




Futuristic perception on critical thinking in the new era

Percepción futurista sobre pensamiento crítico en la nueva era

Percepção futurista do pensamento crítico na nova era


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DOI (Generic) : <https://doi.org/10.35622/j.rie.2022.02.003>
DOI (Document in English) : <https://doi.org/10.35622/j.rie.2022.02.003.en>
DOI (Documento en español) : <https://doi.org/10.35622/j.rie.2022.02.003.es>

Received: 24/09/2021 Accepted: 31/12/2021 Published: 31/12/2021

KEYWORDS

teachers, strategies.
critical thinking, ICT.

ABSTRACT. Children from an early age must acquire superior abilities, which serve as the basis for their life. This study seeks to understand the perception of the most notable aspects of critical thinking in the current era, with a look towards the future. An exhaustive review, observation, selection, and collection of information of the most relevant scientific articles published in recent years were carried out through documentary analysis. In addition, the search for reliable databases, both national and foreign, was used. Critical thinking was found to have a path of historical notableness in humanity. In addition, the current situation of the pandemic makes it possible to show the need to leave futuristic life lessons so as not to be overwhelmed or relegated to the past. It is the ability to reinvent yourself an option to provide solutions to possible adverse situations.

PALABRAS CLAVE

docentes, estrategias.
pensamiento crítico,
TICs.

RESUMEN. Los niños desde temprana edad deben adquirir capacidades superiores, que sirvan como base para su vida. Este estudio busca comprender la percepción de los aspectos más notables del pensamiento crítico en la época actual, con una mirada hacia el futuro. Mediante el análisis documental se realizó una exhaustiva revisión, observación, selección y recolección de información de los artículos científicos más relevantes publicados en los últimos años. Se recurrió a la búsqueda de bases de datos confiables, tanto nacionales como extranjeras. Se encontró que el pensamiento crítico tiene una ruta de notabilidad histórica en la humanidad. Además, la situación de la pandemia vivida en la actualidad permito evidenciar la necesidad de dejar lecciones de vida futurista, para no

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agobiarse, ni relegarse en el pasado. Siendo la capacidad de reinventarse una opción para dar soluciones a las posibles situaciones adversas que se presenten.

PALAVRAS-CHAVE

professores, estratégias, pensamento crítico, TICs.

RESUMO. As crianças desde cedo devem adquirir habilidades superiores, que servem de base para suas vidas. Este estudo busca compreender a percepção dos aspectos mais marcantes do pensamento crítico na era atual, com um olhar para o futuro. Por meio da análise documental, foi realizada uma exaustiva revisão, observação, seleção e coleta de informações dos artigos científicos mais relevantes publicados nos últimos anos. Utilizou-se a busca por bases de dados confiáveis, nacionais e estrangeiras. Descobriu-se que o pensamento crítico tem um caminho de notabilidade histórica na humanidade. Além disso, a situação atual da pandemia permite mostrar a necessidade de deixar lições de vida futurísticas, para não ser esmagada ou relegada ao passado. Sendo a capacidade de se reinventar uma opção para dar soluções às possíveis situações adversas que surjam.

1. INTRODUCTION

As we enter the third decade of the 21st century with a world scene shaken as a result of the COVID-19 pandemic and dominated by technology, there is concern about fostering the development of critical thinking to promote the improvement of skills in teachers.

Critical thinking, defined as an essential ability to analyze, argue and create solutions based on internal reflection, is considered one of the pillar competencies of education (UNESCO, 1997). Currently, it is highly valued and generates concern for many intellectuals, who propose various models, resources, and strategies.

In Indonesia Kardoyo et al. (2020) developed the improvement of critical and creative thinking skills in students relying on the problem-based learning strategy. They consider it essential to solve situations presented from the analysis, face the challenges of the Industrial Revolution 4.0, and face the digitization of industrial processes, through the interaction of artificial intelligence and machines.

A study carried out in Spain by Ortega and Gil (2020) shows that for the advancement of society it is almost essential to train students with critical thinking skills and thinking skills. It considers that students must identify, analyze, evaluate information and be autonomous. These skills are highly required both for their academic training and to obtain a job in the future, being necessary to satisfy them from an early age.

In Latin America, Aldana et al. (2020) envisioned transcendental changes in the student-oriented learning methodology. They consider fundamental the fusion that takes place between inquiry and learning to generate new knowledge, without neglecting what is proposed by UNESCO regarding learning for life.

Deroncele et al. (2020) consider critical thinking a fundamental competence for teaching-learning and essential for developing informed, reflective, decisive students and professionals. Able to make decisions based on knowledge, hand in hand with the virtual space without neglecting innovation and creativity.



In Lima, Peru, with the use of the Blackboard, it was possible to significantly develop the students' critical thinking, indispensable for solving problems. Valencia (2020) affirms that its use allowed increasing the dimensions of argument, observation, deduction, and approach, offering instant results due to the use of virtual media in learning activities.

The advancement of society today and in the future will depend on the academic training provided in schools. These are the ones that generate suitable students with capacities in critical and reflective thinking, who contribute to the improvement of their context, who have high aspirations, and who have a futuristic vision both in their student life and in their professional life (Giannini, 2020).

At present, there is great concern about directing and enhancing specific higher thinking skills in students that will be very useful in their learning. Critical thinking helps them solve problems or everyday situations. Let's take a look at a large amount of information currently found. It is necessary to conduct a detailed and critical observation to differentiate between relevant, essential, or factual information from superfluous or false information (Ramírez, 2019).

Faced with the review of critical thinking, various opinions are found, so questions arise: How do we perceive crucial thinking in education? Who or from what aspects or criteria does it contribute to the development of critical thinking? What contributions research in recent years present to guarantee the outcome of critical thinking in the 21st century in the educational field? What are teaching skills needed to develop critical thinking in students? Questions guiding the present study.

Critical thinking defined by various researchers receives a well-deserved connotation and importance within pedagogy. For example, Sternberg (1986, como se citó en Bezanilla et al., 2018) defines it as the processes, strategies, and representations used to solve problems, make decisions and learn new concepts. For his part, he also cites Ennis (2003, como se citó en Bezanilla et al., 2018) points out critical thinking as a reflective and reasonable thought that focuses on the being can decide what to believe, or what to do, becoming a prudent complex cognitive process, being a meditative thought, because it uses results, situations, of the subject itself or another.

Facione (como se citó en Cangalaya, 2020) defines critical thinking as controlled thinking that displays sense, observation, appreciation, and consequence skills. In the same line of analysis, Paul and Elder (2003, como se citó en Cangalaya, 2020), consider it the condition of thinking about any text, argument, or situation on which the initial thought disposition is perfected. It is specified as a cause of inquiry for understanding, which allows

for greater effectiveness and aptitude in the desired referrals through argumentation skills. Vendrell and Rodríguez (2020) include the resolution of situations and decisions.

Critical thinking in a usual way is inherent to the person, who conceives it according to the need and position in which they find themselves. This necessarily has to follow a process of analysis and evaluation of their ideas; that is, it leads to a review and reflection of what is done. You can then make effective decisions and solve daily life's various problems or situations.

In practice, the development of critical thinking skills in school is minimal. This generates neutral students with minor criteria, arguments, and solutions to problematic situations in their environment. Therefore, there is a need to lead the student to use reasoning and develop concepts based on their own experience (Maturana & Lombo, 2020).

Other works allow finding those who depend on the development of creative thinking; among them are those who state that the teacher is a fundamental piece. In this regard, Carvalho et al. (2020) establish that the teacher is responsible for promoting, activating, and evaluating progress in the development of critical thinking by various means and circumstances. This plays an essential role for students to express their judgments, reasons, among other vital skills in their daily life.

The teacher's teaching-learning strategies, properly and perennially, allow university students to become qualified, reflective, critical professionals to perform competently. It is then necessary that dynamic plans be designed in enriched environments, with didactic sequences that tend to reinforce essential thinking (N. Castillo, 2020; R. Castillo, 2020; M. García et al., 2020).

Creative thinking is inherent in every human being involved in the educational process. Thinking leads to an intellectual activity that helps us analyze and redirect our efforts. Likewise, it allows a more adequate or elaborate response to be provided, which is why the various internal structures or capacities to perceive come into play. It is necessary to analyze and cross information to consider changes, needs, pre-existing knowledge, and what is new that is being presented. Some studies indicate that education must assume a significant commitment to have the necessary tools to transform society with its didactic and pedagogical work supported by critical thinking (R. Castillo, 2020).

Under the scenario experienced by the pandemic, the use of technology is essential for the development of critical thinking. According to Lengua et al. (2020) the use of information technologies as a mediation between the teaching-learning processes has led to the conception and design of new paradigms that help define new

didactic and pedagogical proposals. Therefore, it is sought to promote not only spaces but also methodologies that transcend the traditional ones.

To know the most relevant aspects of research on creative thinking, the contributions presented to guarantee the development of critical thinking in the educational field are analyzed.

2. METHOD

This article was prepared from the consultation in the different databases such as Scopus, EBSCO, ProQuest and Google Scholar, among others, published between the years 2018 to 2020.

The analytical-synthetic, inductive-deductive method was used. In addition, articles were consulted and their revision, the fundamental aspects of the research, the educational levels, and the various areas or subjects.

According to study variables

The information related to the study variables of the articles reviewed is presented in the following table.

Table 1

Study variables

Topic	Author	Country / Year	Variables
Impact of Critical Thinking on skills for the labor field.	Aguilar (2020)	et al. México 2020	- Critical thinking - Labor sphere - University teachers
Critical thinking: a central element in learning and argumentation in the students of the Universidad del Pacifico.	Arroyo (2020)	Colombia 2020	- Critical thinking - Deconstruction and cognitive construction - Research teaching
Intervention program, based on a critical debate on the critical thinking of university students	Tabares (2019)	et al. Colombia 2019	- Critical thinking - Intervention program - Critical debate. - University students - Psychologists
Philosophy for children: the program that awakens creativity and critical thinking	Bejarano and Mafla (2020)		- Philosophy program for children. - Critical and creative thinking in childhood

The Guanacaste Legend "La Mona": a didactic strategy for developing critical thinking and cultural competence from the university classroom.	Cubero y Villanueva (2020)	Costa Rica 2020	<ul style="list-style-type: none"> - Critical thinking - New ways of learning. - Pedagogical mediation - Investigation of all participants - Cultural identification
The Webquest as a didactic tool to promote critical thinking in the training of university students.	Delgado et al. (2020)	Ecuador 2020	<ul style="list-style-type: none"> - WebQuest as a teaching resource - Constructivist learning - Significant learning - Higher education - Teaching tools - Critical thinking
The use of information and communication technologies as a motivational strategy in the mixed classroom.	L. García et al. (2019)	México 2019	<ul style="list-style-type: none"> - Use of information technologies - The motivation. - Sense of competence of the students.
Use of information and communication technologies in journalistic writing and development of critical thinking.	L. García et al. (2019)	Colombia 2020	<ul style="list-style-type: none"> - Use of ICT in school journalism - Secondary students - Quantitative approach - Critical thinking
Digital Technologies in Service-Learning for Citizen Training of the New Millennium.	Sandia y Montilva (2020)	Venezuela 2020	<ul style="list-style-type: none"> - Training of citizens for the new millennium. - Critical thinking - Service-learning approach.
Critical thinking: an emergency in virtual learning environments	Taborda & López (2020)	2020	<ul style="list-style-type: none"> - Critical thinking - Virtual environments - Strategies - Research
Critical Thinking Skills Assessment: Culture-Free Instrument Validation.	Vásquez y Manassero (2020)	España 2020	<ul style="list-style-type: none"> - Critical thinking teaching programs - Teaching skills - Age of students - Critical thinking assessment tests.

Environmental education as a strategy to promote critical thinking.	Torres (2019) Colombia 2019	<ul style="list-style-type: none"> - Environmental situation - Primary students} - Student and teacher reflection - Critical thinking - Ethical values
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Source: self made

According to strategies and dimensions considered to assess critical thinking

The authors consider different strategies and dimensions considering the characteristics of the students, according to the level of studies in primary, secondary, or higher, as shown in the following table.

Table 2

Strategies and dimensions used by the authors

Characteristics	Dimensions	Strategies	Author / Country / Year
Higher	Interpretation Analysis Explanation Evaluation Synthesis	Cooperative learning (Heterogeneous work groups)	Silva et al. (2019)
Ability to logically order oneself prioritizing emergencies and discarding accessory elements to become a practical expression.	Analysis criteria Elucidation Deliberation Synthesis	Action plan: workshops for a group of university teachers Dialogue based on the needs presented in the school system participatory methodology	R. Castillo (2020) Chile
Primary	Knowledge Inference Evaluation Metacognition	Reading comprehension: literal, inferential, criterial reorganization,	Arévalo (2020)
Secondary	Analyze Reasoning Question Evaluate Position Act	Cooperative learning	Trujillo (2021)
Secondary	Noun dialogic	Roleplay Debate	Tabares et al. (2019)

Source: self made

According to observation unit and instruments

The present work was based on a thorough bibliographic review supported by hermeneutics. The analysis, interpretation, critical appreciation, and systematization of scientific articles found in different databases such as Scopus, Ebsco, Scielo, ProQuest, Google Scholar, Eric, Redalyc were carried out.

More than 40 updated articles were reviewed in Spanish, English, and Indonesian, with specific language limitations. The filter made in the search was by year of publication. Therefore, the selection was based on studies published between the years 2018 - 2020 to publicize the review results, sampling, analysis and meticulous fusion of research on the critical thinking variable.

The following table shows the most critical indicators considered as an author, object of study, comparison, and interpretation.

Table 3

Observation unit and instruments

Topic	Type of research	Units of observation	Methods and instruments
Professional competencies of primary education teachers.	Descriptive	Teachers Basic education students	Bibliographic review Poll
The development of critical thinking in university students through Problem Based Learning.	Transverse Quantitative	University students.	Observations over a period of time Quantitative evaluation Qualitative rubric

Evidence of the development of higher-order thinking in university professors, based on tests formulated according to the SOLO taxonomy.	Descriptive	University teachers Probabilistic sample defined by the researcher	Questionnaire ConQuest Software
Evaluation of an intervention program in critical thinking through controversy.	Investigation action	University teachers	Interview semi-structured
The development of critical thinking in the curricular proposal of art education in Chile.	Documentary research	Study programs of the subject of Visual Arts for the four levels of secondary education proposed by the Ministry of Education of Chile.	Comparison table.
Perception of critical thinking skills development at the National University of Asunción, Paraguay.	Quantitative	Students who they are in their last year in six careers at the Faculty of Philosophy.	Indicators guide (Table). Type test Likert.
Puno: Rural education and critical thinking. Towards an inclusive education.	Documentary research.	Normativity Reports	Bibliographic review
Systems based on critical thinking for social change from the university.	Documentary research.	Normativity	Revision bibliographic

Critical thinking from Documentary University Analytical table
 cognitive psychology: a research. students
 disarticulation of social
 criticism and its possible
 implications in university
 training in psychology.

Source: self made

3. RESULTS AND DISCUSSIONS

The bibliographic review has been essential for the development of this article. Table 4 shows the most outstanding results of the scientific works found and how they favor the critical appreciation of this research.

Table 4: *Bibliographic systematization*

Author	Topic	Topic
Mena (2020)	A taxonomy of educational media for the development of critical thinking: Domains of action and textual typologies	<ul style="list-style-type: none"> - The work shows that virtual education has a beneficial impact on the analysis of critical thinking in students. - Use in coordinated way resources or means that help to think.
	Graduate faculty and the development of critical thinking	<ul style="list-style-type: none"> - Permanent preparation of the teacher by the professional identity. - Research is an essential activity in permanent training and the development of critical thinking. - Encourage reflection and curiosity in students.
Vendrell and Rodríguez (2020)	Critical thinking: conceptualization and relevance within higher education.	<ul style="list-style-type: none"> - The nature of critical thinking is very similar to the scientific method. - Justice is considered a rule of the critical thinker; however, too much fairness can promote discrimination.



Becerra et al. (2020)	We promote life skills in students of a training institution for work and human development.	<ul style="list-style-type: none"> - The teacher's perception of the students is in good harmony and with possibilities for work. - Communication skills and interpersonal relationships are essential as skills to develop. - Collaboration, teamwork are skills that promote life skills.
Lévano (2020)	Critical thinking and acquisition of strategic competence in translation students	<ul style="list-style-type: none"> - Revealing the influence of the activities outlined for the progress of critical thinking in strategic competence was measurable through the ability to analyze problems and evaluate translations. - The training allowed those in the experimental group to propose creative and communicative equivalents for terms that appeared in the output text
Ballén (2020)	Critical thinking and constructivism: a process of teacher reflection	<ul style="list-style-type: none"> - The direct result refers to the process by which teachers reflect on their practice. These processes allow establishing the learning process from the experience that shares it and planning these elements in the teaching process. - In the oral and written presentations of the students, the understanding of the organizational objectives and the thinking about the role that education plays in society is reaffirmed.
Taborda and López (2020)	Critical thinking: an emergency in virtual learning environments	<ul style="list-style-type: none"> - The student must have technological resources, motivation, and disposition to develop critical thinking. <p>To develop critical thinking, it is necessary to update the methodology using dynamics that affect the student's active participation.</p>
Triviño and Vaquero (2020)	Artistic and civic education in the initial teacher training: a case study on the development of critical-	<ul style="list-style-type: none"> - Teachers in training are part of the millennial generation who, since their adolescence, have been using ICTs, the same ones who are consumers and practical in the management of technology and its use.



creative-social thinking through "Badly"	- It is as intangible to speculate and critically interpret the contents of audiovisual texts as to be creators of the same texts.
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Source: self made

As shown in the table above, the development of critical thinking depends on several factors, one of them being the teacher who must be in permanent training and updating to guide and accompany their students. Likewise, he must reflect on his practice and use the resources or means necessary to develop critical thinking in students.

For Tabares et al. (2019) , critical debate privileges the development of critical thinking and its abilities in university students, contributing to the solution of difficulties and to making better decisions. Similarly, Cubero and Villanueva (2020) highlight the teaching work as essential in terms of the attack, the agreements reached in the classroom, the lasting joy of wanting to learn, and the efforts to achieve curiosity analysis, reflection so that meaningful learning is achieved.

On the other hand, some consider the acceleration of technological advances, the creation of new and constant knowledge, easy access to information, easy interaction, and collaborative work through the Internet as factors that significantly favor learning. However, as Sandia and Montilva (2020) state, the teacher must handle technology, so it is necessary to keep constantly updated and rethink the training and development of skills and attitudes at all educational levels, adapting their social needs.

Research, communication skills, interpersonal relationships, collaborative work, and teamwork are fundamental skills to be developed. In addition, they are considered essential actions or processes in the formation and development of critical thinking because they allow increasing reflective skills that help make decisions and solve routine problems.

Arroyo (2020) analyzes and reflects the pedagogy in terms of critical thinking through deconstruction, which gives way to the cognitive construction, argumentation, and the use of critical thinking by students. It is necessary to consider the strategies, activities, and research that the teacher uses to encourage reflection, starting with an unlearning of the organizations and mental representations acquired at the beginning of their student training.

The research carried out by Torres (2019) identifies and analyzes its context's environmental and situational problems. Through reflection and inquiry, spaces of knowledge are generated to become aware, assess, prevent and contribute to the solution of such situations, linking it to the affective bond when conducting active research. Through direct observation and the acquisition of knowledge in situ, critical thinking is used. Like Torres, authors



such as Aguilar et al. (2020) propose the development of necessary thinking skills with essential components and evolve to the education of the future.

Fostering reflection and curiosity in students is one of the objective benefits of developing critical thinking. This has been treated and developed by the preceding scientific articles.

4. CONCLUSIONS

The analysis of the different scientific articles of each one of the consulted databases coincides in that the context of the XXI century, demands urgently, to participate and make the most of all the process of training and teaching updating to develop critical thinking, taking into account It takes into account the aspects or dimensions that must be developed permanently.

Using innovative strategies also contributes to the development of critical thinking in students. The situation will allow them to respond with relevance to all the demands presented today and transcend in the future, which will be even faster.

The articles analyzed to give us many lessons regarding the importance of the proper use of technology. However, as a result of the COVID 19 pandemic, which constitutes the support and salvation of the educational service for the aforementioned appropriate use, it is necessary to develop critical thinking in all the actors so that in a decided and reasoned way they choose its beneficial use, both particular, as well as of the common good in general.

Conflicto de intereses / Competing interests:

Los autores declaran que no incurre en conflictos de intereses.

Rol de los autores / Authors Roles:

Marcela Tapia: conceptualización, curación de datos, análisis formal, adquisición de fondos, investigación, metodología, administración del proyecto, recursos, software, supervisión, validación, visualización, escritura - preparación del borrador original, escritura - revisar & edición.

Edward Castañeda: conceptualización, análisis formal, investigación, metodología, administración del proyecto, recursos, software, supervisión, validación, visualización, escritura - preparación del borrador original, escritura - revisar & edición.

Fuentes de financiamiento / Funding:

Los autores declaran que no recibió un fondo específico para esta investigación.

Aspectos éticos / legales; Ethics / legals:

Los autores declaran no haber incurrido en aspectos antiéticos, ni haber omitido aspectos legales en la realización de la investigación.

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