

THE DEFICIENCIES OF INDUSTRIAL EDUCATION AND ITS CONTEMPORARY CHALLENGES

Guram Jolia

Professor at Technical University of Georgia

E-mail: g.jolia@gtu.ge

ABSTRACT

The article explores the dual nature of humans, being both the strongest and the weakest creatures on Earth. It discusses the resilience of the human intellect and how it has contributed to the development of mankind through the power of the mind. However, the simultaneous existence of immoral and aggressive instincts poses challenges to the harmonious coexistence of individuals. The article emphasizes that education is the key to addressing (even partially) these challenges.

Given the unique nature of education, it cannot be inherited, bought, gifted, appropriated, or forced. Education is a self-acquired phenomenon. Furthermore, acquired education (knowledge) is a very specific commodity, as it is a very “perishable” and permanently renewable intellectual capital.

The article delves into the intricacies of the educational process, drawing insights from renowned thinkers, including Pythagoras and Plato. It discusses the causes and factors of the global crisis in education, as well as challenges, paradoxes, and emerging trends in the educational system.

The recent requirements of education, the genesis and present demands of the continuous education system, the shortcomings and new challenges of the educational system of industrial society, digital literacy (competencies, skills), and the modernization of education are further discussed.

Objective: Primarily, the article aims to reveal the role and significance of education in human development and, specifically, to address the challenges in the industrial education system and the imperative for the modernization of education.

Research Methods: The study employs scholarly abstraction, analysis, synthesis, induction, deduction, and historical-logical research methods.

Keywords: Information technologies, paradox, crisis, pillar, internet, competency, innovation, genesis.

INTRODUCTION

The 21st century is marked by a profound transformation in education, and this is entirely intrinsic, manifested particularly in the innovative development of the country closely tied to education.

In the era of post-industrial development, characterized by the paradigm of “Industry 4.0,” novel educational initiatives are emerging on the forefront. Traditional methods of learning have undergone a transformation, necessitated by the demands of the contemporary age, prompting a fundamental reconfiguration.

However, the transformation of the traditional education system has become a challenging task, as it is influenced by various factors such as the influx of new pedagogical personnel, substantial financial resources, and the introduction of innovative teaching methods. Moreover, it is intricately connected with the alteration of the mental framework of individuals, which poses a considerably complex undertaking.

MAIN TEXT

Human is inherently the most powerful and the most delicate creature on Earth. Its strength lies in intelligence, while its weakness in loneliness. Both of these attributes significantly contribute to comprehensive development within the realm of education.

It is through the application and development of reason and mind that many significant milestones have been achieved in the history of human coexistence: the creation of new tools and opportunities for advancement in labor and mobility, harnessing new sources of energy, and developing alternative resources. Additionally, formulating cultural and educational norms, advancing knowledge and culture, instigating intellectual revolutions, restructuring infrastructure, establishing regulations for cooperation and sustainable development, and many other accomplishments.

In human life, there have been numerous opposing factions. Regrettably, their negative actions and thoughts have consistently deviated from the principles of civilized coexistence throughout history. This is because human reasoning and behavior, fundamentally oriented towards prioritizing someone or something through various methods, have been predominantly guided by subjective assessments and inclinations.

Generally, humans are the most aggressive creatures on Earth, as affirmed by their action: wars marked by bloodshed, relentless acts of violence against one another, widespread poverty, and myriad forms of adversity.

“There is no limit to human immorality” [1; 47]. However, the Bible warns us: *“... for from within, out of the heart of men, proceed evil thoughts”* [2; 8:21]. Nevertheless, within Christianity, there has also been a significant emphasis on violence (e.g., the Inquisition, “Night of the Bartholomew”...), forgery (e.g., indulgences), and a relentless struggle for power.

The main reason for the immoral thoughts and harmful actions of humans is the deficiency in education and ethical culture. Therefore, it can be argued that the improvement of human behavior, even partially, is achievable primarily through education.

As noted, humans possess a second attribute – a weakness. Here, education plays a crucial role, as through education, every individual within our society becomes a member of the community, enabling civil communication. Educated individuals, in addition to their intellectual knowledge, often exhibit more just and peaceful relationships with others. Socializing with such individuals is simpler, contributing significantly to societal integration.

Education should cultivate a person to be a good-natured individual. **However, even an educated person may exhibit tendencies towards harmful actions and unethical behaviors.** Therefore, education is not an absolute safeguard against all our vulnerabilities.

The renowned German philosopher, **Immanuel Kant**, considered education as the primary criterion for considering humans as human beings: *“We become human only through education”* [3; 19] and perceived that *“education is the exit of man from his self-imposed immaturity, which he himself lacks. Immaturity is the inability to use one’s own judgment without the guidance of others”* [4].

An uneducated individual cannot create a developed society!

A human is not intelligent by birth. Similar to animals, they often act on instincts. However, unlike them, a human, born into a neglectful socio-educational system, develops differently. Therefore, throughout the years, they are dependent on others and require guidance from them. Consequently, they tend to be more adaptable and responsive to intellectual development and socialization. It is noteworthy that their mental and social advancement occurs at a faster pace. Therefore, their upbringing, where education and culture play a crucial role, holds great social significance.

The nature of education (knowledge) is unique: it neither diminishes with use, nor can it be bought, consumed, or transferred to another by force. Education is inherently a self-renewing phenomenon. In addition, acquired knowledge is highly specific, as it evolves as “indestructible” and permanently updates intellectual capital.

“Every human has the right to education” [5; 26, §1].

A human being exists within the framework of the past and future continuum, which continuously and instantly fades away.

Education is an analyzed critical-cultural process of past events and experiences.

However, here arises a **dilemma – the likelihood of well-acquainted knowledge/experience in the future**: 1) In the **context of existence**, most probably, it will be renewed or modernized; 2) In the **absence of existence**, however, the time and energy spent on it are generally wasted and, essentially, in vain.

What does such a dilemma entail? Primarily, the fact that in previous eras, societal changes were not as dynamic, and the comparison of lifestyle was relatively stable¹. The disclosure of new revelations and perspectives required quite a few years, sometimes more. Today, the situation has significantly transformed, and progress on a societal level is rapidly advancing.

As a result, today’s present more significantly diverges from the past, and this divergence systematically increases. In other words, the current past tends to deviate more from the “yesterday’s” past, and utilization becomes less frequent.

The necessity of rethinking education emerges in a contemporary (innovative) context!

Correspondingly, there are two challenges ahead in the realm of education:

1. To learn what and how to teach;
2. To transform knowledge of new information into skills.

Pedagogical experts assert that in education, there should be adherence to the so-called “4C” approach: **Critical thinking, Communication, Collaboration, and Creativity**. [6; 343]

The insights of the enlightened figures of the ancient era about education are highly valued. For instance, **Pythagoras**, considered the originator of the first theory of education, recognized that **knowledge does not emerge solely in the present context but is rather constructed upon existing knowledge, signifying that new knowledge is acquired through a synthesis with pre-existing wisdom**. [7; 25]

Plato, on the other hand, associated wisdom with ideal knowledge and contemplated that it “...*exists somewhere, comes down, and every new piece of knowledge is born with it, and its extraction in part brings us closer to it in our world*.” [7; 27].

In our view, **Pythagoras’s contemplation of knowledge is more closely aligned with the contemporary dynamics, as the present progressive society actively engages in the search, creation, and utilization of new knowledge.**

Through education, an individual secures for oneself essential freedom and becomes a fully participating member of society.

Additionally, education and knowledge form the cornerstone of national self-reliance, inherently contributing to innovation across all sectors/spheres of the country.

Every form of advancement is closely associated with education, intertwining with the elevation of intellect. An intellectually empowered individual fosters high technological production and fulfills quali-

¹ This does not refer to fundamental scientific concepts, whose theoretical foundations, primarily, are not subject to substantial alteration or modification, in every circumstance, for both primary and secondary levels of education.

fied services, serving as a significant source of revenue growth in international collaborations.

Thus, it was in the past, so it is now, and so it will be in the future!

However, in the past, education uncritically embraced indisputable dogmas. It lacked both the necessity for questioning and the desire to explore. Contemporary methodologies no longer adhere to established doctrines and rules but utilize investigative methods (e.g., observation, experimentation, etc.) to open new horizons for knowledge, expanding its overall scope.

Therefore, they emphasize vigilant attention and critical thinking in the present world for the advancement of education and intelligence, serving as exemplars for educational and intellectual progress in society.

In the context of technology-driven progress, it is noted that resistance to educational innovation is inherent [8; 194]. Nevertheless, the modernization of the education system is imperative since society is rapidly evolving, whereas education adapts slowly!

It is essential to recognize that there is not only a crisis in the global education system but also in the existing paradigm of self-learning.

Question: **What factors contribute to the current crisis in education?**

1. **The increasing volume of information.** Therefore, the continuous education system becomes relevant. In ancient times, and even in the not-so-distant past, knowledge did not become obsolete so quickly. Therefore, it was completely legitimate to prefer the constant, the immovable over the current, the idea of the existence of the infinite over the finite.

The time for transformation has begun. The continuous pursuit and application of new knowledge have become imperative. The human lifespan has merged with the information age, demanding a continuous quest for learning.

Educated individuals consistently consider knowledge insufficient, perceiving it as a perpetual pursuit of knowledge. Recognizing that the main adversary of knowledge is not ignorance but the illusion of knowledge, a qualified specialist in the informational society is someone who can learn, can find and use innovations! [9; 31].

2. **Discrepancies within the content of education.** Society undergoes more rapid transformations than the content and structure of education, both in terms of substance and methodology.

In the digital age, profound changes in human activity have prompted numerous paradoxes within the education system. We will focus our attention on two of them:

A. Information Overload Paradox: In the age of the internet, the abundance of information, both credible and fake, poses a challenge to the user's motivation for acquiring new knowledge. Contrary to the assumption that a knowledge-seeking individual can interpret available information, distinguish the insignificant from the essential, he copies the searched text and fixes the opinions of others as his own, which is called plagiarism in academic contexts.

Moreover, the distinction between true and false information diminishes, and critical processing of information becomes a challenging task. The cognitive abilities of an individual, particularly in the realm of critical information processing, face limitations and may become distorted.

B. Information Possession Paradox: The process of obtaining knowledge requires the retrieval of relevant information. If we remember something, therefore, we have a knowledge it, if we do not remember, i.e., we don't know anymore because we forgot about it.

The digital era has significantly altered the culture of information processing. The saying that "*what is necessary is already known by Google*" suggests that technology is reshaping cognitive habits. The internet continually shapes human cognition and guides individuals to find optimal solutions from complex

situations, promoting self-discovery. [10; 499]

Looking forward, the phenomenon of information retrieval will not diminish in education, but the power will shift towards the individual's ability to navigate the overwhelming abundance of information. On the other hand, our thinking capacity will strengthen through critical thinking skills and analytical abilities.

Does the changing nature of knowledge accumulated in the cognition of individuals respond to the demands of global society? The answer is affirmative – it does not correspond! This is because the global informational database is growing intensively, making its comprehensive mastery practically impossible. However, another problem arises: how and to what extent should we know to be adequately prepared for future work?

The current system of education, primarily an artifact of the industrial era, is less effective today, failing to adequately prepare individuals for the rapid changes in the modern world. It is essential to reject the assumption that learning occurs best in stable societal conditions, as it does not equip individuals with the necessary skills for adapting to the dynamic shifts occurring in contemporary life. There is a need for a paradigm shift in education, especially in the face of ongoing challenges presented by the current complex global landscape.

The industrial education system, by its nature, is characterized by the teaching of old facts and practices [11]. It does not adequately prepare individuals for life in an increasingly non-stable environment, as it limits critical thinking capabilities and diminishes creative potential, promoting only competition rather than fostering innovative thinking.

The industrial paradigm of education is rooted in the conventional economy, where formalized knowledge dominates. It is universally accessible and can be easily transmitted, both orally and in writing.

Modern education, in comparison with theoretical approaches, is more practical, as it is closely associated with the enhancement of innovative cognitive components. On the forefront come individual creative competencies, personal motivation, and self-directed learning (self-discipline, self-employment, self-control, self-discovery, etc.), teamwork skills, and practical experience.

With the advancement of digital technologies, the traditional paradigm of education undergoes changes, integrating new forms of learning: gamification, discursive, adaptive, and project-situated learning. Group participation culture in learning is expanding, and social networks are becoming part of the educational landscape.

Contemporary education is global, meaning it is free from national boundaries and constraints.

For the period of contemporary civilization, orientation towards coevolution is significant. The future of society will depend on self-awareness, interconnections in the realm of ideas, the diaspora of relationships, and the quality of life among individuals. In society, perpetual and inevitable change is a constant. In every individual, the continuous process of birth and death persists, accompanied by the uninterrupted flow of knowledge, experiences, challenges, and ethical dilemmas. Thus, our collective knowledge evolves, and we evolve with it, adapting in every circumstance; we must change along with it!

Unfortunately, the system of education continues to lag behind the developed norms of living, especially as the new technological civilization rapidly advances. As a result, the educational system, embedded in outdated frameworks, struggles to meet the demands of the contemporary era. Moreover, the future is unfolding so swiftly that we can barely anticipate its socio-cultural responses.

In the information society, high qualifications and diverse skills are essential for employment. However, nobody precisely knows what everything should be like because the interconnectedness of our biological intelligence and techno-computer interfaces will undergo unprecedented transformations.

Thus, much of what is currently being taught may become obsolete by 2050. [6; 340]

In the digital society, employment demands different competencies. [8; 16-17]

A well-educated individual today must possess skills beyond those of previous generations. Determining when a particular skill becomes obsolete for an individual may be subjective and context-dependent. However, one thing is clear: in the new environment, acquiring new competencies is essential for employment. Moreover, with the decreasing duration of the “lifecycle of professional competencies” in emerging professions, the need for constant skill renewal is evident. It is true that hard, soft, cognitive, and existential skills may still be valuable in the future, but generally, today we require such competencies that can assist us in “defeating” the algorithms.

New challenges are emerging in front of the active education system:

1. Swift adaptation to the working environment. Today, natural resources are no longer the key to success. It is imperative for the country’s innovative development to strengthen individual potential, as jointly relying on resources limits creative potential and only enhances competition.

2. Utilization of flexible forms in employment. The active integration of flexible work models into the labor market will not only energize the workforce but will also result in more responsive individuals for employment.

3. Sectoral changes in employment. By 2030, 30-50% of existing workplaces will be “technologically outdated.” [12; 189]

In line with this, education must become an industry of continuous adaptation, accumulation of knowledge, transfer, and the development of potential. However, mechanisms for such changes will be increasingly challenging.

It is noteworthy that the educational progress in a technological cycle occurs when Nanotechnology/Biotechnology/Information Technology/Cognitive Science (NBIC) technologies synergize with each other (converge), necessitating the orientation of high-tech professions towards sustainable, humanitarian knowledge and skills, following the concepts of STEAM/STREM. The education system should comprehensively address the demands of the digital society, particularly focusing on neglected aspects such as collaboration, creativity, diversity, and inclusivity.

CONCLUSION

1. Continuous education is an inexhaustible process of self-improvement.

2. The industrial education system fails to respond to emerging challenges due to its inherent inertness, impeding technological progress.

3. In the digital society, individuals require distinct skills and competencies, where education plays a crucial role.

4. Contrary to popular belief, education (learning) is not just about the accumulation of information but involves active engagement, critical thinking, and the generation of actionable insights.

5. The new purpose of education is not to simply acquire knowledge but to proactively seek new knowledge, promoting continuous learning.

6. Well-educated individuals recognize that the main competitor of knowledge is not ignorance but the presentation of knowledge through action and application of acquired skills.

7. Specialization in new areas emerges more rapidly than the education system can adapt and respond.

8. In the digital realm, qualifications will be significant for those who possess the ability to adapt to a changing system, embrace novelties, and effectively utilize them.

9. Education should lead to the transformation of society and the creation of a more educated civilization, a trend that will persist into the future, emphasizing that the new “world,” with its rapid changes, will require less and less knowledge from previous years and more from the wisdom of emerging eras.

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ინდუსტრიული განათლების ხარვეზები და თანამედროვე გამოწვევები

გურამ ჯოლია

საქართველოს ტექნიკური უნივერსიტეტის პროფესორი

E-mail: g.jolia@gtu.ge

რეზიუმე

სტატიაში განხილულია ადამიანის ორმაგი ბუნება, როგორც ყველაზე ძლიერი და ყველაზე სუსტი არსება დედამიწაზე. ნაჩვენებია გონების ძალით თუ როგო შეძლეს მათ კაცობრიობის განვითარება, თუმცა, იმავდროულად, შეინარჩუნეს ოდითგან თანდაყოლილი უზნეო და აგრესიული უნარ-ჩვევები. ყოველივეს გამოსწორება კი (თუნდაც ნაწილობრივ), მხოლოდ განათლებით მიიღწევა.

მოცემულია განათლების უნიკალური ბუნება, რომ იგი არც მემკვიდრეობით ან ყიდვით, ჩუქებით, მითვისებით და არც იძულებით სხვას არ გადაეცემა. განათლება თვითმოპოვებადი, თვითშეძენადი ფენომენია. ამასთან, შეძენილი განათლება (ცოდნა) მეტად სპეციფიკური საქონელია, რადგან ძალიან "მალფუჭებადი" და პერმანენტულად განახლებადი ინტელექტუალური კაპიტალია.

ნაჩვენებია სასწავლო პროცესის თავისებურებები, დიდ მოაზროვნეთა (პითაგორას, პლატონის და სხვათა) შეხედულებები ცოდნის (განათლების) შესახებ. დახასიათებულია განათლების მსოფლიო კრიზისის მიზეზები და ფაქტორები, ასევე საგანმანათლებლო სისტემის ამოცანები და პარადოქსები.

განხილულია განათლების თანამედროვე მოთხოვნები, უწყვეტი განათლების სისტემის გენეზისი და დღევანდელი, ინდუსტრიული საზოგადოების საგანმანათლებლო სისტემის ხარვეზები და ახალი გამოწვევები, ციფრული წიგნიერება (კომპეტენციები, უნარ-ჩვევები) და განათლების მოდერნიზაცია.

კვლევის მიზანი: ზოგადად, კაცობრიობის განვითარებაში განათლების როლისა და მნიშვნელობის წარმოჩენა, კონკრეტულად კი, ინდუსტრიული საზოგადოების საგანმანათლებლო სისტემის ხარვეზების ჩვენება და განათლების მოდერნიზაციის აუცილებლობის დასაბუთება.

კვლევის მეთოდები: მეცნიერული აბსტრაქციის, ანალიზისა და სინთეზის, ინდუქციისა და დედუქციის, ისტორიულ-ლოგიკური კვლევის მეთოდები.

საკვანძო სიტყვები: საინფორმაციო ტექნოლოგიები, პარადოქსი, კრიზისი, პილარი, ინტერნეტი, კომპეტენცია, ინოვაცია, გენეზისი.

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