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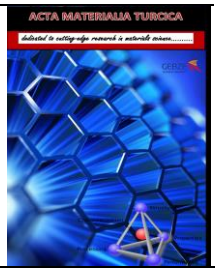

The Key to Prosperity for the Development of Prosthetic Technology Through Micro-Nanotechnology

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Abstract:

Each era has its own technology and is called modern technology. Technology was created to serve humanity in all aspects, the malfunctions facing people are unlimited and must be resolved in an appropriate manner. Prosthetics are parts of the artificial body, which are of interest to scientists in biomedical engineering. Hence, the performance, size and cost of prosthetics should be affordable to everyone; they are very important and should always be taken into consideration. Consequently, the only way to get the prosthesis and the other artificial intelligence appropriately is to arm the academic institutes with Micro/Nanotechnology. The modern technology of this generation is questionable, whether it is spread globally or is limited and confined within its borders. Using technology is one thing, reproducing it, and contributing to the development of technology infrastructure is another. In terms of technology, society is divided into two categories, while the first layer is nothing but consumer societies, and the other is creative and innovative. The technological gap between the productive society and the consuming societies widens and the hole deepens, and thus the consuming societies lag behind the developed society, which is why this country is called the developing countries. Education and technology must interact to improve outcomes that have a direct impact on societal prosperity.

K**eywords:** Modern Technology; Developing Countries; Education; Societal Prosperity; Prosthesis.

DOI:

1. INTRODUCTION

Since 1832 the first computer was invented and discovered, and this technology was great and innovative. Life did not stop there, on the contrary, it continued until 1946, when the first electronic computer was built, and an amazing new step in technology was born, and this technology was built on the basis of a vacuum tube, which was invented in 1904, and this was a modern technology at that time, as shown in Fig. 1, this technique was mostly a miniature style of modern tubes.

In 1947, the bipolar transistor (BJT) relied on semiconductor materials, type n and p, as a solid-state device. This remarkable technology has made electronic devices compared to vacuum tubes technology smaller, more efficient, more reliable, more durable and cheaper. In 1958, a new generation of technology was born, represented by the first integrated circuit (IC), which was based on solid-state devices, and with this revolution, vacuum tube technology was outdated and began to disappear from the construction of electronic devices, until it disappeared in the 21st century.

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Figure 1. Vacuum Tubes.

In 1965, Gordon Moore observed that the number of transistors on a chip doubled every 18 to 24 months, and this theory remains in question. Fig. 2 shows the simplified version of Moore's Law. Is that correct? In 1971, Intel inserted impressive IC technology in modern computer engineering by making the 4004 microprocessors, which allowed technology to advance faster and faster, breaking the Gordon Moore Law, drafted in 1965. In 2000, Intel Pentium 4 Microprocessor, and in 2008 Intel Core 2 Quad. Recently, technology has reached around 5-7 nm, which is a large number of transistors in a very small area, high performance, cheap and reliable.

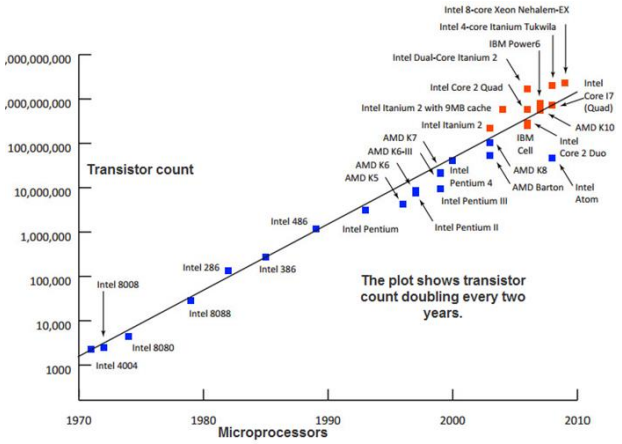

Figure 1. A microprocessor Transistors counts 1970-2011 & Moore's law. **Hata! Başvuru kaynağı bulunamadı.**.

Moore's Law has a serious flaw, while it only takes into account the number of transistors on a chip, it does not deal with other critical factors that are essential, which are pillars in the development of integrated circuits. Speaking of it, the more transistors on a chip, the more accurate the IC is obtained, not so far true. From the scientific literature, Fig. 3 shows a diagram of the CPU properties versus the number of transistors, single-thread performance, frequency, typical power, and base numbers; line corresponds to exponential growth with the number of transistors doubling every two years. In terms of processor clock speed, which is the second major parameter in technology to be considered, the speed has been clearly improved from 1970 to 2010, as shown in Fig. 3. Other crucial parameters like performance and power consumption don't deal with the transistor number either. Thus, the behavior of the parameters appears strange and does not follow the known prediction, where the behavior of the parameters curve is, as shown in the Fig. 3, Leaned sharply and somehow flat, which certainly indicates that Moore's Law has reached its limit and is no longer applicable.

The highest level of technology describes in detail what happened. From 90 nanometers and less, it has become imperative that transistors leak part of their energy into the processor substrate. When this happens the chip heats up rapidly as the area of the die is so tiny. The more transistors on a chip, the more leakage power, and the higher the temperature. It seems that the technology revolution comes to a grinding halt. Before 2004, chip development was very fast: the 1 GHz P3 clock speed is 125 x higher than the 8086 processor, but power use is only 18 times higher. Between 1994 and 1998, the processor clock speed increased by 300%. But between 2007 and 2011, the increase was only 33%. The processors hit a hard and solid wall.

Technology limits are restricted to atomic particles so they cannot continue to design after that. If the size of the last transistor reaches these limits, the million-dollar question is: What then? The answer is simply quantum computer. Another question that arises after the quantum era is: Then what?! Thus, the industry will cope with this change and start a new era of technology. Therefore, the exponential growth of the transistor is not proportional to the superior exponential performance of the integrated circuit. This is a serious challenge in various areas, especially in communications, while G4 has not reached the speed limit and started talking about G5, as G4 still suffers from many unresolved issues as mentioned above. Therefore, more studies and research should be devoted to solving this challenge.

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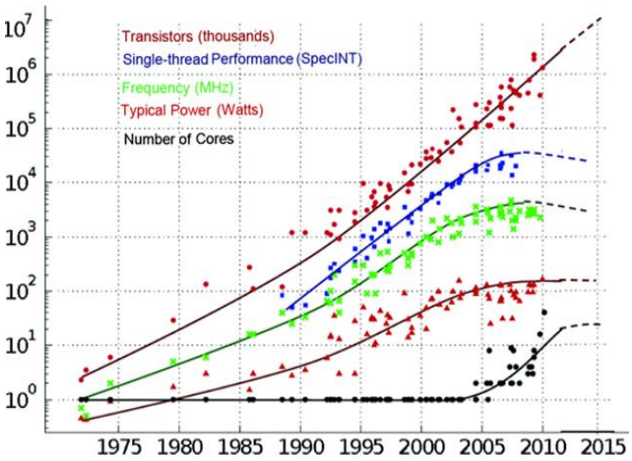

Figure 3. 35-Years of Microprocessor Trend Data based on original data up to the year 2010 collected and plotted by M. Horowitz, F. Labonte, O. Shacham, K. Olukotun, L. Hammond, and C. Batten New plot and data collected for 2010-2015 by K. Rupp

In 1974, Dennard Scale was published and announced that other CMOS technology parameters such as oxide thickness and transistor length could be combined with a constant factor. Therefore, the number of transistors has been preserved to be the main role of technology control, which is why it is also known as the MOSFET scale, and unfortunately, the Dennard scale did not last much and soon disappeared in 2004, and this gave Moore's Law the ability to be dominant and still. Several developments in CMOS technology emerged between 1990 and mid-2000, including but not limited to, using excessive expansion and pipelines to improve processor efficiency, and inventing off-system implementation. Therefore, this period was recently known as the golden age of scaling. As a result, this will keep Moore's law in effect until the middle of the first decade of the current century, as energy consumption and clock speed improvements have collapsed.

The problem at 90 nm was that the transistor gates became so thin that the current did not leak into the substrate. In 2004, the death of CPU scaling [2] was announced, when Intel technology replaced a new multi-core architecture that eliminated Tejas. Fig. 3. shows the number of transistors, hour speeds, power consumption and parallel at the instruction level (ILP). Doubling the transistor every two years is known as Moore's Law, but over time, assumptions about performance and energy consumption have also been made and have been shown to advance along similar lines. Moore got all the credit, but he was not the only one with a vision in action.

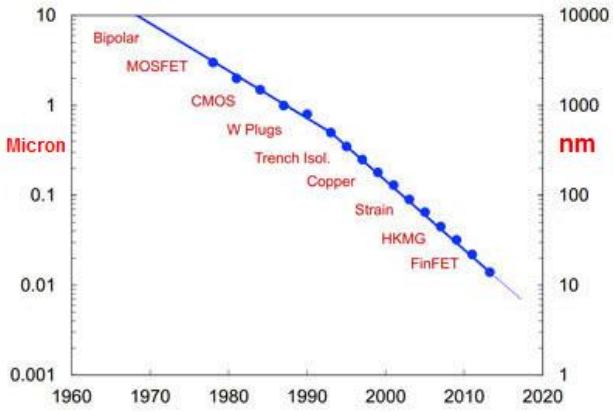

Figure 4. (EPI) Moore's law Challenges Below 10 nm Technology, Design and Economic. Process/device innovation has always been an indispensable part of scaling (Intel) [3].

Fig. 4 clearly shows the rapid growth of technology, and there is no doubt that one should not take a nap if he wants to continue to follow the technology and its trends. So, what if the educators and followers navigate the opposite flow of technology, they certainly have lost their compass. Engineering programs in developing countries have not exceeded the bipolar level and, at most, little of the MOSFET level, education is just abstract theories, no spirit in their education. These institutes have never taught technology the right way. Teaching in academic institutions depends on indoctrination. What do you expect from what is really expected?! The results of this process, based on this teaching philosophy, are nothing more than nothing, and reality confirms this fact. The teaching process must be pragmatic.

2.PHILOSOPHY, EDUCATION and PRAGMATISM

Many thinkers and philosophers have discussed definitions and principles and have stated their opinions clearly. Below are some of their opinions from literature to clarify the point of backwardness that led to the classification of universality into two categories: developed and developing countries. The philosophy of education can refer either to the academic field of applied philosophy or to any of the educational philosophies that promote a specific type or vision of education that studies the definition, goals, and meaning of education.

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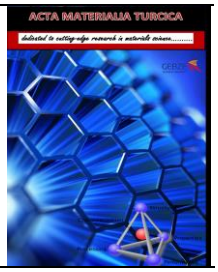

Educational philosophy clarifies the concept and analysis of assumptions, beliefs and theories of education [4]. Education and philosophy are closely related. Philosophy is the love of knowledge and education is the acquisition of knowledge. Philosophy is the cornerstone of education. Education is a practical activity of philosophical thought. Without philosophy, education would be a blind effort, and without education, philosophy would be disrupted. Philosophy answers thousands of questions related to the entire field of education [5]. A philosophical vision is necessary to understand new trends in educational systems, especially contemporary educational movements [6]. According to the definition, education must have a comprehensive definition. Education is the development of the individual according to his needs and the requirements of society, and it is an integral part of it [7, 8].

Technology interferes in all aspects of our daily life, and this is a new type of slavery, and modern humanity has become followers and consumers of the latest preparations. In this regard, technology has become the king and the human being a slave. Therefore, waking up is required to control the control wheel and humiliate technology to properly serve people, and to make technology the flower of life, not end productivity. This is how technology changed education. [9] Technology has deep impact on each pillar in human daily life, the change is manifestly dramatically has been occurred over the past decades, and still. based on this change; the world and a lot of values are changed rapidly. As inventor and developer of technology; technology has been expected to change our life to its best, but this is not always the case, because the innovative technology is changing our lives every second, and this change may affect human life either positively or negatively. Therefore, a dynamic outlook and mental flexibility are strongly required to have an all-round adjustment and optimal development. [5, 9] There is no philosophy that contributes to all aspects of education. Idealism is built on spirituality. Physical basis. Pragmatism is between the two concepts. While idealism is famous for its noble and evolving goals in education, pragmatism is well known for its brilliant principles, methods, and methods of teaching style. There is no perfect philosophy to offer everything. But we want a complete education for a full life. If we combine all good ideas and principles with the best materials for all of these philosophies, we must adopt a selective approach by coordinating conflicting ideologies and merging them together. We have to find unity in differences through a selective approach. [10] Reality is based on two characterizations where there is no contiguity between idealism and materialism, therefore, a huge struggle occurs between them. Pragmatism is considered as a crucial school of philosophy of education system has come to compromise between idealism and materialism, which is considered as a positive implication of pragmatism in educational system [11-13].

In light of the definitions of philosophy, pragmatism and education above. Literature and educational technology and its directions require a specific strategic plan and educational philosophy, in which theory and practice must deal with each other as one unit, and thus, this methodology undoubtedly leads to an innovative and innovative generation. After that, this institute will be instrumental in achieving prosperity for its community. Since the academic institute is a small community, it is its duty to make the education process a tool for developing social skills that will definitely foster societal prosperity.

3. WHY ALL OF THIS ABOUT TECHNOLOGY?

As already mentioned, the technological ability enhances itself and everything in the daily life of man adapts to the latest technologies, and technology has a profound impact on every pillar in society and this is only education; research and development in academic institutions. Therefore, for the most recent modern teaching of the academic institute, this would allow society to flourish, narrow the gap between developed and developing countries, and reduce the depth of the education hole in society.

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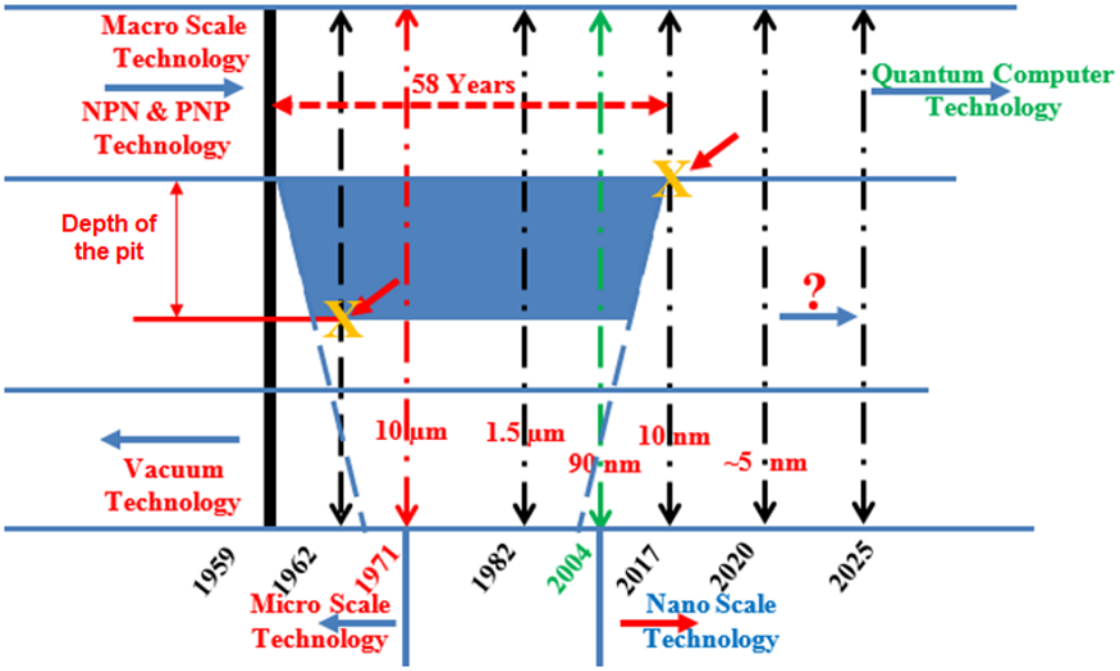

Fig. 2. The gap and depth of the pit between developed and developing countries.

Fig. 5 shows the gap between domestic and international institutes in the light of applied technology. Moreover, the depth of the pit in which the local institute itself is buried appears, because technology is not applied in the right way and has a strategy of extra publicity, which is worthless, but it wastes time, money, and efforts. The result of this process is clearly the production of students without real knowledge that can properly serve themselves and sectors of society.

4. HOW FAR DEVELOPING COUNTRY FROM TECHNOLOGY?

Based on the reality of technology, and considering the current state of educational achievement, which is ultimately a rudimentary education, it is simple mathematics which is about six decades away from applying modern technology in a correct way in daily life. Why the shock? Fig. 6 is a schematic diagram that shows how far a developing country is from modern technology, while the ceiling of technology taught in its institutes is outdated or about to be outdated. On the other hand, developed countries are moving rapidly towards quantitative technology. What does one expect to achieve from such academic institute? What development does one expect? Million Dollar Question; Why did this happen? For simplicity, the education process requires a revolution to direct knowledge in the right direction, and there are many factors in such a society that make the situation very optimistic, and the nation has capable scientists and has the positive energy needed to shoulder this responsibility and highlight it.

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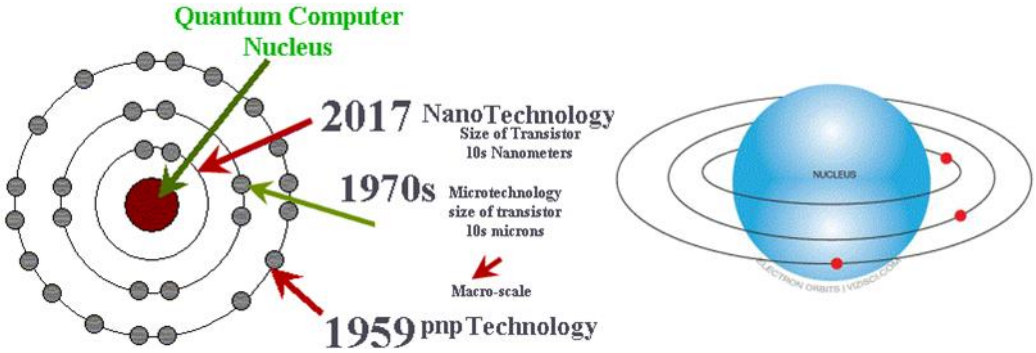

Fig. 6. Sketching demonstrating the why we were not existed on roadmap of technology, where we are there.

There is nothing to prevent a successful exchange of knowledge. Besides, it is worth noting locally that there is already a public sector that undertakes many initiatives to direct their energy in the right direction and to highlight the culture that has encouraged and continuously promoted the estimated exchange of knowledge [14].

5. DOMESTIC TEACHING OF ENGINEERING and REALITY

Our expert eye told us that engineering at the local level was and still is far from the latest technology. Fig. 7 shows the table showing why local academic institutes are not on the vast global education map as shown in Fig. 8; but also, from available technology. The technology created in 1959, and that was not taught or applied locally the right way. Therefore, the main reason why such a society is considered a developing country is the policy of systematic ignorance that applies to the nation.

Moreover, if a deep look is taken in this table, it is easy to know that higher local institutional education teaches the history of technology and not modern technology, besides the practical part does not exist. Therefore, engineering education is not applied exclusively correctly; locally. It is about six decades away from this reality. That is 1959. The situation is still controllable and extraditable, as local national competencies are available and able to catch up with technology. Hence, moving away from modern technology should not be considered an obstacle. On the contrary, motivated educated people should be motivated to stimulate their knowledge and serve their community as expected. The thing here is what do you want? Do you have the will to start with passion and active determination?

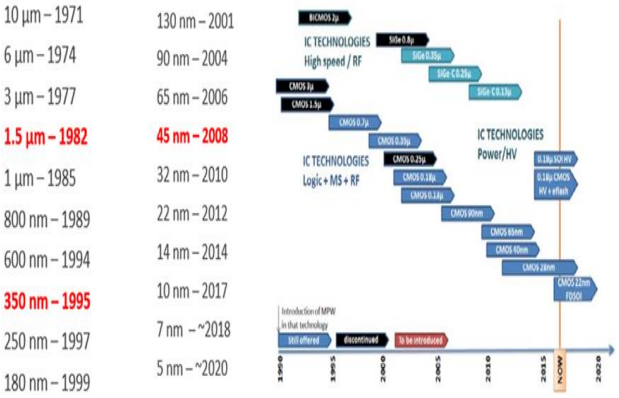

Figure 7. The progress of technology from 1990-2017, the black refers to expired technology. [Europractice annual report for 2016].

Fig. 8 shows countries around the world that have rhythm tools in 2015, and Fig. 9 shows the global map for 2016, where countries have high-tech programs; rhythm tools, which are used in integrated circuit design (IC). The distribution shows the great difference between two-year countries, 2015-2016, because these countries has realized the importance of this technology in higher academic institutions, and during the two years it does not show a tangible presence for local countries. Fig. 8 shows that the introduction and application of the latest technology is possible and applicable.

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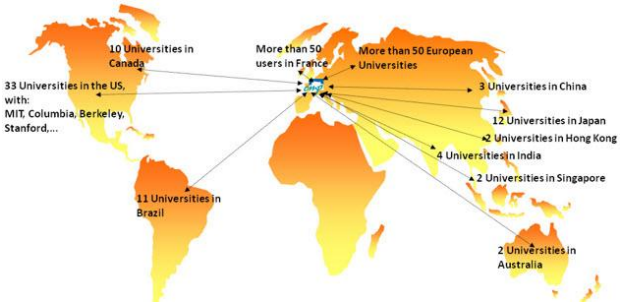

Figure 8. The wide world education's map, whereas the high domestic institutional education is nonexistent. From Europractice annual report for 2015.

Frankly, in 1996, the technology that local scientists made in a foreign country was 1.5 meters per meter, in fact; the technology available was 350 nanometers; in 2007, the technology that local scientists used was 350 nanometers, in fact; the latest technology was 65 Nanometers and up to 45 nanometers, which were achieved by 2008. Nobody blames external resources, but we must blame ourselves. Do we understand the point? All factors that help improve local life are available. The only thing missing is the "will to change" "nothing more, nothing less."

6. WHY MODERN TECHNOLOGY and INTEGRATED CIRCUITS (IC)?

Why CMOS? This question is negotiable, and its answer is at stake. Considering this fact, the answer comes from two points of view, one of which is due to the fact that daily life works on the basis of using technology, the highest technology available, the great life that you will have. The other is highlighted by the fact that says: If you do not create your own technology yourself, you will never be capable to make your own decision. Slavery can be in many different ways, just because consumers are one of the worst.

Figure 9. Domestically; a few of the high institutions' education have become existent on the wide world education's map and demonstrate the difference between 2015 and 2016. From Europractice annual report for 2016.

7. DOMESTICALLY; IS EDUCATION HEALTHY?

The quality of education is mainly measured by the Institute's results; therefore, education does not look good, and this conclusion is based on rankings and results published locally, regionally, and internationally. Speaking of the problem that has already been identified, the solution must therefore be taken seriously, otherwise, education will still suffer from its illness. In the end, the education cannot bear such weakness, so it will be destroyed, accordingly. By definition, an informant; whistleblower, is a person who discloses any kind of information or activity that is illegal, immoral, or incorrect within a private or public organization. There are many factors that reinforce the corruption of the education issue, but due to the lack of a policy to report violations in many countries, the situation is getting worse and difficult to make unclear or clear. Basically, the education situation looks bad because there is no will to change fundamentally, even it is not crossing the mind of decision-makers, it may be due to laziness or ignorance, and they may be both at the same time, making the situation worse. Therefore, the difficulty of accepting change will surely lead to the profound level of developing countries, and therefore, the culture of change must exist

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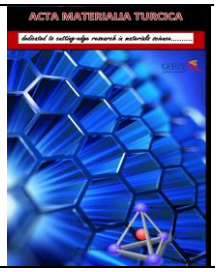

strongly. Otherwise, just thinking about change becomes frightening, so, fear replaces courage.

The call to develop and modify the educational process is only a strategy for hustle and bustle, as it never approaches the field of modern technology. Besides, they never follow the process and notice the place of weakness and strength. The situation has not changed and there has been no progress in the education process. On the contrary, instead of devoting some effort by adjusting and developing this agenda and criticizing its weakness for its failure, it was honored instead of eulogy. Any professional and successful system must have the discipline and criteria to achieve its goal, monitor and evaluate it, to see how close this team is or to conform to the minimum system requirements. Then the principles of requital and punishment should be applied accordingly.

Knowledge is crucial, and therefore a measure, while decision makers in developing countries represent the head of knowledge in their field, or are supposed to be structurally at the top of the pyramid; and because the results of the educational process are at a low level, their qualifications and knowledge are questionable, and this can be seen clearly through their scientific achievements. Ethically speaking, people themselves determine their level, and therefore must give others their values and levels to modify the entire educational process correctly. Unfortunately; this is not the case, it appears that this is the nature of the human person and therefore, standards and regulations have been established to ensure justice between individuals. Domestically, professionalism is alien to this society, and therefore no one should expect the unexpected. Thus, the brain drain phenomenon does not arise out of nothing. Scientists are smart enough to realize the influence of a weak leader on them by reducing and neutralizing their capabilities. Thus, as smart people, they prefer to leave rather than inhibited.

8. THE AMBIGUITY OF THE EDUCATION STATUS

Many people ask about education and what happened to it. The educational mode appears to be in order. This is not the case, as it is always referred to in 1995 as a starting point for curvature. This is not at all true, because education during that period taught only theories of abstraction, which were invented two decades ago: 1995-1959. Thus, it sounds good, because the theories taught at the time seemed closer to technology in the 1950s, but certainly were not good at all, besides the teaching process was not adapted to modern technology; 1990-1995, as shown in Fig. 7 The teaching process was not practical. Therefore, the situation is still far from the reality of knowledge that does not lead to the progress or prosperity of societal sectors. Unfortunately, local scholars are involved in carrying out a foreign agenda, and others are recruiting themselves to defend such a miserable situation, whether they know or not know, but there is still a bad situation, and there are no acceptable excuses, because the result from the academic process does not require much intelligence to be discovered, which is evident to people from both the public and private sectors. Campbell Bannerman Conference, 1905-1907, [15] the outcome of this conference was a catastrophe and the generation of this nation began to pay off. The document that highlighted conference recommendations state by: "In the Middle East people have the same religion, the same language, we have to divide them, and we should never allow them access to science and technology." [16].

To keep the people of this region disintegrated in their late ignorance, and on this basis, they divided the countries of the world as they are known into three categories, the third item of the document became tangible recently and clearly visible. The third category: states: “Countries that do not fall within the Western Christian civilization and there is a civilizational clash with it and a threat to its superiority. They are Arab countries in particular and Islamic in general, and the duty of these countries is to deny them support and acquire knowledge and technical knowledge and lack of support in this Domain and fight any trend of these countries possesses technical sciences [16].

9. CONCLUSION

At the local level, the education mechanism strongly requires a revolution to be properly rebuilt, to provide society with its needs in various aspects and sectors. The current mechanism relies on abstract theories, which are often outdated and disappeared, and are neither pragmatic nor adapted to the latest available technologies. Therefore, the results and achievements of these academic institutions are unreliable and of no value. Meanwhile, the efforts and money spent throughout the study period are nothing but waste and squandering. Thus, investment in education became waste and extravagance.

The treatment of this mechanism of its troubles and disease is to take advantage of accurate nanotechnology and apply it in the right way, and it is certainly the key that will broaden the horizon of research and scientists, in

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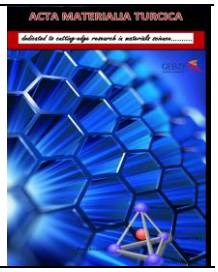

particular; in biomedical engineering, and thus, makes the door widens to enter and extend all success and prosperity in society. Depending on the learners' honesty and knowledge, the higher the level of knowledge obtained, the greater the progress of society.

At the same time, there can be no invention and innovation in this academic environment, and therefore, research and development will be limited to the conditions available. The available technology will neither serve humanity nor match its needs. Therefore, such a society will always depend on others and will never be independent and can only be developing countries in the best conditions.

The development and research of prosthetics and other human organs, i.e. artificial kidneys and pancreas, is a technical basis. Depends on size, weight, cost, performance, and reliability. Therefore, having them appropriately requires technology to produce compact and tiny devices; CMOS/MEMS technology, whose characteristics and behaviors match the expectations level. Availability is something to deal with, but the will to change is questionable.

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