

International Journal of Human Sciences Research

DEVELOPMENT OF CRITICAL THINKING IN THE UNIVERSITY CURRICULUM

Celia Carrera Hernández

Profesora de tiempo completo en la
UUPNECH Unidad Chihuahua, México
<http://orcid.org/0000-0002-2444-2204>

All content in this magazine is licensed under a Creative Commons Attribution License. Attribution-Non-Commercial-Non-Derivatives 4.0 International (CC BY-NC-ND 4.0).



Abstract: The third constitutional article in Mexico establishes the need to develop critical thinking in students; on the other hand, the new basic education curricular policy includes a training field on critical thinking. For this reason, the theoretical discussion on higher education postulates that university students must be critical, and to do so, from the formal curriculum and its development, critical thinking must be encouraged not only to fulfill the purposes of education at the level, but for the influence of its graduates in social transformation. Based on the review of the literature and a previous exploratory study in which teachers and students participated in the reflection on teaching in the Bachelor's Degree in Educational Intervention (LIE) of the National Pedagogical University of the State of Chihuahua (UPNECH) and the difficulties of the students in the process of implementation, development and evaluation of the intervention project, this research was carried out with a quantitative approach under a descriptive transectional design with the purpose of evaluating the critical thinking of the students and with it, making changes in teaching. A mixed questionnaire was designed with a reliability index of 80 and was applied to 55 fifth semester students. The skills that still need to be developed to intervene are inductive reasoning and argumentation, important for developing diagnoses and identifying areas of opportunity to transform them, so teachers must take them into account during their teaching.

Keywords: Critical thinking, curriculum, higher education, skills, students.

INTRODUCTION

Higher education in the world is undergoing transformations that have repercussions on the economic, social, political and cultural levels. For this reason, many countries are reforming their educational systems because they consider that what happens in the classrooms today will determine their future. (Tuirán, 2019:1). The debate on higher education is present throughout the world and among the issues addressed is the need to review and transform the educational system to face demands of a new nature arising from the globalized world. (ANUIES, s/f).

In recent years, higher education has been transformed, enrollment has grown, academic offerings have diversified, academics have become professional, modalities have expanded, but the purpose of the formal curriculum and its development remains to be discussed since it is not only about train professionals and technicians for the labor field who are competent in the area for which they were trained, but who develop skills to achieve the purposes of higher education such as the transformation, development and independence of Mexican society. The student must have comprehensive training and participate democratically as a citizen in public decisions, as well as in the production of scientific and technological advances. For students to achieve these objectives that the National Association of Universities and Higher Education Institutions (ANUIES) proposes, it is important that they develop critical cognitive skills, which have not been considered in the evaluation of graduates of higher education programs.

Training critical, reflective and fearless professionals are the challenges of current higher education according to Ríos (2016), who mentions that the state of violence, economic precariousness and social imbalance that

characterizes several countries in the world can be faced with training without fear of propose and participate in solving problems. Fear generates social paralysis, which is why we experience an imperfect democracy in current societies in which poverty, inequality and economic uncertainty prevail, which makes it difficult to prepare adequate public proposals.

Furthermore, globalization has permeated political power and control in nations and it is control that inhibits freedom. A situation that has reached education with bureaucratic mechanisms that limit the participation of students in important proposals for development. The challenge of education in Mexico, not only in higher education but in those that precede it, is to form critical students capable of innovating, therefore, humanistic criteria such as reflection, decision making and problem solving with arguments must be introduced. solids.

To achieve the above, higher education has a strong commitment to the exercise of teaching oriented to the development of critical thinking and its evaluation. It is the higher education institutions that must monitor compliance with the curricular objectives established in the graduation profiles, as well as those proposed by ANUIES. In this research, we refer to the institutions that train professionals in the field of education, such as the UPNECH, which offers the Bachelor's program in Educational Intervention, which has the purpose of training a professional capable of working in various fields. fields of the educational field through the acquisition of skills that allow them to solve socio-educational and psycho-pedagogical problems.

Ensuring that a student can solve socio-educational and psycho-pedagogical problems in the areas of formal, informal and non-formal education is a challenge for UPNECH

since to do so it is necessary to focus on the development of critical thinking based on analysis, reflection and evaluation of social situations that change and are circumstantial.

It is considered that critical thinking is relevant for autonomous learning in the training of university students, specifically, those who are trained to work in the field of education, but there is a lack of systematic work on how to promote its development and evaluation. The review of the literature reflects few studies on the topic in this field, hence its relevance. Regarding evaluation, Ossa-Cornejo and others (2017) conducted a review of 31 database studies of instruments used to evaluate critical thinking and found divergences in defining and evaluating critical thinking with a wide variety of instruments, as well as of the identified skills. Critical thinking has been studied since the 70's, when it was detected that rote learning is not enough to train citizens and professionals capable of responding to the demands of the context. Intelligence is no longer seen only as an intellectual aptitude to process information and master specific topics, but rather as the possibility of involving the development of skills that allow the subject to have more productive, creative thoughts, with a reasoned basis for making decisions that provide the best solution to your problems.

This thought has been named by several authors as critical thinking and an attempt has been made to develop it from the official curriculum at different educational levels and under different theoretical and methodological approaches. However, it is difficult to ensure that the training of students with critical thinking in schools has been a success. Even conceptualizing it and establishing the processes for its development is complex since there are a variety of proposals.

Critical thinking is a construct about a type of complex cognitive process that is made up

of several interrelated processes or skills that allow us to evaluate, process analytically and reflectively, judge, accept or reject information produced in social contexts or in scientific work (Tung and Chang, 2009). Thought that future graduates in educational intervention need to develop who, due to their broad field of action such as formal, informal and non-formal education, with educational processes derived from diagnoses of the reality with which they are going to intervene and with theoretically and theoretically argued actions. empirically to perform with socially vulnerable groups.

The work environment of the Educational Intervenor is complex, diverse, with a high degree of difficulty and requires the follow-up of a reflective process, evaluation and careful analysis to develop an intervention process that ranges from diagnosis, action plan, implementation and evaluation that materializes in an educational development project. For this reason, it was considered pertinent to evaluate critical thinking in the students of the eighth semester of the LIE at `` Universidad Pedagógica Nacional del estado de Chihuahua `` (UPNECH). It is also relevant since today's society requires participatory citizens instead of passive ones because only This will achieve social well-being, community life and the constant improvement of social groups in different aspects of their lives.

The review of the literature and a previous exploratory study with teachers and students through focus groups and interviews were triggers for the need to evaluate it in order to make changes in teaching. The teachers identified serious difficulties in the students in understanding the problems that arise in the context where they will intervene, using theoretical and empirical arguments; communicate their ideas or knowledge, orally and in writing, understand written texts, create and innovate in the design of strategies to

intervene, systematize the experience through the analysis of the interventions carried out and deduce important achievements and results.

It was highlighted that students present difficulties in the development of the educational development project in its different stages, which is why they mention that students need to develop skills such as analysis, reflection, evaluation of texts, communication skills in which they express their conclusions and findings. in an argued manner regarding the problems they identify, the solution to them and the results of the intervention, also skills to search for information either from different research instruments or from reliable theoretical sources. The skills that teachers mention are those related to critical thinking according to Facione (2007).

Based on the critical nodes mentioned above, the following research question is posed

What critical thinking skills have the students of the UPNECH Bachelor's Degree in Educational Intervention who are in the eighth semester developed in relation to the development of educational development projects?

The general objective is to evaluate the critical thinking skills that students studying the eighth semester of the UPNECH Degree in Educational Intervention have developed so that teachers can analyze the results and make improvements in teaching.

The ability to reason was considered because according to Ossa-Cornejo, et al (2017) it is the first element that characterizes critical thinking since it is linked to reflection and is a high-order process used to review, process, question and evaluate. a fact in a profound way to avoid naivety in decision making. The educational interventionist requires investigating diverse contexts, identifying

needs and arguing their position with evidence, a situation that avoids the invention of realities and problems, as well as solutions or the memorization of theoretical concepts and strategies previously used by themselves or by others, to which a forced application is sought in an intervention project.

Decision making is an important element in the development of critical thinking since it involves cognitive processes related to the analysis of information, identification of reasons and evaluation of arguments, processes necessary to analyze data and make decisions based on the information collected (Halpern, 1998 and Yang, 2012). For the educational interventionist, the use of this skill is crucial since they must make decisions personally or collectively when evaluating the intervention process and the results to reorient the action if the problem has not been solved or the actions were not sufficient and relevant to the problem. The reorientation of the action or the decision to terminate it depends on the in-depth analysis of the information recovered in the process of implementing the intervention design.

The skill of decision-making is closely related to problem solving since it is what guides the process of analysis and review of information during the educational intervention and leads the student to seek the best decisions.

Argumentation is a skill considered transversal in this study since both inquiry and reasoning, decision making and problem solving require elements that support and guide the use of the skill in specific situations. The use of theoretical and empirical evidence is the subject of analysis, the process followed in each of them implies the use of sufficient information for good judgment of both the reality in which one intervenes, the proposed actions and performance as a professional.

Derived from the above, critical thinking

is a high-level cognitive skill necessary in any person, especially in education professionals, that allows the analysis of information emanating from the environment, from various sources, identifying its validity, purposes or intentions, question your origin, reflect on your own thought processes and make the right decisions with sufficient arguments.

Therefore, the development of critical thinking skills must be made explicit in the design of undergraduate and graduate programs according to the training and work demands of professionals. According to the tradition in the evaluation of critical thinking, different instruments have been built, the first were quantitative and later they were designed with a qualitative tendency, the above, due to the number of participants. For Marzano and Coste (1988) it is ideal to work with small groups from which to identify and analyze behaviors qualitatively with open response instruments. Closed-response instruments have received many criticisms due to the difficulty in identifying the mechanisms or skills involved in the task of thinking critically, such as decision making, problem solving, and argumentation. For this reason, instruments have been designed in the form of an essay and open response, convinced that construct validity and reliability is limited.

In addition, hybrid instruments have been designed, such as the case of Halpern (2012) who carried out a questionnaire with 25 problem situations from which he derived a closed-response question and an open-ended one. La Fuente (2009) in Paraguay designed a questionnaire made up of two parts, one with a closed response and the other open, in the latter presenting a series of scenes for people to explain the situation with arguments. Therefore, it was considered to design a hybrid instrument with open and closed questions derived from three situations

to promote reasoning in the student about the educational intervention process.

THE METHOD

The research approach used is non-experimental quantitative with a descriptive transectional design. 55 students from the eighth semester of the LIE at the UPNECH Campus Chihuahua participated, 50 women and 5 men, between 22 and 25 years of age. Purposeful non-probabilistic sampling was used.

The survey technique was used with the use of a mixed questionnaire consisting of three cases from which 10 closed-response questions with multiple choice and 9 open-response questions were derived. For the design, Marzano and Costa (1988), Halpern (2006) and Saiz and Rivas (2008) were considered. Content validity was carried out with 5 judges in a single round, modifications were made to the wording of the cases and to three questions. The reliability index is 80. SPSS software was used for data analysis. The skills that were considered in the evaluation of critical thinking due to their relationship with the development of educational development projects are the following:

Skills	Stages of the educational development project	Items
Investigation or inquiry	Diagnostic stage	1, 2, 4,
Inductive reasoning	Diagnostic stage	5, 6,
Deductive reasoning	Diagnostic stage	3, 4, 7, 8, 9.
Troubleshooting	Intervention design and implementation.	10, 11,
Decision making	Monitoring of the intervention and results.	16, 17,
Assessment	Intervention evaluation. Project evaluation. Impact assessment	12, 13, 14, 15, 18, 19.
Argumentation	All stages of the intervention.	2, 4, 6, 8, 11, 13, 15, 17, 19.

Table 1: Aspects to evaluate critical thinking skills

Source: self made.

RESULTS

The results of the evaluation of critical thinking skills are:

THE INVESTIGATION INTO THE DIAGNOSIS

The skill of inquiry consists of searching the context through different techniques and instruments for information necessary to understand it, identify problems, deepen its analysis and communicate the results, which is why it is related to the diagnostic stage in educational intervention. A total of 74.5% of the students demonstrated a high level of development of the inquiry skill, necessary in the diagnosis stage for educational intervention.

5.5% reflect a medium level in terms of the development of the skill when analyzing the case presented and 20% have a low development in the ability to investigate the context to intervene with the use of different techniques and instruments. The diagnosis stage is essential since the student needs to gather information from primary and secondary sources, analyze the information, ask questions, define problems and gather information that serves as evidence.

Diagnosis is an essential task in the training of the educational interventionist and corresponds to the process of collecting information from the sector where he works to identify problems and propose solutions. Diagnosis involves a series of actions related to the analysis of the reality that one wishes to transform.

INDUCTIVE REASONING IN PROBLEM IDENTIFICATION

Inductive reasoning refers to the analysis of particular situations, the recognition of patterns and the identification of problems to seek their solution. This skill is linked to diagnosis in the stage of data analysis, categorization and problem identification. It is the reasoning involved in finding problems.

51% of the students showed a high development of this skill, while 40% have developed it moderately and 9% a low development. This skill needs to be developed in students through the use of strategies that favor analysis since they reflect on situations in a very superficial way, which makes it difficult for them to identify the problem.

DEDUCTIVE REASONING AND KNOWLEDGE OF THE PROBLEM

With deductive reasoning, you start from a general premise to reach a more specific conclusion. It starts from the identification of a problem and delves into the analysis of its elements, causes, consequences, relationship with other problems and argues its reflections. 71% demonstrated the ability to start from a general idea and explain the causes of the problems, as well as the consequences, 11% demonstrated that they require support to develop it, but 18% showed low development.

PROBLEM SOLVING AND INTERVENTION DESIGN

Problem-solving skill refers to generating potential solutions to problems that are relevant. This skill is very important for the educational interventionist who must design an intervention alternative to solve the problem identified in the diagnosis. According to the results of the questionnaire, 65% of the students showed that they had developed this skill since they proposed viable solutions to the cases presented, diverse and interesting,

31% showed that it was more difficult for them to propose the solutions and 4% had difficulties in generating solutions. Problem solving involves reviewing the literature and knowledge of reality for the design of the educational intervention.

DECISION MAKING DURING INTERVENTION MONITORING

The ability to make decisions is very important for the educational interventionist since he or she will have to make decisions at all stages of the intervention when facing difficulties inherent to the process and seeking solutions. Furthermore, during the monitoring stage of the intervention, he must be aware of any situation that hinders the development of the planned actions in order to make the decision to make changes. 69% of the students demonstrated that they had developed this skill, 16% needed to develop it even more and 15% demonstrated difficulties making decisions. The above reflects that the student must develop the ability to make decisions when in the process of an educational intervention with any social group and/or context. 64% of the students were able to clearly and completely argue their decision-making and 36% argued their answer incompletely.

THE EVALUATION OF THE INTERVENTION AND THE PROJECT

The ability to evaluate requires the student to review evidence before and after the intervention, establish judgments about the results and feed back the proposal with new alternatives to improve the results based on the evaluation of the objectives with the results. 80% of the students demonstrated that they had developed this skill, 11% showed that they needed to develop it even more and 9% had serious difficulties in evaluating. Reflection on the intervention process and

its results is essential to identify aspects for improvement.

THE ARGUMENTATION DURING THE INTERVENTION PROCESS

Argumentation is the ability to have reasons, explanations and evidence for proposals, responses and solutions to a situation. The argument is the result of a wealth of experiences lived by the student to explain the reasons for his statements as a result of theoretical-practical reflection in dialogue with others and with himself. Students need to develop the skill of argumentation, so it is suggested that teachers develop didactics focused on the development of the student's critical capacity with the use of different teaching strategies that promote reflective learning and develop critical thinking. It is important that teachers promote the development of the skill of argumentation since in the evaluation of the different skills it was identified that of the 74% of the students who gave correct answers to the items, only 67% made a complete argument. The theoretical argument to interpret the results implies an important intellectual effort for students who begin a new intervention process.

CONCLUSIONS

Of the 55 students who answered the questionnaire, only 75% have demonstrated that they have developed the evaluated skills and 25% need to develop them, otherwise they will have difficulties carrying out the intervention project in the workplace. The skill in which the students had the greatest difficulties was inductive reasoning, requiring them to analyze the information and identify the problems to which they must later offer solutions. In this sense, UPNECH professors must promote methodologies for their development since, as Betancourt, et al (2017) mentions, universities are committed to training autonomous, flexible and entrepreneurial professionals with the ability to think autonomously and critically. Therefore, it is suggested that the formal higher education curriculum establishes the development of critical thinking as one of its priorities and that universities ensure that the curriculum put into practice is oriented towards achieving its goals.

The university curriculum must be oriented towards social research that seeks to transform reality through the active participation of different professionals, especially education professionals. With the results of this research, a new line of research is opened aimed at developing the curriculum at the university to enhance students' critical thinking.

REFERENCES

- ANUIES. (s/f). *La educación superior en el siglo XXI. Líneas estratégicas de desarrollo*. Recuperado el 23 de abril de 2019 en: <http://planeacion.uaemex.mx/InfBasCon/LaEducacionSuperiorenelSiglo>
- Betancourt, S. et al. (2017). *Evaluación del pensamiento crítico en estudiantes de educación superior de la región de Atacama-Chile*. Prospectiva. Revista de trabajo social e intervención social. No. 23. Enero-junio Pp. 199-223. Facultad de humanidades. Escuela de trabajo social y desarrollo humano. Universidad del Valle. Chile.
- Facione, P.A., (2007). *Pensamiento Crítico: ¿Qué es y por qué es importante?* Recuperado el 20 de abril de 2019 en: <http://www.eduteka.org/PensamientoCriticoFacione.php>
- Halpern, D. (2006). *Halpern Critical Thinking Assessment Using Everyday Situations: Background and scoring standards (2^o Report)*. Un published manuscript. Claremont, CA: Claremont McKenna College.
- Halpern, D. F. (1998). *Teaching critical thinking for transfer across domains: Disposition, skills, structure training, and metacognitive monitoring*. American Psychologist, 53(4), 449-455.
- Halpern, D. F. (2012). *Halpern Critical Thinking Assessment: Test Manual*. Mödling, Austria: Schuhfried GmbH.
- La Fuente, M. (2009). *La Experiencia del Sistema Nacional de Evaluación del Proceso Educativo, SNEPE, en Paraguay. Aprendizajes y desafíos*. Revista Iberoamericana de Evaluación Educativa, 2(1). Recuperado el 27 de abril de 2019 en: http://rinace.net/riee/numeros/vol2-num1/art3_htm.html
- Marzano R. J. y Costa, A. (1988). *Question: Do Standardized Tests Measure General Cognitive Skills? Answer: No. Educational Leadership*, 45(8), 66-71. Recuperado el 3 de mayo de 2019 en: http://ascd.com/ASCD/pdf/journals/ed_lead/el_198805_marzano.pdf
- Ossa-Cornejo, C.J., Palma-Luengo, M.R., Lagos-San Martín, N.G., Quintana-Abello, I.M., & Díaz-Larenas, C.H. (2017). *Análisis de instrumentos de medición del pensamiento crítico*. Ciencias Psicológicas, 11(1), 19 - 28. Montevideo. Universidad Católica de Paraguay.
- Ríos, J.M. (2016). *Formar profesionistas críticos, reflexivos y sin miedo: retos de la educación superior*. Conferencia dictada el martes 12 de enero en el Centro Universitario del Sur de Ciudad Guzmán, Jalisco, organizada por la Coordinación de Comunicación Social de la Universidad de Guadalajara, México. Recuperada el 2 de mayo de 2019 en: <http://www.cusur.udg.mx/es/noticia/formar-profesionistas-criticos-reflexivos-y-sin-miedo-retos-de-la-educacion-superior>
- Saiz, C. & Rivas, S. (2008). *Evaluación en pensamiento crítico: una propuesta para diferenciar formas de pensar*. Ergo, Nueva Época, 22-66. Recuperado el 2 de mayo de 2019 en: <http://www.pensamiento-critico.com/archivos/evaluarpcergodf.pdf>
- Tuirán, R. (2019). *La educación superior en México: avances, rezagos y retos*. Recuperado el 2 de mayo de 2019 en: http://online.aliat.edu.mx/adistancia/Calidad/unidad4/lecturas/TXT_1_S4_EDUC_
- Tung, C. y Chang, S. (2009). *Developing Critical Thinking Through Literature Reading*. Feng Chia Journal of Humanities and Social Sciences N° 19, (p.p. 287-317). Taipei: Feng Chia University.
- Yang, Y. T. (2012). *Cultivating critical thinkers: Exploring transfer of learning from pre-service teacher training to classroom practice*. Teaching and Teacher Education, 28, 1116-1130.