# Antonio Gramsci, Education and Science

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## Abstract

*This paper explores how the ideas of a great political thinker and philosopher Antonio Gramsci, are relevant to education and science and to critical science education. One of the main points in Gramsci's analysis is the social value and impact of certain aspects of the superstructure. He understands that education is a means which can be used for the reproduction of the social structure and that science and its uses may, in a certain way, replace religion in its function of justifying existing social structure. In analysing the role of education in capitalist society, he attempts to suggest a different use and hierarchy for education and science, moreover, one that can empower counter-hegemonic action for social change.*

**Key Words:** Gramsci, education, science, metaphysics, historical materialism, critical

## Gramsci and Italy in 1920s

In 1922 the fascist regime in Italy began. The communist movement was at first skeptical as it expected that the bourgeoisie would find the fascist solution in contrast with their interests (Hoar, 1980, p.11). This expectation was dashed after Matteotti's[1] murder in 1924. Instead of collapsing, Mussolini's regime banned in 1926 the other political parties and arrested the other members of the parliament (Hoar, 1980, p.12). Antonio Gramsci, an elected representative of the communist party, was also arrested in Rome and placed in solitary confinement, where he died in 1937 (Hoar, 1980, p.13).

Antonio Gramsci was born in 1891 in Ales, Sardinia. In 1911, he won a scholarship to the department of literature in Turin. He was first a member of the Italian socialist party, (PSI) and, after 1921, of the Italian communist party (PCI), playing a key role in both. In 1919 he participated in the foundation of the newspaper "*L'Ordine Nuovo"* a newspaper deeply involved with the working-class movement in Turin. His writings can be divided in two groups: the pre-prison political writings (1910–1926) and his Prison Notebooks (1929-1935) (Gramsci, 2005a, pp 7-11).

Gramsci's thoughts are unique and radical for his time. The social formation in Italy and his own origins influenced his approach in Marxism. After 1960, when his writings were published worldwide, the non-deterministic approach in Marxism was based, among others, on Gramsci's analysis. The non-Marxist historians of the subaltern class were also influenced by his practice and aspects of culture (Hobsbawm, 2011). He was not just an academic but also a leading political activist

[1] **Giacomo Matteotti,** (May 22, 1885—June 10, 1924), Italian Socialist leader whose assassination by Fascists shocked world opinion and shook Benito Mussolini's regime. The Matteotti Crisis, as the event came to be known, initially threatened to bring about the downfall of the Fascists but instead ended with Mussolini as the absolute dictator of Italy.
(http://www.britannica.com/EBchecked/topic/369651/Giacomo-Matteotti)

whose practice influenced his theory (Hobsbawm, 2011). Gramsci sets as priority for socialism not only the socialization of the means of production but also the formation of habits of the "Unitarian human" [2](Hobsbawm, 2011). According to Gramsci, labour plays an important role in the educational process in society as every social order is transferred through work, through every organization and practical activity of man (Hobsbawm, 2011). Labour reproduces the social rules in a constant way. Production not only supplies society with goods but also forms members of society who are used to certain ways of behaving. Gramsci is concerned about labour and education so to form another, different type of member of society, in the attempt to create another type of society.

**Beliefs about science in the contemporary world**

The contemporary world in the 20th century is often presented as completely bound up with the relationship between cause and effect (Gramsci, 1973). Even the earliest Marxist writings are based on this belief- that if we describe a total of laws, we can predict a particular historical development (Gramsci, 1973). Gramsci, however, reverses this simplistic belief through a non-mechanistic understanding of historical materialism. He explains that causality is not a simple procedure and that there are factors in science and in history that cannot be predicted *a priori*. He is also opposed to Bukharin's view that describes science as a method not linked with history[3] (Thomas, 2009 p.313). Gramsci distances himself from an idealistic approach of science by giving an example from quantum mechanics (Tassani 2004). This new field in physics started a debate about the kind of phenomena that can be observed and about the flexibility of the reality that we understand (Gramsci, 1973). This debate automatically sets frontiers in science and returns to metaphysics. According to Gramsci (1973), scientists must realize that their means of research determines the kind of the results that they have.

Gramsci concerns himself with aspects of the superstructure that reproduce the dominant ideology. Science is one of these fields. It is a very special type of ideology, as it contributes also to the development of the economic base. So there must be a critique and a proposition for the use of science in an alternative way, more directed to social needs. Gramsci (1973) believes that science and scientific facts must be organized as part of everyday life. Science and scientific practice is one of the ways of 'understanding' the world (Thomas, 2009 p.313). According to Gramsci, science should be the dominant worldview in order to not accept ideological illusions. Gramsci attempts to resist to the tendency to face science with a "religious" faith. Science is often presented as an external factor that will give automatically solutions to the problems of the society. So there are great expectations from the scientific achievements. Gramsci tries to explain that science is an element of the society that determines its priorities according to the social conditions. Science as part of the

[2] Gramsci believes that social behaviour must not be imposed. A member of society must have an automatic and conscious behaviour. This transformation will help the formation of different kind of relation between the members of the society.

[3] Bukharin finds similarities in the development of natural and social sciences. He states that theory and practice must be united so to have a different type of social cognition. The application of scientific knowledge in production is presented as the key to have a different organisation of society. (Bukharin, 1931)

philosophy of praxis could be liberating from the metaphysical aspects and beliefs of everyday life and support the struggle for social change.

The ideological role of science can be detected in the fact that, at an historical point, science was incorporated into religion, resulting in different systems of knowledge not being accepted as part of different religions. For example the western Christian church accepted Arab mathematics only to a limited extend (Gramsci, 1973). At the same time science is rarely presented as an objective fact but as a part of a general hypothesis. So, the hypothesis and the scientific facts can be distinguished and evaluated and different social groups can exchange scientific facts and certain or not hypotheses (Gramsci, 1973). For example scientific facts from a society with a different religion can be accepted without the acceptance of the other beliefs.

The uses to which science can be put are very important to Gramsci. Over and above the benefits that science gives in every day life, it can be presented as something outside society that will solve any kind of problems without man's intervention. So the result is that the power that everyone has is diminished, due to this perspective and science becomes a new type of religion. The proper information of the working class about the condition and the features of science could be a means to liberation from the dominant ideology, that of the ruling class. With this in mind, he suggests paying attention to the way that science is popularised. (Gramsci, 1973)

**Science and metaphysics**

Gramsci's major concern is the appearance of metaphysics in science. In his time there was a tendency from scientists, such as Eddington for example, to argue that there are fields in science that can't be researched. This belief divided phenomena into two categories, those that could be researched and the others that didn't have logical explanations. Gramsci in the other hand does not believe that science has frontiers which can not be researched. He wants to make clear that everything that is not known to science is a result of lack of experience and research. Gramsci (1973) insists on the fact that the development of scientific tools and the intelligence of particular researchers can arrive at new discoveries in the fields of science.
Quantum mechanics, as a new scientific subject of his time, was a clear example for Gramsci of a return of metaphysics in science. During his time there was a notable tendency for views of everyday life to change in response to a series of new discoveries in physics. Gramsci (1973) insists on the point that ordinary life accepts no effects when relations and sense of material things are preserved. For example, the sense of solid materials doesn't change even if there substances are atoms and vacuum. If we have made no change to any basic point of life, everything keeps on being organizated, as it was before, and preserves its own position.

In his attempt to expunge metaphysics from science, he makes clear that, what is common in every definition of science, is the description and the understanding of the phenomena and therefore reality. Some facts in this reality are recognized by everyone in society and must be strengthened against superstitions and other ideologies that Gramsci calls "common sense". "Common sense" is, according to Gramsci, a total of beliefs that are very common and reproduced in society. These beliefs are based in religion, superstitions or other ideologies and interact up to a point with scientific facts. These beliefs are very strong and cultivated also by social

structure and religion. Science according to Gramsci (1973) has a universal acceptance for the facts that it presents, as they are considered as "reality", and is used for scientific or religious justifications. For example the solar system in his time was accepted and used for further scientific or religious hypotheses. Scientific questions must also be rigorous against certain perceptions that have no logical arguments so that they are more difficult to be dislodged (Gramsci, 1973, p.95).

Gramsci insists in the importance of the transformation of the "common sense" into "good sense". For Gramsci this notion is very important for the formation of the new members of society. For Gramsci "good sense" represents a way of thinking that does *not* depend on superstitions or emotions. "Good sense" in society sets other priorities in social dialogue and cultivates among and within members a different way of participating. Social decisions affect directly or indirectly every member of society so "good sense" represents also the sensitivity to act for the benefit of the group as it is also everyone's benefit. This new level of awareness will help the working class to act and recognize its role in history and lead people to see that philosophies and belief systems such as ideologies are socially produced (Thomas, 2009 p. 374)

**Metaphysics breaks down the relation between object and subject or between the observer and the phenomenon**

Gramsci (1973) is very concerned about the role of the scientist in the experiment. This question about the scientist determining what s/he observes, also concerned neurophysicists such as Mario Camis, who declared that such doubts question the existence of the world outside people's activities or interpretations. At that time there was a scientific debate about the scientific observations and if they exist due to "special" skills that some scientists have.

Gramsci (1973), starting from Camis' point, wonders, if there must be a kind of "faith" in certain scientific facts, instead of independent scientific researches, appeals of perceptions and finally new syntheses that evolve science. Every new piece of data depended on the scientist's subjectivity, the social situation that s/he faced, but also on the condition of the scientific tools that s/he could use. Finally, the scientific community plays a considerable role in the development of science, as after a certain amount of research, it takes a fact for granted so that in subsequent research it can be either confirmed or denied. In this way, a new synthesis of scientific data arises alongside historical development.

Of course, there are certain difficulties which arise when describing a new topic in science. According to Gramsci, this arises from the delimitations of science in each specific historical moment, as a result of technical and methodological factors. For example, scientists do not have the experience, either observational or terminological, to describe new phenomena. This is a lack of experience and not a lack of the features themselves (Gramsci, 1973).

**Doing science is not only for describing reality but also for relating it to work and its development**

Gramsci (1973) believed that science could not even begin to discover reality without interacting with society. Everyone has to consider that science would not have

developed, if it were not part of society, and part of a social culture and worldview. So scientists must focus their scientific questions on the improvement of every day life. Science develops along with history, understands that at every point has certain limits and that in the future those limits will be different (Gramsci, 1973)

**Scientific tools**

Scientific tools play an important role in the development of science especially because their development and improvement evolve. But the main scientific tools are intellectual and political. Philosophy, of course, also combines with method to make science a highly complex process! Gramsci (1973) claims that methods should develop along with science. Against the basic modern belief, that a totality of laws and methods exists in every scientific research, he restores the *dialectic* between scientific research and result, drawing on the notion of historical materialism. Gramsci also makes clear that the scientific facts are not truths which exist forever. What science does is explain and organize those unfinished truths.

**The Goal of science**

For Gramsci there is no point in thinking that science is separate from society. Its concern must not be to find reality but the human being. Science has developed because of human intervention and work in method, tools and methodology. So the goal of science must be the relation between the human and reality through technology. Humankind cannot be withdrawn from science, because without humans, there is no science. Application and interaction with other social fields affect its goals, its logic, its method etc. The goal of science must involve the elaboration and the use of reality from the whole of society and not only from a group of "experts" who explain it as they see it to the others. Every observer contributes to a collective image of reality that is open to society and not alienated from it. Gramsci (1973) shows how science can have emancipatory power for the working class. Science can replace superstition and lead to social participation. A critical scientific approach questions the "scientific justification" in social decisions and looks for another set of priorities according to the social needs.

**The scientist's role**

Gramsci questions the scientist's role in the scientific process, but also in the scientific community. The scientist participates actively in the development of science. According to Gramsci (1973), a scientist must choose either to make statistical analysis and participate in such a way as to reproduce the existing ideological apparatus or, alternatively, to analyse from a historical materialist perspective the facts. To recognize the historical, social and class factors that play a role in every development. Everything has to be taken into consideration in the development of science: the methods, the tools and the scientific language for the description of the results and the conclusion. All these matter in the quest for truth and the attitude of society and non scientists towards scientific topics.

Is there anything constant in science? According to Gramsci (1973) there are some unchangeable data which aim to examine how systematic and holistic a scientist's work can be, what kind of philosophy and methodology s/he uses. If the scientist has a

full understanding of the concepts that s/he uses, if s/he is aware of previous findings on the scientific questions s/he is dealing with, if s/he is confident of his criteria and finally if s/he is very careful in his/her recording of his/her findings and how s/he presents them to the society. S/he has also to work systematically not arbitrarily. S/he must be honest about the things that science doesn't know yet and not to silence them. Finally, s/he must not be satisfied with temporary solutions. A critical scientist dislikes rhetoric and prefers logical arguments for his/her standpoint. S/he recognizes with honesty the state of his/her research and is open to dialogue about the deficiencies and future avenues of his/her work (Gramsci, 1973).

In the field of the philosophy of praxis the 'scientist-experimenter' becomes the prototype of the new type of philosopher. The reason is that he is not just 'pure thinker', but also 'worker'. Gramsci's thought is strongly affected by practice and vice versa, until the perfect unity of theory and practice is formed (Thomas, 2009 p.315-316)

**Scientific discourse**

Gramsci believes in the power of the dialectic of hegemony in scientific debate as a process of evolving between two different opinions to another one that is enriched with elements from both and also through practice. Critical scientists are expected to incorporate the positions of their opponents into their own theory, as secondary elements. Critical thinking is useful for scientific research, as it represents a different approach to science. Critical science is not just collecting and analyzing data but also evaluating, accepting and rejecting facts with social criteria. Science isn't something neutral that always develop separated from the social events.

Scientific discourse is part of the scientific procedure. But in order to be followed by scientific progress, participants must not be dogmatic in their opinions. Two different opinions, expressed critically, can give rise to a new one which could enrich science. So we must not look for "winning" against our opponent but for searching for the truth. Every scientist expresses not one truth but others which s/he has found useful. As Gramsci notes, "…we have to be fair with our scientific opponents" (1973, p.96)

According to Gramsci (1973), scientists are intellectuals and they assume the role of instructors. Scientists should improve their standpoint with arguments and data and avoid focusing on the weak points of their opponents. They have to be aware of the deeper meaning of what one says and avoid mistaken formulations. If a scientist wants to combat one idea, s/he must debate with its best wording (Gramsci, 1973, p.94).

Scientists have to be keenly aware of the type of scientific discourse they use. Each participant increases his/her thinking by critically approaching other views. No one should be convinced automatically or emotionally.

Critical scientists must pay attention in the social impact of one's view and how one's words will be received by different social groups. In a debate, the goal must be the empowerment of critical approach and the preparation for a new condition that will have a different social significance, and which will arise from mass action and demand a different social structure.

## Scientific work

Scientific work includes efforts towards evolving the content and the techniques of science but also the search for the common component of different observations. The same phenomenon is observed by different scientists and their common points are accepted widely. Science looks for those facts that are countable using a method that stands up to scrutiny. We can say that science searches for what is objective in these particular circumstances. (Gramsci, 1973)

## Gramsci and Education

Industrial society has created new needs. The educational system was developed as a means of reproduction for the dominant ideology, but also as a means of reproduction of all kind of workers, such as managers for the productive system. At the same time, there was, and still is, a widespread popular demand for the organization of education and access to knowledge, which was also linked to the development of basic education. This development was essential for the society. So we have to ask who is education for? In Gramsci's time, schooling was a privilege only for the upper class. But it was the need to train managers for production executives that led to the development and expansion of the educational system. The upper class of the time wanted two types of schools: A humanitarian school for the upper class and bourgeoisie and a vocational school for the working class. This distinction was theoretically grounded in a liberal pedagogical approach which held that children of lower class had an "innate inclination" to this kind of education. In Gramsci's time this separation was stronger, due to the influence of Gentile's educational reform[4] (Gramsci, 2005b).

Gramsci (2005a) tries to explain historically how the modern school system developed. He declares that school has two roles – to instill the dominant ideology and win its acceptance from everyone in the productive system whatever their position in it. As an alternative to this, Gramsci (2005b) proposes what he calls the Unitarian school, based on a radically different pedagogical approach. Education is central to his particular formulation of the concept of Hegemony. How ruling by consent and not simply through force is achieved (Mayo, 2008). Gramsci's analysis is wide with lots of interest for every aspect of society. Education was a project that didn't just restrict itself to an analysis and discussion of schooling and formal

[4] **Giovanni Gentile,** (1875-1944), major figure in Italian idealist philosophy, politician, educator, and editor, sometimes called the "philosopher of Fascism." His "actual idealism" shows the strong influence of G.W.F. Hegel.
Gentile in 1917 became professor of the history of philosophy at the University of Rome. While writing *La filosofia di Marx*, a Hegelian examination of Karl Marx's philosophy, he met Benedetto Croce, and from 1903 to 1922 the two men coedited the periodical *La Critica*. Gentile influenced Croce's philosophy.
As minister of education in the Fascist government of Italy from October 1922 to July 1924, Gentile carried out wide reforms. In 1925 he served as president of two commissions on constitutional reform, thus helping to lay the foundations of the Fascist corporate state. After acting as president of the Supreme Council of Public Education (1926–28) and as a member of the Fascist Grand Council (1925–29), he saw his political influence steadily decline.
Gentile's idealist philosophy denied the existence of individual minds and of any distinction between theory and practice, subject and object, past and present. According to him, all of these categories are merely mental constructs. Mind is the Absolute, and education is the process of revelation of the Absolute. (http://www.britannica.com/EBchecked/topic/229340/Giovanni-Gentile)

educational issues (Mayo, 2008). One might argue that education played a central role in his strategy for social transformation since, in his view, every relationship of hegemony is an educational one (Mayo, 2008).

## For an alternative pedagogical approach

Gentile's educational reform was based on the view that the aim of education was the transmission of a uniform cluster of knowledge to each pupil. In reality, this favours middle class children who come from a more "educated" family environment and are more able to understand the knowledge imparted to them and can thus realize their educational potential. Working class children, on the other hand, according to this view, need to receive vocational training. This reinforces at school the class division that is in society. Gramsci (2005b) attempts to introduce another, a different, pedagogical approach based on the belief that school can and should aim to reduce class differences among children and provide a fully humanistic and vocational education for all.

Gramsci (2005b) believes that personality does not pre-exist in the child but that it depends on the social environment and develops in dialectical interaction with it. This opinion transforms the role of the teacher –against conservative beliefs – because if the student interacts with the educational framework, it is not possible to predict just one outcome. (Gramsci, 2005b)

These ideas formed the basis of what Gramsci (2005b) calls the Unitarian school. His proposal doesn't just deal with the organisation of a new school but also with the effect that the school system in general has on the formation of a child's personality. The Unitarian school is not a school detached from society and production but one part of a type of education free from prejudice and rhetoric. It would also contribute to the end of the distinction between intellectual and labor work. Everyone would have the opportunity to be a manager and an employee at the same time. Gramsci (2005b) draws inspiration from radical pedagogical methods which give another meaning to the terms spontaneity, discipline and participation. Gramsci seeks to create a school that transmits a new system of values and is able to trigger radical changes in labour and society (Gramsci, 2005b).

In the Unitarian school teachers are not just intermediaries between the society and the developing personality of the student, but representatives of the collective critical consciousness. They promote cooperation and collective participation of teachers and students. He proposes a reciprocal relation between teachers and students that questions the hierarchical relationships (Mayo, 2008). The two-way connection between teachers and students is also expressed outside of the school in the entire community. The reciprocal educational relationship that he advocates exists throughout society as a whole and for every individual relative to other individuals (Mayo, 2008). Teachers don't just present knowledge and facts but they promote an active process of interaction and collective practices among students (Gramsci, 2005b). Their goal must be to form a collective process of learning and deciding so to stop the reproduction of managers and workers in society. In other words teachers must work for the distinction of the social division of labour and its replacement by collective processes in production.

## School and social activity

Gramsci (2005b) suggests that in the Unitarian school there would be a direct connection with society. Students would be socially active, so as to develop a socially aware and responsible personality prepared for active participation in society.
The goal of education is not just the transmission of knowledge but also the development of particular social values. In the Unitarian school the social conscience, rights and obligations and the concept of society and state would be part of the school life. The student would learn to adapt to this new perspective (Gramsci, 2005b).
The Unitarian school would participate in a changed notion of work and society. The unification of the vocational and the humanitarian school would stop the predictable outcome of producing managers and workers and play an organizational role in the social distribution of work. Each trainee in the Unitarian school would eventually be self-disciplined, autonomous and see themselves as bearer of universal social values. (Gramsci, 2005b)

## Discipline in the Unitarian school

Another main element of the Unitarian school is the development within each student of self-discipline. Gramsci gives a new meaning to the term discipline. Slackness has no place in the educational process (Lombardi, 1985). Intellectual work needs a kind of apprenticeship and instilling of discipline like any other. Gramsci (2005b) sets as a goal to build another type of education. He fully understands the difficulties of integrating a young child into in a learning environment, and that acquiring learning skills (e.g. to be diligent and have a certain frame of mind) requires repetitive action (Gramsci, 2005b). The new school needs to help each pupil to find his or her place and to understand that intellectual work, like any other, is tiring and demands, restrictions, perseverance and discipline to develop (Lombardi, 1985).

Discipline in Gramsci's term is different because it presupposes that the student will choose to participate in this (Lombardi, 1985). Gramsci promoted a new way for cultivating self-discipline in the Unitarian school. Coercion will fade away and the potential for activity, he suggested, will be promoted so that students decide themselves when to take action and gradually gain their autonomy (Lombardi, 1986). They will be a part of a programme that they will also design. This programme will include not only natural laws, but also social laws affecting people's life. As a result they will come to understand how work can become really productive and that work is also a means for participating and changing society (Gramsci, 2005). They will form the consciousness that they are part of a historical process and that they have the power to determine the social development. Beginning from school and from their region to wider things, they will learn how to organize, interact and fight for their rights. In Gramsci's view, historical reality is not something that people passively accept. Human beings are not objects, but subjects in the historical process. They are agents of a reality that they consciously form (Borg, 2002).

How might these ideas, that seem controversial with our current education system and philosophy, apply today?

We can use Peter McLaren's definition on critical pedagogy

> It provides historical, cultural, political, and ethical direction for those in education who still dare to hope. Irrevocably committed to the side of the oppressed, critical pedagogy is as revolutionary as the earlier view of the authors of the Declaration of Independence: is history is fundamentally open to change, liberation is an authentic goal, and a radically different world can be brought into being.
>
> (McLaren, 1989 p.160)

Critical education involves questioning the main role of the educational system. Critical educators don't struggle just for the "cooperation-learning" in classrooms. They participate in social movements against any kind of oppression. They act against the ideological and institutional processes and forms that reproduce oppressive conditions (Apple, 2009, p.3). The idea of students being part of a collectivity is very important. Gramsci suggests recognising schooling as one of the processes that formulates one's personality. So he suggests using it to an emancipatory direction. His goal is to form participants for the transformation of society. Gramsci's work is directed in helping the class struggle of his time. The social formation in Italy set a specific field for the counter- hegemonic action of every social movement so his propositions include a way of organising peasants and workers of his time. So if our goal today is to help the subaltern students to become emancipated from the dominant ideology and to become organised to change the relations that reproduce their oppression, we have to make them part of a group, so in this condition they must learn "discipline". This project is related to the social impact of knowledge and action so our critical means of learning must give to the students a thesis to what Gramsci called the collective person and collective consciousness. Revolutionary pedagogy as McLaren (1998) explains, uses the Marxists tools to make a proposition for action in our days. We need to make clear that Gramsci's proposition provides useful tools for today's social struggle.

## Spontaneity and participation in the Unitarian school

The Gentile reforms entailed a two-tier system of education, consisting of grammar and vocational schools. Gramsci felt that these reforms would lead to the perpetuation and dominance of class division. The vocational schools were determining the children's of the working class future at such an early age, considering them "incubators" of "small monsters" programmed for a specific occupation (Borg, 2002). In this way the working class members remained in their social location without having access to the kind of knowledge and baggage which would enable them to move in from the margins of political life (Borg, 2002). In this field, Gramsci is opposed to traditional education of his time that believed that a child's spontaneity should be allowed to be freely expressed with no restrictions, supposedly to allow his or her pre-existing personality to surface. He recognized that education leads to the reproduction of social division of labour. This situation at Gramsci's time was mainly justified by the "mismatch" of the children of the working class in the educational system. Children of the working class weren't used in mechanistic learning and didn't have the means for supporting humanistic studies. So the "personality" that they expressed was more suitable for vocational school. In Gramsci's view, children can develop any kind of personality, on condition that their spontaneity is guided, in order to produce a vivid imagination and originality. Children's pure spontaneity is very difficult to identify apart from behavior that is

triggered from its social environment. This means that careful intervention in the formation of its personality is essential. Gramsci, at this point, argues that the educator participates not only as a person, but also as a carrier of the chosen elements that one social group wants to pass on to the next generation, so teachers can choose which side they support, the oppressed or the dominants.

Meaning is very important to discuss history in the classroom, in order that students can understand the social process through it (Gramsci 2005b; Lombardi, 1986). The active discussion and the linkage of historical events can give a clear image of the continuous social and class struggles that form history.

So children are encouraged to express themselves and learn as part of a team. Children as active participants become independent. A child's personality is a process coming to light through gradual and continuous development that does not already pre-exist in his/her nature (Gramsci, 2005b; Lombardi, 1986).

**Teachers in the Unitarian school**

Gramsci thinks that teachers shouldn't be just intermediates between society and the student's personality, but they also need to be representatives of the collective critical consciousness. Teachers have to play an active part in the formation of the student's personality and be instructors, when there is a difference between the expression of the society and the student's beliefs. They have to smooth out the differences and draw the students to accept a different type of culture which is accepted across society. Here, Gramsci declares that there are general "educative" relations in society between intellectuals and non-intellectuals, managers and non-managers etc. (Gramsci, 2005b, 1973; Lombardi, 1986). Every kind of "apprenticeship" in society is an "educational" process that presents a specific method and rules and asks from the trainee to accept and use them. Gramsci's goal is to expand the fundamental values of the Unitarian school in these relations in society. So every "teacher" will have the same principles and will form the same relations with his/her trainees.

**The new culture in the Unitarian school**

In the Unitarian school knowledge would not just cover facts, dates and skills but it would embrace a whole new way of thinking and acting. Knowledge would be a process of self-discipline involving studying and acting in society, because everyone would have the sense of its role in the development of history.

This new culture will gradually erase the intellectual "experts" who help maintain ruling class hegemony in society. The aim is to demolish the distinction between "the man of action" and "the man of thinking", and to contribute towards equipping the working class to lead (Gramsci, 2005b, 1973; Lombardi, 1986)

*Gramsci's criticism up to date after 100 years*

A hundred years ago, Antonio Gramsci criticised the educational system and the conservative educational reform of Gentile. Today his basic points are still hugely relevant. The separation into classical (humanistic) and technical studies still exists in contemporary educational systems. Moreover, student performance still remains

indirectly connected to class origin. The middle and upper class students are over represented in universities and working class students represented primarily in vocational and technical education. As a result, the reproduction of the class divide persists which leads in turn to different employment outlets. The curriculum often remains formalistic and fails to promote critical thinking or social activity. Knowledge learnt at school is not properly assessed in the classroom and is presented as neutral, with no tendency to have a connection between scholar life and society. On the other hand, skills instead of knowledge are promoted in order to produce a "work force" with particular attitude and social perspectives. Through the educational process we have a constant production of labour power more suited to the interests of Capital and the owners of capital, the capitalist class. (Hill, 2006)

So in this situation we can usefully use Gramsci's pointers towards critical thinking and towards a new teaching method. A teaching method that, within modern critical education considers the trainees also as trainers, as co-creators of their own curriculum and as active participants in the social process outside the school. Gramsci's points can be used to recognize the historical production of science and to insert the social impact in every decision. These are some of the goals of critical science education. As Hodson (2003) refers, we must support critical scientific literacy to help students be part of social and political movements. So everything the learners are taught can be evaluated also in terms of a social usefulness. That could lead to the learners' to strive towards liberation and to broader social change.

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