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Critical Thinking as a Key Element in Health Education Programmes

Abstract: The primary aim of this paper is to demonstrate how critical thinking can be fostered within the context of the public programme “Understanding Health—the Pathway to a Healthy Lifestyle”. This programme was launched in 2024 as a response to pressing public health challenges in Slovenia. In the country, behavioural risk factors, such as obesity, stress, and a lack of physical activity, contribute significantly to the prevalence of health problems. Taking personal responsibility for health necessitates awareness, informed decision-making, and a critical approach to one’s own health and health-related content presented in the media.

For this purpose, the section of this article provides a brief introduction to the programme, detailing its modular structure, content, and objectives. It also justifies the development of critical thinking as an essential goal of the programme and of adult education more broadly. The relationship between lifelong learning’s role in cultivating critical thinking and the role of public programmes in fostering this skill is emphasised. Moreover, diverse perspectives on critical thinking and their corresponding practices are discussed.

The second section of this paper outlines the principles, strategies, and techniques of formative assessment for critical thinking, illustrated with examples from a selected topic. It discusses the phases of the formative assessment cycle and the key considerations in each phase: (self-) assessment of prior knowledge or skill level, articulation of learning objectives and success criteria, activities to achieve the objectives, feedback, and potential redefinition of learning objectives.

Keywords: adult learning, critical thinking, health literacy, formative assessment.

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Theoretical Framework

Education and knowledge have a significant impact on population health (Raghupati 2020; Shankar et al. 2013; Altindag et al. 2011). Research has demonstrated that education is an important determinant of health, as individuals with higher levels of education are more receptive to health information, leading to more informed health beliefs and appropriate health choices. Furthermore, this relationship is reciprocal: healthier individuals learn more effectively, and specific skills enable them to engage in activities that promote improved health, longevity, and reduced exposure to environmental hazards.

The impact of education on health can be either direct or indirect. Indirectly, it is manifested through access to quality employment, improved economic circumstances, strengthened social capital, and the promotion of healthy lifestyles. Individuals with higher levels of education are less likely to experience unemployment. They earn higher incomes, and work in less hazardous occupations. According to Elo and Preston, they are also less likely to smoke and more likely to exercise regularly, consume alcohol in moderation, and utilise preventive medical care (in Deaton 2003).

A direct impact occurs when specific skills are incorporated into the standard school curriculum or developed through extended schooling. Elo and Preston (Deaton 2003) assets that each additional year of schooling reduces the mortality rate by 8% in developed countries. Freudenberg (2007) emphasises that strategies designed to prevent school dropout yield significant health benefits.

Analysing data for the United States, Cutler and Lleras-Muney (2006) found that individuals with higher levels of education are less likely to die within the next five years, exhibit lower mortality rates from acute and chronic diseases, take sick leave, and experience fewer disabilities compared to those with lower levels of education. The concluded that higher levels of education correlate with improved health outcomes. This is attributed to schooling equipping individuals with general competencies, particularly cognitive skills required for the workplace. In addition, during the educational process, individuals acquire values, behaviours, and dispositions that positively impact their health.

The relationship between education, schooling, and health is complex, involving several interconnected factors. Dahlgren and Whitehead (1991)

developed the so-called 'Health Onion' model, which demonstrates the wide range of influences on health. This model proposes that these factors exist at distinct levels, or 'layers of the onion'. Age, gender, and hereditary factors form the model's core, followed by individual lifestyle and attitudinal factors. Beyond these are living and working conditions, as well as general socio-economic, cultural, and environmental factors. Education is a significant factor within this model, playing a crucial role.

The complexity of the 'education-health' relationship has also been examined by Solar and Irwin (2010), who emphasise the importance of social, economic, and political mechanisms in influencing an individual's social position. Social position is a multidimensional category defined by income, education, occupation, age, ethnicity, and other factors. Socio-economic positions are shaped by specific 'intermediary' determinants of health, which include: 1. material circumstances, such as housing quality, consumption potential, and the physical work environment; 2. psychosocial circumstances, including psychosocial stressors, stressful life events, and attitudes; 3. behavioural and biological factors, encompassing diet, physical activity, habits such as smoking and alcohol consumption, and genetic factors.

However, Evans and Stoddart (1990) emphasise that health is not evenly distributed across society. Certain vulnerable groups experience significant disadvantages, and they highlight four in particular: young people with low levels of education, women—especially those residing in less developed areas—individuals with disabilities, and migrants.

Sociological and public health literature emphasises that risky behaviour among young people directly contributes to poor health and is associated with factors such as low income, limited education, powerlessness, discrimination, and social exclusion. Sallona et al. (2008) found that adolescence is characterised by a strong tendency to engage in risky behaviour, a tendency that is significantly more pronounced during this stage of life than in later years. For instance, in 1999, the mortality rate among high school dropouts aged between 25 and 64 was twice that of individuals who had completed university.

A notable correlation exists between education and women's health. In most industrialised countries, women live, on average, six years longer than men. However, in underdeveloped countries in Asia, North Africa (e.g. Egypt),

Bangladesh, China, West Asia, India, and Pakistan, men tend to outlive women (Sen 1999). In these countries, women are often undereducated and subjected to victimisation; they encounter barriers to education and literacy, with over half remaining illiterate. Kickbusch (2001) emphasises that education and literacy are crucial indicators of health in less developed countries.

Camargosa, Machado, and Rodrigues (2007) observe that individuals with lower levels of education experience more deficits than those with higher levels. Bebbington (cited in Valkonen et al. 1997) asserts that individuals in higher occupational classes have longer life expectancies and live more years without deficits compared to those in lower occupational classes. Mirowsky and Ross (2000) found that people with disabilities constitute the most vulnerable group, as deficits and discrimination significantly hinder their ability to secure employment, resulting in a marked deterioration in their health. Deficits and poverty are mutually reinforcing, exacerbating the vulnerability and social exclusion of impoverished individuals with deficits. These challenges make it more difficult for children with deficits to attend school, for adults to join the workforce, to start a family, and to participate equitably in society.

Carabello et al. (2020) observed that the life expectancy of migrants in European countries is slightly lower than that of the general population. Migrant children in Europe are considered among the most vulnerable and discriminated against. They frequently encounter both direct and indirect discrimination, particularly in access to education.

The Slovenian Survey on Participation in Adult Education (Mirčeva ed. 2023) also explores the relationship between health and participation in lifelong learning. In this context, Rupnik Vec (ibid.) identifies statistically and practically significant differences in self-assessed health status across educational groups. Self-rated health consistently improves with higher levels of education, and the disparities between the three education groups are categorised as medium-sized. This study reinforces the conclusion that education is one of the most critical determinants of health, as demonstrated by numerous international studies (Solan and Irwin 2010; Bonnefoy et al. 2007; Raghupathi and Raghupathi 2020). The literature cited above emphasises that health promotion through education is vital, as it contributes to a broader range of opportunities for success and facilitates social inclusion. They stress that such promotion should not

focus solely on achieving a higher level of education but should also occur at the informal level, within local communities, migrant communities, and NGOs.

Research into critical thinking and its relationship to various personal characteristics is gaining momentum, with students being the most frequently studied group, as many researchers focus on optimising critical thinking stimuli within educational contexts (Solon 2008; Barak et al. 2007; van Gelder 2000). Murano (2023) discusses the synergy between critical thinking and lifelong learning. Lifelong learners naturally develop critical thinking skills by questioning assumptions, evaluating information, and engaging in reflective thinking. Similarly, critical thinkers are more likely to become lifelong learners as they recognise the limitations of their knowledge and actively seek new insights and perspectives. Lifelong learning enhances cognitive flexibility, resilience, and adaptability, leading to improved career opportunities and personal fulfilment. Together, these skills form a powerful combination that fosters intellectual growth and empowers individuals to thrive in an ever-changing world.

The following text presents a model for fostering the development of critical thinking through the principles of formative assessment in the publicly funded programme “Understanding Health—the Pathway to a Healthy Lifestyle” (Štemberger Kolnik et al. 2023). This programme is based on the findings of the European Commission’s evaluation report on the State of Health in the European Union: Slovenia—Country Health Profile 2019 (OECD & European Commission, 2019), which highlights that over a third (37%) of all deaths in Slovenia are attributed to behavioural risk factors (the EU average is 39%). Specifically, approximately 19% of all deaths are related to nutritional risks, 16% to tobacco use (primarily among young people and those with lower levels of education; the EU average is 17%), 3% to excessive alcohol consumption (the EU average is 3%), and 3% to low levels of physical activity (the EU average is 3%).

The programme “Understanding Health—the Pathway to a Healthy Lifestyle” incorporates content and objectives designed to enhance public awareness of health, healthy lifestyles, and personal development. The programme’s principal objective is to enhance the health and socio-emotional literacy of its participants.

Public Programme “Understanding Health—the Pathway to a Healthy Lifestyle” (UH)

As previously stated, the programme “Understanding Health—the Pathway to a Healthy Life” (UH) addresses health issues within the Slovenian region. It fills a gap in the array of public initiatives designed to improve citizens’ general competencies. The UH programme’s principal goal is to enhance adults’ health and social-emotional literacy, thereby improving the health of the adult population in Slovenia. It is fundamentally formative, as participants become more aware of their health-related beliefs, evaluate the validity of these ideas, and reflect on their own feelings and actions regarding a healthy lifestyle. The programme’s overarching aim is to assist participants modifying their core irrational health beliefs and habits, enabling them to make informed decisions that lead to more constructive and rational health-related behaviour.

The programme comprises four modules: Nutrition, Health and Prevention, Movement for Health, and Personal Development. In the Nutrition module, participants develop awareness of their eating habits, broaden and deepen their understanding of the basic principles of healthy eating, explore and critique various alternative approaches, plan personalised menus, and modify their eating habits if a discrepancy exists between their current habits and dietary guidelines. In the Health and Prevention module, participants learn about the principles of daily health maintenance and the prevention of chronic non-communicable diseases. They enhance their awareness of their actions in this area and are encouraged to modify their habits. An essential aspect of this module also involves learning about and navigating the healthcare system, as well as utilising digital technologies to access health services.

In the Movement for Health module, learners reflect on their exercise habits and evaluate their physical activity levels. They familiarise themselves with various exercises and plan to integrate them into their daily routine. The Nutrition, Prevention, and Movement for Health modules promote the development of health literacy in adults. Conversely, the Personality Development module aims to enhance participants’ socio-emotional competencies, or life skills, with a focus on mental health or psychological well-being. In this module, learners develop awareness of their thinking patterns, emotions, and actions in different contexts, assess their efficacy, and explore options for modifying behaviours.

The programme's goals include, but are not limited to, increasing participants' general knowledge and awareness of the factors that influence both physical and mental health, as well as disease prevention strategies, inspiring them to seek out and continually learn new health-related information, empowering them to make critical judgments and decisions, and encouraging them sustain responsible choices beyond the programme's completion, such as modifying their exercise, dietary, and emotional and interpersonal management practices.

The programme's principal objective is to broaden and deepen participants' knowledge of physical and mental health. This knowledge will be founded on a critical evaluation of health information, empowering participants to make informed decisions and act responsibly in this aspect of their lives.

Formative Assessment—Basic Didactic Methodology in Programme Implementation

A fundamental guideline for practitioners is to implement the programme according to the principles of formative assessment, which optimises learning towards learners' conceptual understanding and behavioural change. While the theory of formative assessment is still undergoing verification, it provides a solid foundation for diverse practices and the evaluation of their effects. Although initially developed within the context of child and youth education (Black and William 2009), its core principles are transferable to adult learning contexts. The theory is rooted in the foundations of humanistic psychology and the core principles of adult learning.

Humanistic psychologists define learning broadly as the comprehensive development of the individual or competence building. According to Rogers (1969), the premises of humanistic psychology include: 1. personal involvement (the whole person, with their cognitive and conative processes, engages in the learning situation); 2. self-initiation (the sense of discovery and comprehension originates from within); 3. pervasiveness (learning results in changes in behaviour and attitudes); 4. learner evaluation (the locus of evaluation resides with the learner, as they know whether the learning aligns with their needs); 5. the essence of learning is meaning creation (the learner is the creator of their own meaning).

These principles align with Lindeman's fundamental adult-learning postulates: 1. adults are motivated to learn as they experience needs and interests that learning will satisfy; 2. adults' orientation to learning is life-centred; 3. experience is the most valuable source of adult learning; 4. adults possess a deep need for self-direction; 5. individual differences among people increase with age (Knowles et al. 2005: 40).

Formative assessment encompasses five key strategies (Black in William 2009): 1. clarifying and sharing learning objectives and success criteria; 2. facilitating effective class discussions and other learning activities that provide evidence of learner understanding; 3. providing feedback that enables the learner to make progress; 4. encouraging learners to act as resources for each other; 5. encouraging learners to take responsibility for their own learning. Practice within a learning context is formative when records of learner achievement are collected, interpreted, and used by teachers, learners, and peers to plan subsequent steps in the learning process.

The essence of formative assessment is the learner's active engagement in all phases of learning, empowering them to manage the entire process. This approach aligns with both Rogers' and Lindeman's aforementioned learning postulates: personal involvement, self-initiative, pervasiveness, self-evaluation, meaning-making, experiencing the need to learn, orientation to life challenges, grounding in real-life situations and experiences, the need for self-directed learning, and acknowledging the increasing individual differences among adults, which necessitates individualised learning. An important element of formative assessment is the inclusion of various activities and intellectual challenges, through which learners receive quality feedback (from the teacher or peers) regarding their progress in both content and skills. Feedback facilitates continuous monitoring throughout the learning process and allows for adaptations to meet learners' individual needs. Based on this feedback, the facilitator plans further intellectual activities for learners, and learners focus on overcoming weaknesses or enhancing their achievements.

Other authors also emphasise these elements (e.g. James et al. 2006). The key concepts, therefore, are active learning, feedback, collaborative learning, and taking responsibility: "The essence of all these practices is to make learning explicit and enable or encourage the learner to take control of their learning" (James, *ibid.*). Keely (2011) highlights the diverse functions of assessing learners'

knowledge and skills, noting that assessment is formative when primarily aimed at promoting learning. It can occur formally or informally and is integrated into various phases of topic discussions. Diverse methods and techniques encourage learners to reflect on their own ideas, providing the teacher-moderator with information to plan further learning challenges in which learners can also participate.

Critical Consideration of Personal Health Beliefs and Media-mediated Health Content—Important Programme Goal

Critical thinking is not a singular concept in scientific and professional literature; rather, several theoretical perspectives exist that, while not mutually exclusive, overlap and complement one another in various respects. Within the context of adult education, the following perspectives are particularly relevant:

- (a) critical thinking as the ability to analyse, evaluate, and formulate arguments (Barry 1984; Bowel and Kemp 2002; Van den Bring Bugden 2001; Petress 2004; Wade 1995);
- (b) critical thinking as a set of cognitive skills and motivational attitudes (Ennis 1985; Lipman 1988; Facione et al. 1998; Halpern 1996; Paul 2003, 2006);
- (c) critical thinking as a self-reflexive practice (Brookfield 1995; Myers 2003);
- (d) critical thinking as a social-reflexive practice (Freire 2017, Burbles and Berk 2006).

Below is an outline of a strategy for fostering the development of critical thinking, primarily based on understanding critical thinking as the ability to analyse, evaluate, and formulate arguments. This strategy is applied within the context of engaging with health-related content. It assumes that learners acquire concepts such as argument, premise, conclusion, sound argument, and criteria for argument evaluation (reliability, relevance, sufficiency of premises). Equipped with this knowledge, learners evaluate both their own thinking (e.g. “Why do I believe this health belief is true? What evidence supports it?”) and the conclusions of others (e.g. “What reasons/premises does the author provide in support of these health claims? How strong are these reasons?”). Through engagement with

the various topics in the UH programme, learners become aware of their own health beliefs and evaluate their validity from an evidence-based perspective. At the same time, the learners are encouraged to investigate media-mediated health claims: they examine the reasons (evidence) supporting or refuting these beliefs and evaluate their quality.

Formative Assessment of Critical Thinking in the Public Programme “Understanding Health—the Pathway to a Healthy Lifestyle” (UH)

The Understanding Health programme consists of 100 teaching hours. At the beginning of each module (Nutrition, Prevention, Movement, Personal Development), the educator should engage learners in an activity (either group or individual) that encourages them to reflect on their beliefs about the chosen topic or to investigate socially established, media-mediated health beliefs. During this process, participants articulate both rational, science-based beliefs and health myths, which serve as a starting point for further inquiry—specifically, the search for evidence that supports or challenges individual beliefs and their overall evaluation. Participants ultimately formulate a final position: accept a medical claim as valid or reject it.

Formative assessment in this context does not primarily focus on assessment in the traditional sense (where educators evaluate a learner’s knowledge or a particular skill). Instead, it is primarily used as a philosophy or a set of principles to fully engage adult learners in their learning and empower them to take control over the cognitive and behavioural changes involved in the process (as shown in the table below). The essence of this process is the learner’s self-assessment and self-reflective thinking throughout the entire learning process. In the first phase, learners become aware of their existing knowledge of the topic and relevant skills (in this example, critical thinking, specifically argumentation). In the second phase, they set their (individual or group) learning goals and establish the success criteria. In the third phase, they plan a strategy to achieve these goals. Then, in the fourth phase, they actively deepen their knowledge and consciously practice learned skills through various methods, gathering evidence of their progress throughout the process. In the final phase, learners receive feedback (from the educator or peers) on their performance or product. This feedback serves as the starting point for self-evaluating their learning against the success criteria. If necessary, they may initiate another learning cycle.

The facilitator guides learners through the entire formative assessment cycle using various techniques or key questions to steer thinking in each phase (Kompare and Rupnik Vec 2016, modified: adapted to facilitate the critical thinking aspect of learning).

Table 1: Formative assessment phases: directing questions, goals, and activities

Formative assessment phase	Directing questions	Goal	Activities
Prior knowledge and skill	What do I already know about this topic? What are my beliefs, and what evidence supports these beliefs? What is the quality of my evidence?	Awareness of beliefs related to the topic and evidence supporting those beliefs	Filling in questionnaires, mind mapping, completing unfinished sentences, creating PRO and AGAINST statements, and debating
Goals and success criteria	What are my goals? What are the success criteria?	Explicitly stated goal: "To research evidence for particular health-belief." Explicitly stated success criteria: reliable, relevant, and sufficient evidence for and against the belief	Writing goal and success criteria in (e)portfolio
Strategy	How will I reach the goal? Where will I find information about the validity of the belief/ justification of my claim? What are reliable resources?	Clearly stated strategy for finding evidence	Using various planning techniques or graphic organisers for planning
Evidence	What is evidence? What is the counterevidence to my position or belief? Which perspective prevails: is my belief appropriate, or is it justified to accept the opposite?	A collection of evidence for or against a belief and a final decision on its merits (written as an essay or presented in a debate)	Research and analysis of data sources; findings presented as essays, term papers, projects, or debates
Feedback according to success criteria	How do others (teachers and classmates) view my thinking? Have I gathered relevant evidence to support my beliefs?	Oral or written feedback from the teacher and/or classmates	Direct feedback, questions aimed at highlighting weak points in an argument and suggesting improvements
Self-evaluation	How effective was I? What was happening in the activity (context)? What was I trying to achieve? Where did I excel? What did I not do so well? What do I want to change in the future? What will I work on?	Metacognition: awareness and understanding of one's thoughts and emotional processes (in the context of health-related issues)	Writing self-reflection guided by open questions, completing unfinished self-reflective sentences, completing self-evaluative questionnaires, and self-evaluation according to success criteria

Activities that enable learners to develop awareness, adopt a critical perspective, or question their own beliefs (prompted by the question, “How do I know my belief is true?”), and examine the evidence for the validity of these beliefs (guided by questions such as “What evidence do I have for this? How real, reliable and relevant is this evidence?”), represent a key moment in the development of critical thinking (Rupnik Vec et al. 2024). When such activities are practised regularly throughout extended education, not only regarding one’s own health beliefs but also concerning content presented by various media, learners cultivate an attitude of questioning their assumptions—in Paul’s definition of critical thinking, an attitude of “analysing and evaluating one’s own and other people’s thinking to improve it” (Paul 2006). They learn to differentiate between knowledge and understanding rooted in the health sciences and populist claims often driven by economic interests, enabling them to make more informed decisions regarding their health and health-related lifestyle.

Conclusion

In a rapidly evolving world, critical thinking and lifelong learning have become more crucial than ever. These skills empower individuals to navigate complex challenges, adapt to changing environments, and make informed decisions. This article outlines an approach to fostering the development of critical thinking, based on the principles of formative assessment, within the context of enhancing health literacy and promoting healthy lifestyles among adults in Slovenia through the public health programme “Understanding Health—the Pathway to a Healthy Lifestyle”.

The programme comprises four modules: Nutrition, Health and Prevention, Exercise for Health, and Personal Development. Within these modules, providers can foster the development of critical thinking through the principles of formative assessment. This is not primarily intended to evaluate learners’ knowledge or skill in the traditional sense, but rather as a holistic approach to facilitating learners’ self-regulated learning. This approach is cyclical and encompasses several steps in which the learner takes control of their own learning: assessing prior knowledge, co-designing learning objectives and performance criteria, exploring their reasoning, obtaining feedback, and evaluating their progress. These principles are

applied to the process of learning to think critically, with the authors highlighting the key reflective questions at each step and proposing techniques to address response attrition.

The programme has not yet been fully implemented, but it has been trialled in segments (specifically the Personal Development module) and is receiving highly positive feedback. A training programme for practitioners of the Understanding Health programme is currently being developed. We consider the implementation of this programme essential for the high-quality delivery of the Understanding Health programme.

Teaching critical thinking through the principles of formative assessment serves as a model for empowering adults, not only in developing thinking but also in fostering creativity and holistic personal growth.

Kritičko mišljenje kao ključni element u programima zdravstvenog obrazovanja

Sažetak: Primarna svrha ovog rada je da pokaže kako se kritičko mišljenje može promovirati u kontekstu javnog programa Razumijevanje zdravlja – put do zdravog načina života. Program je nastao 2024. godine kao odgovor na javnozdravstvene izazove u Sloveniji. U zemlji su faktori rizika ponašanja kao što su prekomjerna težina, stres i nedostatak vježbanja odgovorni za visok udio zdravstvenih problema. Lična odgovornost za zdravlje podrazumijeva svijest, informisanost i kritički odnos prema svom zdravlju i sadržajima koji se odnose na zdravlje kako se predstavljaju u medijima.

U tu svrhu, u prvom dijelu članka ukratko se predstavlja program te se ističe njegova modularna struktura, sadržaj i ciljevi. Takođe se opravdava razvoj kritičkog mišljenja kao suštinskog cilja programa, kao i obrazovanja odraslih uopšte. Ističe se odnos između uloge cjeloživotnog učenja u razvoju kritičkog mišljenja i uloge javnih programa u njegovanju ove vještine. Opisuju se različite perspektive kritičkog mišljenja.

U drugom dijelu rada predstavljeni su principi, strategije i tehnike formativnog ocjenjivanja kritičkog mišljenja, potkrijepljeni primjerima iz odabrane teme. Razmatraju se faze ciklusa formativnog ocjenjivanja i ključna pitanja u svakoj fazi: (samo)procjena prethodnog znanja ili nivoa vještina, artikulacija ciljeva učenja i kriterija uspjeha, aktivnosti za postizanje ciljeva, povratne informacije i potencijalno redefinisane ciljeva učenja.

Ključne riječi: učenje odraslih, kritičko mišljenje, zdravstvena pismenost, formativno ocjenjivanje, praćenje

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