

RETHINKING THE FUTURE OF EDUCATION: INNOVATIONS IN MODERN TEACHING COMPETENCIES

Mammadova G.

Azerbaijan State Pedagogical University,

Faculty of Primary Education,

the teacher of department of primary education pedagogy

<https://orcid.org/0000-0002-6248-9265>

Baku, Azerbaijan

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Abstract

One of the most distinctive features of the modern world is the rapid pace of change occurring across nearly all spheres of life. These transformations profoundly affect both individual and social existence, and social institutions are not exempt from this process. Educational institutions, in particular, emerge as some of the most responsive and adaptable structures in the face of such change. Naturally, various factors make this transformation inevitable. This theoretical study analyzes the relationship between the evolving nature of the teaching profession and the dynamics of a rapidly changing world, while also presenting theoretical propositions regarding the future of teaching. The study argues that factors such as technological advancement, increased investment in education, social transformation, shifting societal demands, the growing influence of parents, rising student numbers, the role of mass media, and the demand for quality education make change within the teaching profession unavoidable. However, the drivers of change are not limited to these factors; several additional elements further accelerate this process. Some studies associate the extensive application of educational technologies with the potential disappearance of the teaching profession in the future. In contrast, other research emphasizes that, since human beings are inherently emotional and social, an education system without teachers is unlikely to emerge. In this regard, the teacher remains not merely a transmitter of knowledge, but a central figure addressing learners' psychosocial needs. The study concludes that the teaching profession will not vanish in the foreseeable future; rather, the role and status of teachers will undergo transformation. The teacher of the future will be a multifaceted individual—technologically literate, adaptive, and equipped with strong interpersonal and social skills.

Keywords: teaching profession, future of education, future teacher

Introduction

No society is stagnant or static; every society experiences continuous dynamism and transformation. However, social change does not always manifest in a clear or consistent manner, nor does it proceed at a uniform pace. At the core of these changes lies the individual—both as an agent influencing change and as one influenced by it. Innovation, encompassing the emergence of new ideas and methods, not only challenges the past but also shapes the trajectory of a society's future.

In this regard, education plays two fundamental roles with respect to innovation: first, to equip society with qualified professionals capable of meeting modern and innovative demands; and second, to facilitate these changes with minimal social resistance or “friction.” Within this framework, as with all professions, numerous questions arise concerning the future of teaching. What awaits the teaching profession in the coming years? Will its social prestige and functional significance increase, decrease, or undergo complete transformation? Could teaching itself be redefined or even rendered obsolete?

It is important to note, however, that it is impossible to predict with absolute certainty what the teaching profession will look like in ten or twenty years. As Yaşaroğlu (2018, p. 17) aptly observes, “no one possesses a crystal ball” to foresee such developments.

Education, often characterized as an open system, is understood as a process of stimulating continuous and purposeful change in learners' behavior. In this sense, universities, as centers of educational activity, must aim not only to impart knowledge but also to prepare students for real-life challenges after graduation (Jukes, McCain & Crockett, 2010, pp. 19–20). During periods of profound transformation, societies may experience what can be termed “paradigm paralysis”—a form of conceptual stagnation in the face of future-oriented challenges. Such situations may necessitate abandoning previously accepted ideas and values in light of new realities. Therefore, when developing strategies and goals for the future of education, this reality must be acknowledged.

It should also be noted that ongoing and dynamic changes affect not only technology and the economy but also all social systems—particularly education. These influences encompass a wide spectrum, ranging from the content of education to its organizational structures, pedagogical approaches, and teacher–student relationships.

The present era is characterized by rapid change, intensifying competition, and the pervasive influence of globalization across all domains. Under such conditions, opportunities and risks alike have increased significantly for individuals, institutions, and nations. Importantly, these changes are neither random nor accidental; their underlying causes can be summarized as follows:

Factors Driving Change In Education And The Transformation Of The Teaching Profession

1. Rapid Advances in Science and Technology
2. Acquisition, Utilization, Analysis, and Development of Information
3. Emergence of New Problems and Needs Confronting Humanity
4. The Individual's Drive for Self-Realization and the Associated Demands

These factors represent the primary drivers of change and exert a significant influence on nearly every dimension of future life. In the contemporary era, remarkable progress has been achieved in the field of information and communication technologies—particularly in the collection, processing, transmission, and application of information, as well as in the production of new knowledge. This technological transformation has led to profound changes both in educational curricula and in societal expectations regarding the outcomes of education. The challenges brought about by such change necessitate the evolution and transformation of the teacher factor—the most dynamic and adaptable component of the educational system.

In this context, teachers assume a crucial role in the implementation of renewed educational programs and in the cultivation of students who are engaged, creative, innovative, and capable of working collaboratively. The organization of future teaching and learning processes will, to a considerable extent, depend on educational policies developed at the individual and collective levels. Despite the emergence of technologies whose full potential is not yet realized, the fundamental nature of instruction—defined by the values, knowledge, competencies, responsibilities, and goals of those who teach—must remain central.

Rapid technological progress continues to influence education profoundly. The integration of technology into teaching—exemplified by the use of robots and artificial intelligence-based systems in universities—indicates that both the structure of instruction and the very essence of the teaching profession are subject to transformation. Such innovations may necessitate the redefinition of traditional teacher roles and require educators to adapt to new positions that involve collaboration with technology. Consequently, the future of education will depend not only on technological advancements but also on how and for what purposes these technologies are integrated into learning environments—and, most importantly, on the attitudes and adaptive capacities of teachers toward such change.

Although a number of reforms have been implemented in Azerbaijan's teacher education system, many educators continue to rely on traditional instructional methods characteristic of previous eras. Despite the modernization of university infrastructure and the introduction of advanced technologies, the persistence of outdated teaching approaches remains a significant challenge. Expecting different outcomes from students without corresponding transformations in teachers' pedagogical practices appears unrealistic. In this regard, Harwell's (2003) oft-cited assertion aptly captures the situation: "If you always do what you've always done, you will always get what you've always

gotten." This statement underscores the importance of teachers' critical reflection on their own practice and their openness to pedagogical change. If the anticipated transformations within the education system are to be realized, and if students are to be equipped to meet the demands of a new era, such change must begin with teachers themselves.

Purpose and Methodological Approach of the Study

The primary objective of this study is to project possible directions for the future development of the educational environment and to forecast the nature of anticipated transformations within the teaching profession. To this end, the study analyzes existing scholarly approaches and practical initiatives concerning the overall future of education, with a specific focus on the evolution of teaching as a profession. Drawing on current literature, potential future scenarios are systematized, classified, and discussed within an academic framework. Within this scope, examples of technological integration into contemporary educational settings are examined alongside an in-depth analysis of the concept of "change" and the principal factors necessitating such transformations.

Reasons Necessitating Change

As in all professional fields, transformation within the teaching profession has become inevitable due to a combination of objective and subjective factors. The principal forces driving change in modern teaching can be summarized as follows:

1. Social Transformations and Societal Expectations of Teachers

Rapid and multifaceted social transformations have made it necessary to reconsider the roles of educational institutions, educational systems, and teachers in particular. Compared to two decades ago, education has evolved into a far more complex and multidimensional process. This complexity demands not only the transformation of teaching methodologies but also the redefinition of teachers' functional roles. Contemporary society no longer perceives teachers solely as transmitters of knowledge; rather, they are viewed as key figures in shaping students' social, emotional, technological, and civic competencies. Consequently, teachers are required to adapt their traditional roles to the expectations of an evolving society.

One of the most significant social developments affecting education is the growing involvement and assertiveness of parents. Parents today seek not only to ensure that their children's current educational needs are met but also that they are prepared to face the challenges of the future. This expectation has a direct impact on teachers' professional preparation, their pedagogical approaches, and their engagement with the educational process. Collectively, these dynamics indicate that social change will continue to bring about profound transformations in teachers' roles and functions. As a result, teaching is progressively becoming a more flexible, multifaceted, technologically enriched, and socially oriented profession.

2. Parental Influence and the Expanding Social Role of the Teacher

In recent years, there has been a notable increase in the number of working parents. At the same time, higher divorce rates and the decreasing amount of time parents spend with their children have, in many cases, negatively affected children's emotional and social development. Consequently, some of the traditional functions of the family in child upbringing have shifted toward teachers. In today's context, many of the values, social norms, and emotional support mechanisms once transmitted within the family are now being provided within educational institutions—primarily by teachers.

As a result, parental expectations increasingly rest on the assumption that nearly all aspects of their children's development should be addressed within the school environment. This, in turn, is often linked to the limited time and attention parents can devote to learning activities at home. Such circumstances can be interpreted as a partial transfer of parental responsibilities to teachers. Accordingly, teachers are no longer merely facilitators of academic learning but also play active roles in affective (emotional and social) education. This shift substantially expands teachers' professional workload and spheres of responsibility.

Hence, as the functional boundaries between the family and the educational institution become increasingly blurred, the teacher's role grows more multifaceted and complex. This situation calls for new approaches in teacher education—particularly those that emphasize the development of social and emotional competencies alongside professional and technological expertise.

3. Changes in the Student Model and the Role of the Teacher

In the contemporary educational process, the traditional student model has undergone a fundamental transformation. Students are no longer perceived as passive recipients of information but as active participants who construct their own learning experiences. In modern classrooms, students engage in discussions, group work, and diverse learning activities rather than merely listening to lectures. This shift has profoundly affected the teacher's role, transforming teachers from transmitters of knowledge into facilitators of learning—organizers and enablers of the educational process (Çakmak, 2011). Education today is therefore understood not as a simple transmission of information but as a comprehensive system aimed at promoting students' multidimensional development.

Moreover, teachers are now expected to support students' healthy and balanced development and to engage meaningfully in their lives. Students increasingly face physical and emotional violence, neglect, and a variety of personal and social problems, and teachers play a vital role in addressing these challenges (Deiro, 2005). In this sense, the teacher's role extends beyond pedagogy to encompass social and emotional support functions. Consequently, in modern educational contexts, teacher–student interaction must adapt to new dynamics, with the learning process directed toward the simultaneous development of academic and social competencies.

Integration of Technology into the Education and Learning System

Mass media have significantly expanded access to information, allowing students to recognize the importance of using diverse informational resources, including those employed by their teachers. The continuous influx of new digital media tools into the educational environment accelerates this transformation. Teachers who rely solely on verbal instruction are increasingly perceived as ineffective. Instead, educators can enhance student motivation by presenting content in engaging and interactive ways through the effective use of powerful information resources. In this context, the need for a “digital revolution” in the education system becomes evident.

The teaching profession, accordingly, must evolve through the digital learning revolution into a domain that enables exceptional educators to reach larger audiences and in which their expertise is both recognized and rewarded (Hassel & Hassel, 2011). Among the various forces driving educational change, technological advancement and its integration into learning processes are among the most significant. Some researchers predict that in the near future, robots and biotechnological education will become realities, arguing that technological progress could transform all sciences and reshape our understanding of human and natural structures. The increased use of technology in education will likely alter both the teacher's role and the very concept of education itself.

However, these transformations are not without potential drawbacks. Several scholars caution that technological systems operating beyond human oversight could give rise to artificial entities, thus introducing potential risks and ethical dilemmas into every scientific and educational advancement (Sönmez, 2002, p. 320).

Sharkey (2016) proposes four possible scenarios for the use of technology in future classroom environments:

1. **Robot Teachers:** The teacher figure in the classroom is replaced by a robotic entity that serves as the main source of information and manages the instructional process.

2. **Robots as Peers and Companions:** Robots act as learning partners or classmates, facilitating interaction and engagement.

3. **Robots as Caregivers and Assistants:** In these cases—collectively referred to as support robots—the robotic systems do not replace human teachers but serve as aids that simplify instructional tasks. They do not occupy positions of authority but operate in supportive roles.

4. **Telepresence Robots:** These robots enable remote instruction, allowing human teachers to conduct lessons in real time without being physically present in the classroom.

In our view, the primary objective of most robotics researchers is not to replace teachers entirely but to enhance the educational experience by positioning robots as stimulating and engaging tools that add value to the learning process. For successful integration of robots into classrooms, human teachers must be able to operate these technologies with ease. This, in turn, requires

the development of appropriate interface mechanisms—software systems, technical devices, or mobile applications—that allow teachers to manage robots with minimal training (Ahmad & Mubin, n.d.).

The process of digitalization in education is not new; it has been underway for decades. One of the earliest examples of technology integration in education was Apple's "Apple Classrooms of Tomorrow (ACOT)" project in the 1980s. In the 2000s, the "Preparing Tomorrow's Teachers to Use Technology" initiative represented another significant milestone in this direction (Pamuk, Çakır, Ergün, Yılmaz & Ayas, 2013). Today, a wide variety of educational robots are available, ranging from simple microprocessor-based mobile units to complex humanoid systems. The choice of robot type depends largely on the learning objectives, the educational field, and the students' age group. Small-scale robots are typically used in robotics and computer science education, while humanoid robots—due to their natural and engaging communicative abilities—are often employed in language learning contexts (Ahmad & Mubin, n.d.).

Disadvantages of Technology Use in Universities

Although technologies used in university environments offer numerous advantages, they also raise concerns. For example, robotic instructors can engage with large numbers of students simultaneously and offer "unlimited" learning opportunities through video-based instruction. Furthermore, intelligent software that personalizes learning experiences increases student engagement and facilitates individualized learning environments (Hassel & Hassel, 2011). Research also shows that students enjoy interacting with robots in educational settings, and such interactions significantly enhance their motivation to learn (Ahmad & Mubin, n.d.). Empirical findings indicate that information taught by robots was retained 27% more effectively compared to content that was not robot-mediated. Based on such results, researchers argue that robots can serve as efficient and cost-effective tools for enriching the learning environment.

Nevertheless, public concern persists regarding the increasing use of high-tech tools—particularly robots—in university education. Studies reveal that public attitudes toward educational robots remain ambivalent. For instance, a 2012 survey conducted across Europe with over 27,000 respondents found that 34% of participants believed the use of robots in education should be prohibited, while 60% considered it inappropriate for robots to care for children, the elderly, or people with disabilities. Only 3% regarded the use of robots in education as desirable (Sharkey, 2016). These results suggest that the integration of robots into educational environments has yet to gain full public trust and acceptance.

As previously noted, the rapid emergence of digital learning has given rise to predictable debates within the field of education. Teachers' unions and their representatives have voiced the argument that "a teacher cannot be replaced by a laptop" (Hassel & Hassel, 2011), expressing concerns over the potential of tech-

nology—including online learning, digital course programs, video lectures, and other technology-based instructional methods—to supplant human educators. From the teachers' perspective, the integration of robotics and other technological tools into the teaching process presents certain challenges and difficulties.

First, robotics-based instruction requires considerable time, both during class (for construction, design, and testing stages) and outside of class (for lesson planning, gathering materials, troubleshooting, and preparation). Moreover, factors such as the high cost of materials, limited classroom space, and short lesson durations create restrictive conditions even for the most motivated and innovation-oriented teachers (Cejka, Rogers, & Portsmore, 2006). Consequently, teachers often prefer to maintain full control over the use of robots, expressing skepticism toward the technical reliability of these systems and favoring their use as assistive tools or companions that support student learning rather than as replacements for human instructors.

The support and endorsement of educational administrators also play a crucial role in shaping attitudes toward robotics in the classroom. Research indicates that teachers may experience fatigue and obstacles when attempting to introduce robotics into their classrooms without institutional backing (Cejka et al., 2006). Therefore, administrative support can serve as an important mechanism for alleviating teacher concerns and facilitating the adoption of innovative technologies.

Ethical concerns surrounding the use of robots in education have also been raised. Questions related to transparency in monitoring robot performance and accountability for errors remain unresolved. The use of robots in contexts involving vulnerable populations—such as children or the elderly—raises significant issues of oversight and responsibility.

As products of artificial intelligence, robots enable the creation of artificial environments within the teaching process. However, research shows that many students perceive robotic voices as unnatural and experience difficulty adapting to such environments. The integration of robots into education also entails privacy-related risks. Previous discussions have questioned the potential intrusion of robots into individuals' private lives. The collection of personal data through robotic sensors may compromise privacy: information gathered—even from a single monitored individual—can be transmitted to human monitors or stored in the robot itself for potential access by others (Ahmad & Mubin, n.d.).

Additionally, the implementation of robotics in education raises concerns about employment. Teachers and teachers' unions argue that widespread adoption of robots within education could threaten the job security of educators and other educational staff worldwide (Soffar, 2016). Another major concern relates to the possible reduction of human interaction resulting from the use of social robots. Critics argue that robotic teachers cannot replicate the creativity and innovation of human educators when delivering instructional material. The silicon-based brain of a robot, they contend, cannot match the productivity of the carbon-based human

brain and thus lacks the capacity to respond creatively to novel or ambiguous questions.

Furthermore, robots' evaluative and feedback functions are often deemed inadequate: they cannot provide meaningful positive reinforcement or constructive criticism, interpret student work effectively, or accommodate individual differences (Goldstein, 2013). It is also suggested that reliance on robots might hinder children's ability to develop personal responsibility. A lack of emotional connection or bonding between children and robots constitutes another potential disadvantage, as does the lower level of socialization observed in classrooms that utilize robots—factors that may impede the development of students' interpersonal skills.

From an economic standpoint, the integration of technology into educational environments is consistently associated with high costs. Robotic teachers, in particular, represent expensive technologies whose implementation may further exacerbate financial concerns within the education sector.

The Role of Universities in Shaping Future Teachers in Azerbaijan

In today's modern, globalized world, university education has become a critical component of each nation's socio-economic development, competitiveness, and sustainability. As a unique and essential element within the education system, universities contribute significantly to fostering innovation, human capital, and cultural development. It is therefore not coincidental that UNESCO has identified universities as indispensable institutions for supporting social progress, economic growth, the production of competitive goods and services, the preservation of cultural identity, social cohesion, poverty reduction, and the promotion of a culture of peace.

At present, university education is both a prerequisite for maintaining a strong position in the global knowledge economy and a key factor in ensuring individual and national competitiveness. It has also become a central component of economic operations and policymaking processes.

In general, improvements in the quantitative dimensions of education are expected to be accompanied by qualitative enhancements. However, while the number of teachers and students in universities has increased, this growth has not necessarily resulted in qualitative improvements. The expansion in quantity has, in fact, complicated the understanding and measurement of quality. This situation requires teachers to remain aware of the evolving nature of their professional roles, to adapt to new realities, to ensure continuity in instruction, and to strive for excellence across all domains of education.

In this regard, the "Future Education Leaders of the Pedagogical University" competition, successfully launched at the Azerbaijan State Pedagogical University in 2024, continued in 2025 as its second season. With the participation of 400 students, the competition was conducted in four stages.

•In the first stage, participants were assessed on their knowledge of Azerbaijan and the university, as well as their general worldview.

•The second stage evaluated logical reasoning, information processing, and analytical thinking skills.

•During the third (semifinal) and fourth (final) stages, participants demonstrated their abilities to work individually and in teams, employ strategic thinking, design and present projects, and exhibit public speaking, presentation, self-expression, and creativity skills.

The final round, held on May 9, 2025, identified ten students with the highest performance. Sponsored by bp Azerbaijan, the competition's primary objective was to support the professional development of talented students and to cultivate the future human resource potential of the university. Each winner received a ₼1000 monetary award, unique gifts, and the opportunity to participate in a year-long professional mentorship and development program.

Thus, in order to broaden the scope of prospective teachers' research competencies, a survey was conducted among first- and second-year students enrolled in the Primary School Teacher Education program (future primary school teachers). The results of this survey made it possible to draw several key conclusions.

First, the analysis of the findings revealed that student participation in research activities within universities remains quite limited. The instructional process largely retains an executive and reproductive character. The primary reason for this situation lies in students' tendency to prioritize rote learning over analytical or investigative engagement.

Second, among first-year students, performative approaches continue to outweigh innovative ones. Lecturers and instructors generally do not devote sufficient time during lectures and seminars to support the development of students' research skills. Consequently, the learning process is primarily confined to passive listening, reproductive explanation, memorization of lecture content, and similar activities. Finally, insufficient attention is paid to cultivating students' research abilities, and the independent assignments they are given are often implemented without clear methodological direction or qualitative intent.

Higher education institutions, while delivering state-mandated curricula and applying various instructional technologies, succeed in fostering certain professional skills among graduates. However, there is little evidence of systematic effort to prepare students for adaptability in dynamic contexts or to enable them to perform effectively in nontraditional situations. Moreover, the insufficient consideration of existing traditions and values within the process of teacher preparation represents an additional area of concern.

In our view, the shock caused by the pandemic—similar to developments in other sectors—is likely to deepen the divide between under-resourced and well-established higher education institutions. Its impact will likely compel universities and colleges to address long-overdue reforms, increase specialization, strengthen collaboration networks, and even merge with other institutions if unable to sustain independent operation. It appears that institutions that recognize the shortcomings revealed by this crisis, acknowledge the opportunities created by new realities, and implement

innovative solutions promptly will enter the “new normal” era from a stronger position.

Conclusion

Among the main factors shaping the educational environment are social changes, public expectations, parental influence, transformations in teaching models, the evolving concept of quality, and the integration of technology into the learning process. Under the influence of these factors, transformations in education are inevitable—and these changes will also reshape the role of teachers.

Research indicates that the use of robots in instruction increases students’ motivation and engagement while expanding opportunities for individualized learning. Such advantages make the incorporation of technology into educational settings practically indispensable. Considering the trajectory of technological development, it is highly probable that the tools used in universities in the near future will be more advanced, functional, and comprehensive than those available today. Nevertheless, this does not preclude the use of robots at other educational levels. Depending on the lesson’s objectives, artificial intelligence tools can also be successfully applied in various stages of education.

Scholars argue that this trend could fundamentally transform the role of teachers within the education system—an idea often summarized by the phrase “from the sage on the stage to the guide on the side.” In other words, while the roles of educators in the future will differ from those of the past and present, their functions will not disappear entirely. Teachers of this new era will help students acquire the knowledge, skills, behaviors, and values necessary to become responsible parents, competent professionals, and productive citizens.

Accordingly, it can be projected that the teaching profession will not vanish but rather evolve in form and function. Just as today’s teachers differ from those of the past, tomorrow’s teachers will likewise differ from the educators of today.

At the same time, it must be acknowledged that the use of technology carries certain disadvantages. Based on this argument, the future direction and purpose of education must remain centered on the individual. Minimizing the potential negative effects of technological integration begins with effective and deliberate planning. Teachers must therefore adopt preventive strategies and safeguards to ensure that those they educate do not develop undesirable traits or dependencies.

From the conducted research, it can be concluded that, at least in the near future, teachers will continue to hold the most favorable position for cultivating students’ higher-order thinking skills, analyzing complex problems, applying knowledge and competencies, comprehending abstract concepts, and generating innovative ideas and solutions.

Although technological progress has deeply affected not only individual lives but also interpersonal communication, social dynamics, and international relations, the human element will never lose its significance. Hence, while education must continually adapt

to technological advancements, the complete removal of the human factor is neither possible nor desirable. This reality underscores that the teaching profession will continue to exist and maintain its vital role in the world of the future.

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