. Characteristics of a critical thinking classroom

A critical thinking classroom is a learning environment that encourages learners to develop their reasoning skills and to think deeply about the material they are studying. Here are some of the key characteristics of a critical-thinking classroom:

- **Active engagement:** In a critical-thinking classroom, learners are actively engaged in their learning. They are encouraged to participate in discussions and debates, ask questions, and challenge assumptions. Research has shown that active learning can increase learner engagement and promote deeper learning (Freeman et al., 2014).
- **Emphasis on reasoning:** The classroom is focused on developing reasoning skills, including analysing, synthesising, and evaluating information (Marshall, 2016). Learners learn to evaluate evidence and arguments and to make informed judgments.
- **Open-ended questions:** Adult trainers use open-ended questions to promote critical thinking. These questions require learners to think beyond a simple yes or no answer and to provide thoughtful, well-reasoned responses, promoting fluency as well as creativity. Critical thinking classrooms prioritise asking questions as a means of engaging with and understanding complex ideas. According to Brookfield (2012), "questioning is at the heart of critical thinking," and critical thinking classrooms encourage students to ask open-ended questions that lead to deeper exploration and analysis.
- **Collaboration:** The classroom emphasises collaboration among learners. Learners work in groups to solve problems and share ideas. This helps to promote a diversity of perspectives and encourages learners to learn from each other.
- **Assessment of reasoning skills:** In a critical thinking classroom, adult trainers assess learners' reasoning skills as well as their knowledge of content. This may include assignments that require learners to analyse arguments or evaluate evidence.
- **Real-world relevance:** Critical thinking classrooms use real-world examples to help students apply critical thinking skills to relevant and meaningful contexts. According to Halpern (2014), "real-world examples provide students with an opportunity to apply critical thinking skills to authentic problems and issues." Learners learn to apply their knowledge to solve real problems and make informed decisions.

- **Creativity:** Learners are encouraged to think creatively, using their imaginations to generate innovative solutions to problems.
- **Problem-solving:** Learners are taught how to identify problems, analyse them, and come up with effective solutions. A critical thinking classroom encourages students to consider multiple perspectives when analysing information and solving problems (Paul & Elder, 2013). This is achieved through the use of diverse readings, discussions, and assignments that expose students to different viewpoints.
- **Fosters a safe and supportive learning environment:** A critical thinking classroom is characterised by a safe and supportive learning environment where students feel comfortable expressing their opinions and ideas (Pascarella & Terenzini, 2018). This is important because critical thinking involves questioning assumptions and challenging the status quo.

In general, a critical thinking classroom is one in which learners are challenged to think deeply and critically about the material they are studying and to apply their reasoning skills to real-world problems.

2.2.5. Assessment

Assessment in a critical thinking classroom, although it's a challenge, is crucial for evaluating student learning and understanding of critical thinking concepts. Educators can assess the development of critical thinking skills in a classroom through the following ways:

- **Asking open-ended questions:** Rather than asking learners to simply recall information, adult trainers can ask them questions that require them to analyse and evaluate the information they've learned. Adult trainers should encourage learners to explain their reasoning and provide evidence to support their answers. Asking for information learnt verbatim is not part of a critically thinking classroom.
- **Assigning projects and presentations:** Projects and presentations require learners to apply critical thinking skills to complete the assignment successfully. Adult trainers should make sure the assignment has clear criteria and expectations. This will also check learners' creativity and fluency.
- **Conducting debates and discussions:** Debates and discussions provide opportunities for learners to practise critical thinking skills by presenting arguments and counterarguments, evaluating evidence, and considering different perspectives. They also allow instructors to observe students' ability to analyse and evaluate information in real-time (Paul & Elder, 2006).
- **Peer assessment:** it can be a valuable tool in the critical thinking classroom, as it allows learners to evaluate their peers' work and receive feedback on their own performance (Brookhart & Moss, 2016). This can help to build a collaborative learning environment and provide learners with multiple perspectives on the critical thinking process.

Overall, it's important to remember that assessing critical thinking is not a one-time event, but an ongoing process. Adult trainers should strive to create a classroom culture that encourages critical thinking and provides regular opportunities for learners to practise and develop these skills.

2.3. Good practices/applications in adult education

As has been established, critical thinking in education is a necessary skill to acquire because it leads to improved employment opportunities. This becomes even more crucial in adult education, where learners have limited time to practise these skills. The **Socratic Questioning method** is an effective application and practice of critical thinking in adult education. It is inspired by the teaching style of Socrates, the ancient Greek philosopher. Educators facilitate learning by guiding learners through a series of queries that challenge assumptions, provoke in-depth analysis, and promote meaningful dialogue.

The Socratic Questioning method aims to promote critical thinking skills by encouraging learners to examine their own beliefs, explore different perspectives, and develop logical reasoning. It promotes active participation, reflection, and the development of critical skills. It can be employed in practice by following these steps:

- **Establish a safe learning environment:** Create a supportive and respectful classroom environment where learners feel at ease expressing their ideas. Encourage open dialogue and assure learners that all concerns and contributions are valued.
- **Pose thought-provoking questions:** Ask open-ended questions that challenge assumptions, encourage analysis, and promote critical thinking. These questions should require more than simple factual answers and instead prompt learners to provide evidence, consider alternative viewpoints, and explore concepts.
- **Allow for thinking time:** Provide sufficient time for learners to process and reflect on the questions posed. Permit moments of silence to encourage deep thinking and to provide learners with an opportunity to formulate thoughtful responses.
- **Promote discussion and dialogue:** Guide learners through interactive discussions that allow for the exchange of ideas, thoughtful responses to diverse viewpoints, and the construction of evidence-based arguments. Offer support for learners to participate in respectful debate, encouraging them to question each other's reasoning and build upon shared insights. Consider providing guidelines for effective facilitation, such as establishing ground rules for respectful communication and employing techniques like paraphrasing to ensure mutual understanding.
- **Probe for clarity and evidence:** Through follow-up questions, probe learners for further clarification, evidence, and logical reasoning to support their arguments. This helps learners develop their ability to articulate their thoughts effectively, evaluate information critically, and refine their reasoning skills.

- **Provide feedback and guided reflection:** Offer constructive feedback on learners' responses, highlighting strengths and areas for improvement. Encourage learners to reflect on their thinking processes, evaluate the effectiveness of their arguments, and consider alternative viewpoints.

- **Connect to real-world applications:** Relate the Socratic questioning to real-world scenarios and applications. Help learners see the practical relevance of critical thinking by exploring how it can be applied in their personal lives, academic pursuits, and future careers.

By implementing the Socratic Questioning method as a teaching practice, educators can foster a classroom culture that values critical thinking.

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- Critical Thinking Across the European Higher Education Curricula (CRITHINKEDU)
- Critical Thinking Definition, Instruction, and Assessment: A Rigorous Approach.
- 6 important critical thinking skills you should master
- Why Is Critical Thinking Important?
- Why Critical Thinking Is Important (& How to Improve It)

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