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Critical thinkingin educational environments

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Abstract ;

To the above, we find that critical thinking in modern education has become a pillar that has to successfully address the challenges and impediments that inhibit the attainment of its competence, and this needs the following:
-Incorporate critical thinking in curriculum through activities and questions that demand analysis interpretation, comparison and conclusion over basic memorization and rote learning. Developing learning units that add value to problem solving and decision making.
-The training of the teachers in the teaching skills of critical thinking and equipping them with tools and means on how they can incorporate the critical thinking skills into different subjects.
-Incorporate critical thinking in university education, particularly graduate education in different fields and educate them in how to infuse and apply it in their respective educations

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1. *Introduction*

God Almighty created human in the best of stature, dignified him, in comparison with all other creatures, with reason, and bade him to think and ponder his kingdom. People are born with power to think, and they can use this power to deal with the daily life and gain the experiences which can shape them through the steps of their physical and mental evolution and express their character.

Thinking is the most salient of human capabilities, and thinking being the instrument with the help of which human beings cognize the world, make judgments, and make choices, there is the need of a deep and conscious mode of thinking in the era of rising amounts of information and disagreements. This helps one to be more inclined to determine what is right and what is wrong, not being distracted and deceived by shapes. Thus, a psychological weapon was required to empower humans and drive them to challenge. This instrument enables them to look with a critical eye, which balances words and actions with the weights of reason and evidence. This is the instrument of critical thought, which is the foundation of adult cognizance and rational judgment.

2. *Critical thinking:*

2.*1 Meaning and significance:*

Critical thinking in the English language is a linguistically related word that is derived in Latin, which is: kritikos, a Latin word, translates to discern or make judgment. This linguistic definition of the Greek term justifies the conventional ancient understanding of thinking, which was defined and accepted by the three philosophers Socrates, Plato and Aristotle and which could be condensed to the conviction that the art of analysis, judgment and argument could be employed in the establishment of the truth (Musa & Mubarak, 2021). This traditional view of thinking has an effect on the concept of critical thinking in education in our time.

Educational researchers provide numerous different ways of defining critical thinking, as it is a complicated concept that is associated with an unlimited number of behaviors and unlimited number of situations and topics and the relation to other concepts like logic, problem solving, learning, and epistemology. This has created controversy among scholars in relationship to the nature of critical thinking based on their various philosophical, theoretical and cultural heritage as well as the numerous schools of thought that have discussed critical thinking.

Watson and Glaser described the process of trying to prove facts and opinions according to the evidence that justifies them in question instead of making

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conclusions. It is thus the familiarity to logical research techniques which assist in establishing the worth of the various evidence materials, making valid conclusions, attempting to verify the validity of the conclusions and discussing the discussions without subjectivity (Al-Aliani, 2006).

According to Bayer, critical thinking is mental abilities that have a preoccupation with formulating criteria and standards, using criteria, evaluating situations, information, and experience against these criteria and making arguments and evaluating logical relations to arrive at sound conclusions. It incorporates also emotional tendencies and dimensions the most crucial of which are the need to know, open-mindedness, and be able to comprehend alternative points of view (Mustafa, 2002).

Ennis maintained that logic, reflective thought is grounded in coming up with hypotheses, posing questions, and testing them and that such thought is what would dictate what we believe and what we do (Jabr & Al-Qattan, 2008).

Fisher determined it to be the capacity to balance the information and ideas and judge arguments to make balanced judgments.

The definition of Russell focuses on the correct perception of the situation and judgment of arguments and objective facts in drawing judgments and decisions without emotion involvement. He views it as an evaluation or categorizing process based on an agreed and pre-existing standard and a logical evaluation of facts devoid of emotional undertones (Al-Zaghloul, 2012).

Arab educators didn't emerge further then the western in their interpretation; that critical thinking is the constant mental activity of the individual to challenge the facts or views in accordance to a certain set of rational and logic, in order to explore the evidence and find out the indicators without going directly to conclusions. This presupposes knowledge of logical research techniques that would assist in establishing the worth of various pieces of evidence in order to reach sound conclusions, test the validity of said conclusions and assess conversations in a wholly objective light. Critical thinking is the kind of mental activity that a person resorts to when he or she is presented with a question, a subject matter to be discussed, or an opinion to be given (Al-Huweidi & Jamal, 2003).

Magdy Ibrahim defined it as a mental process comprising a complex of thinking skills that could be applied separately or combined without being subject to a certain order to check something or an object and assess it according to certain criteria in order to make judgment on its value or arrive at a conclusion, generalization or decision (Ibrahim, 2005).

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Critical thinking is also described as a self-directed process of thinking that follows the principles of logic and reasoning, which is a skill-based set of rules that enable the person to assess the knowledge she uses and define how correct and objective it is in regards to the set of the available reasons that lead to conclusions about knowledge and situations to make the appropriate decisions and to reach effective solutions to the problems that the human being encounters in life (rayan, 2011).

It was defined by Fakhri Al-Falah as thought operated under provisions of logic, analysis, and as the result of various manifestations of thought, including knowledge of assumptions, interpretation, evaluation of discussions, deduction and inference. He perceives it as an evaluative process whereby, the rules of logical reasoning are applied when it comes to handling variables, He also takes it as a complicated process of skills and penchants (Al-Falah, 2013).

However, Sanaa Suleiman views critical thinking as reflective and rational thinking that is aimed at making decisions and what that involves in terms of formulating hypotheses, questions, and experimental plans. It assists in the resolution of problems or verification and evaluation of something by pre-determined standards. The thinking in question demands that three upper levels of thinking in the classification by Bloom, which are analysis, synthesis, and evaluation, are used (Suleaiman, 2011).

In spite of various definitions of critical thinking, they have shared characteristics of describing that it is a thinking pattern which will prove or confirm that a person is able to analyze, evaluate and synthesize ideas and evidence, and to make judgment and conclusions which are rational and not influenced by prejudices and individual inclinations.

Others have defined it by an objective of stating the traits of a critical thinker whereby such a person is (Jaroun, 1999):

-Open to new ideas.

-Being aware that they should know something more.

-The difference between a conclusion that can be made and a conclusion that needs to be made.

-Being aware of the fact that different people have various perceptions concerning the meaning of words.

-An attempt to prevent typical fallacies in their arguments.

-Doubting anything that does not appear to be reasonable or understandable to him or her.

-Attempts to give up emotional thinking to the logical thinking.

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-Strives to develop their vocabulary so that they could get to know what other people are saying and could express their thoughts in clear words.

-leaves or abandons a post when there is reason and sufficient evidence so to do.

-He is careful about everything about a situation.

-He seeks the reasons and alternatives.

-He is systematic in handling the elements of a complicated situation.

-He cites and reads good scientific materials.

-He remains in touch with the key point or the content of the subject.

-Clearly defines the problem.

Learning such manners in Maya when the information is streaming on all sides and facts are bundles of opinions and rumors if these methods safeguard individuals against misinformation and allow them to choose what is right and what is wrong. Critical thinking is not merely an academic ability, but a lifestyle that facilitates us to comprehend what is happening around us willingly and make healthy choices in our education, labor and even in our day-to-day events. The secret is the critical thinking that provides us with the possibility of looking at the things as they are, analyzing the pieces of evidence in a clear and rational way, and not being influenced by emotions or blind following. Al-Halaq is of the opinion that the significance of critical thinking is that it converts a passive process of learning knowledge to a mental operation resulting to mastery of scientific content better, minimizes erroneous explanations and serves to monitor and regulate the thinking of students. Consequently, their thoughts are improved and closer to the truth, thus enabling them to make judgments in their lives, and prevent them being emotionally motivated and extreme in their views (Al-Hallaq, 2007).

Besides, critical thinking :

-results in a better appreciation of the knowledge content of the learner.

-brings the learner to independence of his/her thinking and liberates him/her of the dependency and self-interest.

-Promotes the culture of investigation and visiting, and refuting the facts without enough verifications.

-Makes school experiences significant and makes the learner have a more intention to apply and practice them.

-It increases the level of the achievement of the learner.

-It made the learner more positive, interactive and engaged in the learning process.

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-It will increase the capacities of the learner to seek solutions to their problems and make the right decisions concerning their problems.

-It makes the learner self-confident, and boosts his or her self-esteem.

-It gives the learners a platform to grow, develop and think creatively (Abwi, 2008).

Critical thinking is essential to the life of learners, which does not close to their time at school. It is not merely an educational proficiency, but a life proficiency that allows one to act consciously on how to utilize information in order to tackle problems and be actively involved in creating an informed and sophisticated society. The creation of active citizens who are independent, responsible, and ultimately active is a long term investment in the creation of critical thinking in school through:

-Giving the learners the skills and tools needed to cope with the challenges of the knowledge explosion era.

-Care of the young minds against the negative impacts and misconceptions of the society.

-Building of people who can offer a compromise between the new and the international, national and cultural identity.

-Assistance to solve social and physical issues within the society in a manner that contributes towards seeking the right solutions to the issues flexibly, objectively, and rationally.

-It makes people integrate remarkably to the society and its changes through teaching people about communication and scientific education (Mahmoud, 2005).

Social interactions and development of science and technology are supported by critical thinking. It is also an effective part of the educational process as it has become an educational necessity that teachers and those, who control the educational process, should consider and enhance in students because critical thinking will change the traditional educational setting to a setting where discussion, communication of criticism, respect towards the opinions of others will become the most common features.

In order to reach this advantage, it is reasonable to concentrate on the following aspects:

-Incorporating the subject and allusions to this kind of thinking in terms of content, goals and the process of teaching and learning this type of thinking into the curriculum.

-Concentrate on the quality but not the quantity and treat students as those who possess enough skills in order to gain this intellectual skill.

-Create an environment in the classroom, which promotes discussion, questioning,

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disagreement and reflection, and such methods of studying are centered on real, realistic problems, in which the experience and age group of the students are considered.

-Cultivating the sense of trust and safety between the teachers and students, promoting reflection, discussion, and group discussion, believing in consultation, freedom of thought, and respect to the views of others, even when they are different.

-Teachers need not take the initiative and engage students in leading lessons and not following rules strictly, which may lead to frustrations in students.

-Use assessment tools, which target advanced levels of thinking and nurture them by posing controversial issues or views.

-Teaching the students to a patience of not rushing in judgment until they have evidence and proofs to back this up.

-Emphasis on identifying talented and creative students and sponsoring them both financially and morally and giving them the tools and mechanisms to bring out the creative nature among students.

2.2*Critical thinking: how to develop skills of critical thinking and what are the difficulties in executing them.*

The ability to think critically is a significant educational objective that education systems in different levels and levels of education are targeting to nurture, as it would prove instrumental in shaping critical skills in scientific and social facets in learners. We discover that they leave superficiality in handling things and subjects and are inclined to doubt and enquire and not to accept facts that have not been investigated.

Teachers vary in critical thinking ability as they vary in the concept of critical thinking because they have different ideas, interests, nature of studies and theoretical foundations that they adhere. The list below is a demonstration of critical thinking skills as described in some books and research:

Most critical thinking skills listed by Grun include (Qatami, 2000):

-Drawing the line between provable facts.

-Separating information, claims and methods that are related and not related to the subject.

-Ascertaining information accuracy.

-Estimating accuracy of the source of information.

-Awareness of the uncertain statements, arguments or data.

-Identifying the implicit assumptions.

-Investigating bias.

-The identification of logical fallacies.

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-Noticing contradictions to argument or conclusions.

-Ascertain the quality of evidence or statement.

-Design a choice concerning the topic and establish a viable foundation of actual action.

-Anticipate the effects of the decision or solution.

-Watson and Glaser put a summary of the fundamental skills of critical thinking as follows (Ibrahim, Educational Perspective of Thinking):

-Recognize assumptions.

-Interpret.

-Deduction.

-Conclusion.

-Evaluating arguments.

The art of recognizing assumptions means the power to distinguish the extent of truth of certain information, to make a distinction between fact and opinion, and realize the intent of the information presented.

The interpretive skill refers to the skill of determining whether there is a generalization and conclusion founded on the specific information based on the ability to recognize logical explanations and identify the problem.

The inference in skill is used to describe the capability of an individual to determine some conclusions with reference to premises or previous information.

Skill of inference refers to the capability of a person to make conclusions based on some facts that he/she observes or supposes, and to know whether the conclusion is right or wrong as per the facts presented.

Evaluation of arguments is the aptitude of a person to assess imagining a point and concur or not concur, distinguish primary and secondary sources, effective or feeble arguments, and rate the sufficiency of information.

Al-Atoum and his associates stated that the classification of the skills of critical thinking as used by Facione was as follows (adnan & al):

-Interpretation.

-Analysis.

-Evaluation.

-Reasoning.

-Explanation.

-Self-organization.

The trait of interpretation is to reply to and convey the meaning of various circumstances, information, and experience based on various standards and regulations. It consists of a number of

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skills, including classification, inference, and clarification.

Analysis implies the separation of inductive and deductive relationships and linking ideas, concepts, and characteristics. The most valuable skills of it are the analysis of performance and finding and exploring arguments.

Evaluation means the skill to determine the validity of the words or the correctness of the way a person sees things, and takes the sub-skills of evaluating claims and evaluating arguments.

The inference is the application of the acquired data and facts to make logical conclusions, and it contains the ability to analyze evidence, to guess alternative possibilities, and to make conclusions.

Explanation refers to the process of giving reasons and justification of the findings of the thinking on the basis of evidence, ideas, context and arguments. Its competencies include: announcements of results, justification of actions, and argumentation.

Self-regulation involves the capability of an individual to doubt and check the validity of findings and reason out. There are two skills one, self-testing and self-organization.

One of the most significant instruments that a teacher should have in order to grapple with the knowledge and life is critical thinking skills, which imply the ability to analyze, interpret, reason, and evaluate. Nevertheless, these are not developed naturally, and they must be developed consciously and systematically.

This is where contemporary curricula enter in. These ought to be structured so as to promote questioning and research, not memorizing and indoctrination. Dialogue-based, discussion-based and problem solving methods of teaching can also be used to develop a fertile environment in which the mind may be trained to think critically. Moreover, the role of formative assessment in the development of this skill lies in the fact that it is aimed at monitoring the progress of the learner and offering positive feedback which would assist him/her in revising the ideas and developing them. Using this combination of curricula, instructional and assessment approaches, critical thinking can be built up to a sound cognitive activity among students.

The environment where this skill is taught should also promote the thinking process and offer the learner an opportunity to work with real life situations and scenarios. Education is in such an atmosphere.

student-based, where collaborative teamwork, interaction, and cooperation between students and teachers are encouraged. It gives the students the chance to defend their views, argue out their views, respect the views of others, and

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criticize them in an objective way pointing out the positive and negative sides. It promotes exploration and an interest in learning and helps students to take responsibility of what they study.

The critical thinking education programs depend more on teachers. They become the mentors of the educational process with the ability to assist student to grow mentally and cognitively in a progressive way with proper curriculum and instruction that consider the maturation of the society and the various mindsets of this generation, shunning rote learning and passive reception without being part of the education process.

It is done by means of allowing students enough time reflect and think, offering students opportunities to discuss and converse, stimulating students to use the skills of critical thinking and curiosity, giving students acceptance of their views, appreciation of their ideas, considering their personal differences, and building their self-confidence.

The following are some of the roles played by the teachers in promoting critical thinking amongst the students (Majid, 2008):

-Educational process planners are teachers.

-Classroom environment is made by the teacher.

-The teacher is proactive: with the help of various materials and activities, offering students to situate based on the solutions to the actual problem and proposing ways of problem-solving scenarios, and employs the technique of questioning to engage students.

-The instructor is an object of knowledge.

-The teacher is a kind of explorer because by even posing questions that are deep and probing, his or her questions have to be justified or supported with ideas, hypotheses, and conclusions.

-The teacher plays a role model as a role model by showing his behavior, which indicates that he is curious, critical in his thinking and reading.

In order to instruct such a skill, the teacher does not just assume a conventional role of a disseminator of knowledge, but assumes several roles in the process, both as the lesson planning and curriculum design and as the application of different strategies such as the probing questions and problem solving. Here the role of the teacher as a source of learning and role model on behavior and thought is brought out. Nonetheless, training of this skills can only be finalized through offering a participatory classroom atmosphere which motivates learners to engage in discourse and discussion and value other points of view.

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As Abu Ghazaleh and Al-Qawasmeh also indicated, the task of teacher in teaching critical thinking is as follows (qawasmeh, 2012):

-The teacher selects the topics and problems with no consensus.

-Strategies in thinking are taught directly.

-Training students on the various skills of thinking.

-Giving the learners time to elaborate on the concepts.

-Presenting information to students using all the graphs, maps, and charts in a visual manner.

-Providing the illustrations of various views on a particular problem.

-Not answering the students of any level disrespectfully.

Thus, the application of modern teaching techniques and strategies in teaching will foster critical thinking, which premises on the role of student as the center of teaching process, in order to nurture their critical thinking and form an independent personality, thinking of events and phenomena.

It also involves the enrichment with critical thinking skills of curriculums and texts, and seeing their authorship to devise problems as a form of lesson that the student needs to use their own thinking in finding a solution to it, as well as in connecting it with their reality and problems. People working on the curricular of different subjects should aim at ensuring that they are related to the environment and the society i.e. made practical and valuable such that the learners can feel the significance and value of the same. The curricula must not be according to the amount of information but according to the quality of information and the acquisition methods with considering the mental capacities that a student is able to undertake at a particular age level.

In case we wish our children to succeed in life, we should educate them how and how to think and what to do and not on how to get the information and the knowledge ready-made which is quickly forgotten by the scientific discoveries. Their training in producing knowledge will not be complete, unless our children are taught how to contribute towards producing it, and this means that they will not be well equipped to meet the new demands and situations that they will come across in their lives. Faith also needs thinking in finding the laws of life.

Formative assessment is not just one of the ways of tracking the performance of a learner, but a strong educational instrument to build his or her critical skills because it helps the learner to be more aware of their errors, ask questions and solve persuasive arguments and keep checking his or her thoughts over and over again. By giving positive feedback and

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engaging themselves in the process of self-evaluation and evaluation of others, the learners will be more autonomous and well-thinking. This renders formative assessment as a key tool towards the standardization of the capability in critical thinking within the teaching framework.

As the student is the central part of the teaching process, students are the basic actors of the learning environment, which promotes the development of critical thinking skills because they acquire an active role which moves beyond the stage of reception to the stage of participating in knowledge building. They share the information and ideas with their co-workers, raise new questions, investigate alternative data, and want to find some unconventional ways of solving the problems. Moreover, they resort to plethora of sources of knowledge and apply it to educational circumstances, which boost their ability to think critically, analyze and be creative.

Although numerous advantages of teaching critical thinking and its range of skills are recognized by the educators and people interested in teaching strategies and approaches to the curriculum, there are numerous barriers and issues that inhibit these objectives. The most widespread of them are those that teachers experience when they wish to teach critical thinking, i.e.: (Thinking Skills: Developing, cooperation between Al-Atoum and others, p. 93.)

-The students anticipate that the teacher would provide certain answers rather than them coming up with these answers by analyzing, criticizing, and thinking seriously.

-There are impatient students who go out to discuss alternatives, hypotheses before effectively studying and reflecting on the situation.

-Some students will exhibit unwillingness to communicate the ideas of other students or the ideas presented to be discussed.

-There are students who do not think properly when required to form or come up with alternative or hypothesis of the situation.

-There are students who enter into conversations with others without possessing the theoretical or even the basic information to take part in the discussion.

-Several challenges to this form of education are thus seen to curtail the realization of its goals whether concerning the curriculum, the teaching strategies, the learning environment per se or the nature of the learners themselves including;

-The stereotypical way the teacher presents the curriculum material, applies outdated techniques and strategies, relies on tutoring students without engaging them in the learning process, lacks interest in training this line of thinking in the students.

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-Crammed classrooms with too many students and everybody is different.

-The unwillingness of students to go into the depth of thought and comprehension, the lack of tolerance and bias of some of the students against the opinions of others, and the fear of confronting facts that might result in a shift

of their opinions, beliefs.

-The school system is under numerous restraints and norms and holiness of the prescribed textbook turns it into the sole source of information of students and teachers, undermining the advantage of the incredible burst of enlightenment. This is a limitation to teachers as their freedom of choice is limited and it becomes hard to create a democratic classroom atmosphere where questioning, dialogue, and thinking are encouraged.

-The type of questions is based on the fact that students are able to memorize and recall information, but not to apply, analyze, and evaluate information.

-Most of the teachers are attached to their perception and do not accept the ideas of students that do not correlate with their own ideas and seldom allow them to discuss questions beyond the topic of the lesson and its different aspects.

-Curricula have no activities to facilitate the aspect of thinking and students do not get sufficient time to think as teachers are compelled to cover their syllabus before the school year ends.

4. *CONCLUSION*

To the above, we find that critical thinking in modern education has become a pillar that has to successfully address the challenges and impediments that inhibit the attainment of its competence, and this needs the following:

-Incorporate critical thinking in curriculum through activities and questions that demand analysis interpretation, comparison and conclusion over basic memorization and rote learning. Developing learning units that add value to problem solving and decision making.

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