

# The Impact of Industrial Revolution Flows 4.0 on Competitiveness, Policy and Standards of Education Quality

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Education is not a concept composed of physical structures, but devices and systems that are built on psychological structures. Building education is not the same as building roads, bridges and buildings. Building education is building thinking, faith and conscience. Building education in the industrial revolution era 4.0 tends to prioritize logic and skills by ignoring conscience and faith. Education without educating conscience and faith is not actual education. The impact of the industrial revolution 4.0 on education, among others, is that many of the quality standards for education, policies and other programs are no longer relevant. Future learning will be laden with the use of digital technology that is easy, inexpensive and effective. Because of that, education management and learning process must be supported by competitive advantage, excellent service systems, spirit, unique abilities, ability to master data and information sources, continuous change and improvement, orientation to quality, satisfaction and trust. The learning process is directed at developing a quality culture, creative ideas and innovation ideas.

**Key words:** *Impact of the Current Industrial Revolution, Education.*

## Preliminary

Everything that is bound by time and space will definitely change, and every change always gives birth to something new. Humans and the environment always live with something new. Those who are able to follow something new have a chance to win the competition.

Changes in the world today are influenced by the increasingly strong developments in science and technology, modernization and industrialization. Related to that, all aspects of life whether social, cultural, economic, political, legal, security and education will develop well if

managed by taking into account the demands and changes in science and technology, modernization and industrialization. Educational institutions that have the opportunity to win the competition in the era of the industrial revolution as now are educational institutions that are managed by taking into account the current changes in science and technology, modernization and industrialization. Educational governance systems that only depend on policies, quality standards, and systems that are rigid and do not pay attention to demands for change and future challenges, will be out of date.

The fact that occurs in Indonesia is that education is always left behind by civilization, science and technology and modernization. What is the cause? Science and technology change every second, while education management still refers to old policies and national education standards as a result of the 2005 stipulation. Now times have changed, years have changed and challenges and needs have changed. Thus, educational processes and products will definitely be out of date. Ideally, teachers and educational institutions equip children with the knowledge and skills needed by them in an age where they are competing. At present, the knowledge learned by students is the knowledge and systems contained in the national curriculum and educational standards that are over 14 years old. For this reason, it is time for the government and the education community to review national education policies or standards that tend to be "crushed" by the times.

## Discussion

Competitiveness is essentially the potential and strength in a fast race to reach the finish line. Who gets to the finish line first, will win the competition. To be able to reach the finish line early requires readiness and a competitive advantage. Competitive advantage is the relative ability to learn, work and make decisions early, to be more qualified, more productive and more effective. Before others understand the flow of change, you have changed the pattern of business. Before someone else changes their mindset, you have innovated change. When other people are still looking for a way, you have arrived at your destination.

Noting the readiness of education in Indonesia in entering the era of the industrial revolution 4.0 will face a number of problems, including:

- a. Education tends to be used as a means of control and a means of controlling momentary interests both economic interests where education is used as a tool of work only and not as a tool of life. Education is also used as an instrument of security interests where freedom of thought and opinion are often sidelined for the sake of order.
- b. Education will be left behind by the development of science and technology, modernization and industrialization, because technology develops every second and every moment, while the management of education in Indonesia still refers to the national education standards (SNP) set in 2005. Educational management that does not pay

- attention to the demands or changes in science and technology will definitely be left behind by the demands era. Educational products for both teachers and students will not be able to compete well in the face of competition in the field.
- c. The enforcement of the principles of educational professionalism is hampered by the national education system which only focuses on administrative matters, bureaucracy and control of educational interests. Education in Indonesia has not been designed as a professional system even though lecturers are referred to as professional staff. Teachers and lecturers are required to work professionally even though all components of education, both infrastructure, budgeting systems, management, environment, policies and welfare have not been positioned and arranged professionally.
  - d. Education is more focused on efforts to increase the quantity of results rather than the quality of the process. Education has been reduced in meaning to teaching, and teaching has been narrowed down to a process of transferring knowledge, theory and skills which culminates in a test. So the highest peak of education is the ability to answer a number of questions in the exam. Therefore, training to improve teacher quality, increase the budget, facilities and infrastructure, and so on is a big step that is less effective. In the end the educational products are none other than numbers and diplomas which do not necessarily represent real competence in the field
  - e. New education was developed as a tool of work and not as a tool of life. Humans can work but cannot live smartly, with quality and dignity. This fact illustrates that education has been "manipulated" by the economic field. Officials and education managers should focus on the goal of national education not just to receive deposits from institutions. As a result, educational processes and products are partial to national education goals. As if the objectives of national education are only items of desire that are only displayed in decoration. The proof, which is respected by the government, teachers and the education community, is not a child of faith and piety, but a child who is able to answer a number of questions about religious studies. Also the government and society only prioritize those who are able to answer a number of questions in the exam compared to those who have real abilities but do not have a diploma.

### **Flow of Change and Future Purpose**

Everything that occupies space and time is bound by process law and balance law. Every process will give birth to changes and the changes will move towards a new balance. Humans, while maintaining their core principles and powers, must move to adjust to the new atmosphere and balance.

Change is sometimes predictable, but in general it is unpredictable, meaning that it cannot be predicted with certainty. Gibson considers that change is a series of meetings where one event may change, replace, destroy, or even have a deadly effect on events previous. While



the world is becoming more complex and interdependent, change becomes increasingly non-linear, discontinuous and cannot be predicted with certainty. Therefore, the future is much more different from the past, and even more different from what we expect. Linearity is a wrong way of looking at the world. Events in a life are not a series of interrelated events that occur one after the other, such as beads that are woven into a necklace.

The changes illustrated tend to trigger the growth of complexity in various fields of life, both the complexity of education, politics, economics, social culture, and law. Where are education policy and where are political policies; which are legal policies and which are security policies, which are economic policies and which are social policies? Such changes can obscure future studies that are very much needed for the results of setting vision and education programs effectively

The flow of change after reform tends to move towards freedom, openness, democratization and human rights. Whereas human attitudes, thoughts and behaviour tend to shift from rationalism to pragmatic-materialist, from productive to consumptive attitudes, from work society to instant society, from social activities and environments to individual activities and environments. The shift tends to be oriented only to world affairs, while the interests of the afterlife are increasingly ignored. Humans tend to be enslaved by their subjective lusts and interests. Logic thinking sometimes clashes with conscience and faith. The flow of change tends to encourage the birth of symptoms of value disorientation, social disharmony, disorder systems, and role and professional dysfunction.

Even so, it must be believed that nature, the environment and humans are subject to the law of equilibrium, where when the initial equilibrium is damaged by subjective interests of life, it will move slowly towards a new equilibrium. Everyone will force themselves to move toward a new balance by adjusting harmoniously in the midst of conflicting situations. Failure of humans in carrying out the tasks of life was originally caused by failure in carrying out the process of adaptation to the demands of change which consequently failed to create a new balance.

Fluctuation in these changes is essentially a result of the increasingly strong competition in life. The spirit of competition has given birth to effective, efficient and productive efforts, such as efforts to re-engineer, benchmarking, continuous improvement, quality production and low cost, and so on. But those efforts must be followed by sacrifice to create a new balance

## Quality and Competitiveness

Competition is a race to quickly reach the finish line. To get to that direction, everyone must have a competitive advantage that is the relative ability to learn and work earlier, be superior and more effective than others. Before others understand new theories, I have already practiced those theories. By the time other people get ready to move towards the office, I have arrived at the office. When other people are still mixing halal wealth with haram, I have been freed from performance and illegitimate property.

That competitiveness quickly reached the finish line. Competitiveness is a distinctive advantage that is loved, competitiveness is price, service, quality, and trust that are considered capable of meeting the demands of consumer needs, competitiveness is the right position. That spirit is reflected in the performance that never leaves and neglects work. The attitude that is always perfect to be the best and superior. competition is the spirit to win the market. The key, love the task, diligently and enjoy the work.

The initial step to build quality and competitiveness is a commitment to excellence and enthusiasm to free oneself from defects and laziness. So achievement and success are not expensive. What is expensive is the effort to free oneself from defects and laziness. Therefore, one of the keys to achievement is good intentions and the ability to start. Change the attitude "later" to the attitude "Do it immediately ..." do not just want to be the best, but do the best. If the gas pedal has been stepped on, then the hand brake must be revoked immediately.

The problem of competitiveness is currently influenced by several things below:

- a. There is a gap between the demands of market needs and the limitations of educational institutions in providing new study programs which are more needed by the community
- b. The accumulation of graduates in one particular type of expertise because the institution does not have a variety of study programs. As a result, the increasing number of unemployment figures.
- c. Competition in the lower middle class is generally focused on price competition. As a result, quality, trust and satisfaction receive less serious attention
- d. Government protection against state tertiary institutions is too strong so there is unhealthy and unbalanced competition. State higher education is fully guaranteed by the government, human resources, buildings and other learning facilities, budgets and financing. In addition, the government is made a "guarantor" institution. While private higher education is forced to look for funding sources, prospective students themselves, infrastructure, and other educational resources themselves. Bureaucracy which is complicated in obtaining permission to establish new educational institutions. Even though the evaluation system uses the same system and boring between PTN and PTS.

- The education implementation policy has made it more difficult for higher education leaders, especially the private sector, to compete with state higher education institutions, especially foreign ones. That treatment gave birth to new problems and gaps.
- e. The attention and interest of the public in PTN is seen as stronger than their attention in PTS, even though the quality of PTN and PTS is guaranteed by the same accreditation system. This condition among others complicates the competitiveness of PTS. Moreover, most PTS has limited educational resources.
  - f. New educational institutions, it is difficult to compete in a society that is already fanatical about educational institutions that have been trusted
  - g. Given the increasing number and variety of offers offered by educational institutions, while the purely educational participation rates tend to be stagnant, competition tends to increase.
  - h. For this reason, it is necessary to restructure the concepts and development of education in the future. Steps that need to be taken by educational institutions include:
    - i. Has a competitive advantage that is the relative ability to learn and work earlier, more effectively and superior to others.
    - j. Schools do not just sell facilities and teacher degrees, but already offer quality, satisfaction and trust, far more important than just selling facilities and graduate numbers. Quality is thought, performance and value added expertise. Quality is the price of goods and services divided by the number of expectations and sacrifices whose results must be greater than 1. That's the value of "perfect" quality.
    - k. Selling educational credentials, at least done by offering classes free of disabilities, stress free and complaints free. Trust is a guarantee of certainty to obtain quality service honestly and fairly. Trust is quality, good image, plus satisfaction
    - l. Establishment of goals and learning programs must be clear and measurable results. Evaluation instruments must be tightly controlled so that valid and reliable evaluation instruments are born.
    - m. To establish strategic steps, management carries out environmental analysis and market needs analysis. The results are formulated into a strategic program that prioritizes the principles of effectiveness, efficiency, productivity and accountability.
    - n. To build the spirit of the times, management must be sensitive to aspirations, demands for change and future challenges by updating data and information.
    - o. Decision makers must learn from failure and learn from the success of others. Do not give excessive value to yourself, and always appreciate any support, attitude, thoughts and work of others. No matter how small the support of others, or how bad the way people think should be politely appreciated.
    - p. Careful in taking advantage of opportunities and in mastering sources of information; agile in making changes and in building networks, and cooperation with outsiders, and always dissatisfied with the results obtained, so he works hard to develop new steps and strategies to correct various deficiencies.

- q. Have a unique and diverse advantages that are not owned by competitors, and have sensitivity to the direction of change that occurs in the regional, national and global environment
- r. Has a standard and quality assurance, and is built on good quality performance and culture.
- s. The working atmosphere in an educational institution environment must be full of passion, fun and challenging. Therefore, treat everyone as the most important and valuable person, because everyone's performance generally grows on honor and dignity

### **Era of the Industrial Revolution 4.0 and Education**

The technological revolution marked by the strengthening of the industrial revolution 4.0 in mainland Europe has changed the way of life of the world community. Mindset will shift from philosophical thinking to creativity of practical thinking, ways of working will shift from labour intensive to capital intensive based on sophisticated technology, individual strength has shifted to network strength, symbolic strength (certification and diploma) will shift to real ability, a measure of success life will shift to the size of the world's numbers and symbols, competition for life, whether economic competition, political, social culture, education and so on will shift from land competition to competition in cyberspace, the flow of linearity will be replaced by the flow of complexity.

The development of the industrial revolution in the view of Prof. Krugman starts from:

- a. The First Industrial Revolution (1750-1830), marked by efforts to replace human and animal power in production with the invention of steam engines and trains. It was developed to sustain the mechanization of the production system. By using mechanical power and other technical means, it can ease the use of human and animal power in the production process.
- b. The Second Industrial Revolution (1870-1900), in the context of the follow-up to the first stage of the industrial revolution, was marked by the invention of electricity, communication equipment, chemicals, and oil. At this stage, mass production patterns and concepts are developed.
- c. The Third Industrial Revolution (1960 - 20th century), marked by the invention of computers, the internet, and mobile phones. This technology was developed with the principle of automation in the process of production and industrialization.
- d. In the 21st century, the Fourth Industrial Revolution, or often referred to as the Industrial Revolution 4.0, was developed. Industrial Revolution 4.0 began to be marked by the strengthening of physics and microbiology and the integration of various aspects of life in digital patterns. On one hand this process provides added value in the digitalization process, but on the other hand cannibalization occurs in the fields of technology, industrialization and modernization. Changes that occur are not just replacing each other

but also leading to efforts to shut down one industry to another. Social life and respect for human values are weakening. Pragmatic, materialist and individualist schools are increasingly strong. Humans tend to ignore their dignity and identity. Humans live only with logic, skills and interests without regard to faith and conscience.

In this regard, the impact of the 4.0 industrial revolution on education was enormous, including:

- a. Learning will move from class to cyberspace, so that national education standards, especially education facilities and infrastructure standards become less relevant. Because maybe, someday the classroom will lose its function, because lectures through digital technology is a necessity. The rules about distance learning will be difficult to control. Also Teacher Ratio: Students Become Less Relevant again because a lecturer who teaches using sophisticated information technology can deliver material from one point in the studio to tens or even hundreds of points in other places throughout Indonesia and can even penetrate abroad. As a result, the relationship between lecturer and student is limited to academic administration - students will lose their humane affection and attention.
- b. In line with the strengthening of lectures through digital technology, the role of teachers and lecturers will be replaced by YouTube where learning via YouTube is far more interesting than conventional learning.
- c. Likewise with the library. Libraries that are bound by time and space will be replaced by the role of E-library which is far more complete, easy and interesting. This role can slowly kill the role of conventional libraries
- d. The educational process will shift from labour intensive to technology intensive. Thus, Educators & education personnel are at risk of losing their jobs.
- e. Vocational school graduates and applied science study programs that emphasize strengthening conventional technological skills, become irrelevant to be in the digital realm.
- f. The duties of the school supervisor will be replaced by the role of CCTV. Supervision through CCTV technology is much easier, effective and supervision is not face to face, but everything is controlled. Thus, the duties and functions of school supervisors will lose their role and work.
- g. In line with the increasingly strong development of science and technology, modernization and industrialization, the dynamics of life will not develop in the same direction and linearity, but will be multi-complex. Thus, linearity flow will one day be replaced by understanding complexity.
- h. Pornographic viruses, drugs, promiscuity have entered the children's bedrooms through the internal



- i. The World of Work will shift from labour intensive to high technology based capital, and the competency requirements of the workforce will also shift from symbolic strength (diploma, certificate, etc.) to real competence.
- j. The current of civilization shifted from philosophy-rationalist to pragmatic-materialist. For this reason, logic or mindset matters will be defeated by interests and practical advantages

### **Challenges for the World of Education**

In line with these problems, there is a possibility of education being left behind by the strengthening of the current industrial revolution 4.0. These impacts include:

- a. Education will be left behind by the development of science and technology, modernization and industrialization, because technology develops every second. While education is focused on the product SNP in 2005.
- b. Educational products are currently not designed as a system capable of producing competitive human beings with a vision of the future. Education is currently only able to equip people with a diploma. Though competition will develop at the level of professional competence.
- c. Education is used as a tool of work and not a tool of life. Humans can work but cannot live.
- d. Education is formed by the flow of rationalism which tends to place logic as the only power. Though humans live with identity.
- e. Education has been reduced in meaning to teaching. Teaching was reduced to the process of knowledge transfer. The climax is a test. So the peak of educational achievement is the ability to answer a number of questions.
- f. Development concepts are dominated by economic theory, so that the measure of success in education development is only measured by statistical figures.
- g. The measurement of the Human Development Index (HDI) damages and narrows the meaning of national education goals.
- h. SMK curriculum is directed to be adjusted to market needs, even though the market is sick. Individualist, materialist, pragmatic and hard to find honesty in the market.
- i. The world will shift from conventional society to high-tech digital society. While vocational education graduates (vocational, applied study programs) have just given birth to conventional knowledge graduates. It is probable that the number of unemployment will increase.

Thus, the future will be controlled by an instant rationalist-practical society in which practical efforts produce something of great effect. Humans have practical industry banks, but the education information services produced will develop wildly and beyond adequate control.

This will have an impact on the emergence of attitudes, thoughts and behavior of people who live without ethics and faith.

Changes in the world will develop in the direction of the revolutionary era of digital society, and change towards a knowledge society. The education community is required to understand and utilize information and communication technology (ICT Literacy Skills).

Education plays a very important and strategic role in building a knowledgeable society that is technology and media literate, has effective communication skills, is able to develop creative technology, likes to develop innovative ideas, and master data sources and information technology.

But it is realized that the education system in Indonesia has not been designed as a professional system (new teachers are referred to as professional staff); Educational products are still measured by numbers and diplomas; the pinnacle of education is the ability to answer a number of questions in an exam; The objectives of national education are partial to the curriculum, learning process and learning evaluation system; The aim of national education has not been supported by education management, the performance of teaching and educational staff, learning facilities and infrastructure, student learning culture, learning patterns and relevant learning evaluation systems. Moreover, education is only developed as a tool of work, not as a tool of life, whereas education is a tool of life and a tool that is responsible for life after life. Character education has shifted to the teaching of science about character

The challenges faced by the educational community include that the industrial revolution 4.0 demands the development of skills in understanding and utilizing information and communication technology (ICT Literacy Skills). While Indonesian people's reading culture is low, creative ideas have not developed well and innovation ideas are still limited. However, the atmosphere of learning in the digital age will make it easy for teachers and students to find various concepts, science, and technology through the digital world. Learning patterns are not only limited by the classroom but can be developed in cyberspace. Learning patterns can be done efficiently and effectively.

Related to that, education management and learning process must give birth to a society of technology literacy with multiple intelligences, building a culture of achievement. improve the quality of thinking, develop creative ideas and innovative ideas, and develop the spirit to be the best in various ways. Learning must also be directed at efforts to free students from laziness, ignorance, backwardness, fear, self-confidence, as well as from bad attitudes, thoughts and behaviour. Also, education must be directed to prepare for a child's future that is better, smart, quality, dignified and useful.



## **Conclusion**

Education governance which is considered successful in the past may not necessarily produce the same quality in the present because the climate and the necessities of life of the people changes, also science and technology change every second. If education policies, including national education curricula and standards and education management systems are not adjusted to the demands of change and future challenges, education will be left behind and no longer be relevant to the demands of the market. In other words, the success of education in the past will be a source of failure in the future if the resources, systems and strategies do not change.

The function and role of education at this time is influenced by the increasingly strong changes in science and technology, modernization and industrialization that are developing very rapidly, unpredictable, irregular, interdependent, mutually influencing one component to another. Therefore, the management system must be adapted to the demands, needs, and the flow of change and future challenges.



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