Proceedings of the International Scientific Conference SEA-CONF

SEA-CONF PAPER • OPEN ACCESS

The New Posture of the Education and Training System; Inevitable Changes to Meet the Future Requirements

Available online at www.anmb.ro

The New Posture of the Education and Training System; Inevitable Changes to Meet the Future Requirements

Ergun DEMIREL

Piri Reis University, Tuzla Istanbul, Turkey
ergundemirel@yahoo.com

Abstract. The influences of technology and extension of globalization cause drastic changes in all social and economic activities. As a result of the globalization and increased cooperation between countries, significant changes occurred in the field of education throughout the World. Aims, priorities, systems, procedures, and processes of educational institutions are changing to meet the new requirements of society in the 21st century. The posture of the education system in developing countries drastically changed including delivery methods, type of the education and training as well as organization and management system to adapt new applications. In addition to the existing mission (teaching and research) of education institutions, new tasks have been added to establish continuous and strong links with business and industry sectors and society. The aim of this study is to define new posture of the higher education system by reviewing significant changes in the education and training system and to propose some improvement issues for the officials of developing countries. The study starts with the review of related literature which is mainly based on research made by academic institutions, internationally recognized governmental and non-governmental organizations concerning forecasts on the requirements of digital era for education system. After summarizing new improvements in the technology, it is intended to make an evaluation on the impacts of the education conducting meta-synthesis. As result of this evaluation, an investigation is conducted to adopt these improvements into Education and Training system. Then it is aimed to define new posture of education which may assists education institutes to make necessary correction to meet new requirements.

Keywords: The Posture of Education System, The New Roles and Mission of Education Sector; Teaching and Learning, Continuous Education, Lifelong Learning

1. Introduction

Technological developments are adapting new notations such as virtual reality, augmented reality, and artificial intelligence which are difficult to for many people to adopt their life. Though not created lastly, these complex technologies have spread quickly—largely through the proliferation of mobile devices—into the hands of people around the world. While virtual reality immerses users in a completely artificial "space", augmented reality presents layers of new information superimposed on the "real world." Both have potential functions in the learning industry but will most likely have slightly different use cases (Lessonly, 2016).

The rapid change in the technology revises overall posture of the world. The real world and virtual world are amalgamated and sometimes we are confused on which world we live in. It is difficult to

understand and hard to adopt this new situation in our life. The change in business and industry also affects the social life and attitude of the community. The education, one of the key elements of the society is very much influenced from this improvement. Many research centres throughout world are launching out new studies to make the existing education systems better.

As an example, UK-based Centre for Learning & Performance Technologies (Top 100 Tools for Workplace Learning, 2017) published their ideas under following issues on the changing education system.
- Personalized learning and training course recommendations,
- On-demand, personalized productivity, and performance support,
- Virtual learning

The main theme is to create an education system to meet existing and future requirements of the society taking advantages from improvement of the technology. Human element is still the key factor to obtain productivity and cost/operational effectiveness. It is also realised that personalized teaching is gaining more importance in relative to the teaching in groups. By considering the rising value of personalized education, to better conditions and opportunities, developed countries are looking for qualified and composite education systems.

Widely usage of information and communications technology (ICT) changed the configuration of the education. A new terminology is added in the education system which is "Independent Learning." It is internationally referred to "personalisation of learning", "student-centred learning" and "ownership of learning." Independent learning introduced a new approach to the roles of student and teacher roles and relationships in the education system.

The Schools and Families Research Report published by United Kingdom Department of Children (Schools and Families Research Report 051, 2008) lists the potential benefits of independent learning. The advantages of the independent learning techniques in relative to the traditional techniques are explained as follows.

- Improved academic performance.
- Increased motivation and confidence.
- Greater student awareness of their limitations and their ability to manage them.
- Enabling teachers to provide differentiated tasks for students.,
- Fostering social inclusion by countering alienation.

In traditional education and training systems, the main elements are the schools and other education centres. But following the introduction of electronic and internet technology, new elements were added in the system to respond requirement of the new posture of the education. Base on the 'Top 100 Tools for Workplace Learning 2017'. Hart (2017) introduces these new elements for the design, delivery and management of workplace training, i.e.

- e-learning authoring tools – to create online courses and other online instructional content, like animated explainers.
- Content development tools – to create and edit interactive PDFs, graphics, audio, animation, video, for screen capture and screen-casting, as well as augmented and virtual reality content tools.
- LMS (Learning Management System) and learning platforms – to host and manage online learning.
- Classroom response tools - to provide interaction, polling, quizzing and feedback in the classroom.

Adaptation of changes in education system meeting new requirements is not easy due to classical organization and understanding. In many countries, education system in all level is very much dependent on the state schools/universities. As an example, Bahçeşehir College (Bahçeşehir, 2018) claims that they apply "Personalized Learning Model" which is also referred with concepts like individual learning, personalized education, and tailored education. But they met many objections of regulatory authority which is Higher Education Council. Changes in education are seen be made easily in private schools rather than state schools. Therefore, training systems adaptation to the new technological developments is very slow in most of the countries.

The education is now overflowing from the schools to the workplaces. Workplaces are not used only on the job training. The new education media provided by industry become a natural classroom for education and training institutions. A close relation between education institutions and workplaces becomes rather important to provide coordination, cooperation and collaborations between the schools and business and industry. Additionally, the developing countries have an important advantage to transfer best practices into their systems by paying a very small remuneration. To plan their improvement programmes, they need to understand change, mainly to be able to feature the new posture of the world.

The COVID-19 pandemic has dramatically changed the world public opinion on education. International organizations such as OECD and UNICEF conducted research and published the results to reduce the negative effects of the pandemic. They focused on mainly continuation of education in emergencies in particular the reopening of the schools and creating alternatives to provide uninterrupted education.

To this end, there is a huge evolution in the education and training system which enforce us to review and reshape our existing acquis in this field. Ignoring these changes in the world of education can lead to consequences that will affect our future awfully.

2. Research Method

The aim of this study is to define new posture of the higher education system by reviewing significant changes in the education and training system and to define some proposal for developing countries for improving their systems.

The objectives of this study are.
- To understand effects of technologic development in the education sector
- To evaluate new knowledge, skills, and competency requirements for learners and students
- To analyse the reflection of existing and future requirements to academic programmes
- To revise education system to meet the requirements of digital age including organization of education organizations, programs, and delivery methods

The study starts with the review of related literature which is mainly based on research made by academic institutions, internationally recognized governmental and non-governmental organizations concerning forecasts on the requirements of digital era for education system. After summarizing new improvements in the technology, it is intended to make an evaluation on the impacts of the education conducting meta-synthesis. As result of this evaluation, an investigation is conducted to adopt these improvements into Education and Training system. Then it is aimed to define new posture of education which may assists education institutes to make necessary correction to meet new requirements.

It is understood that that would not be easy to adopt all these changes but at least it could be easy to make some changes to mitigate some problems in the education system of developing countries.

This study may help the researcher to understand the new posture of the education systems in the era of innovation where technology dominates all. This posture may be used as a reference to establish plans for successful implementation of large-scale changes.

3. Research

3.1. Breakthrough Technologies and New Trends

Information Technologies have developed tremendously since 1980. As a result of the use of personnel computers and the widespread use of the internet, the effective use of IT in all business areas has developed. This inevitable rise of IT continues rapidly. Artificial Intelligence, IoT (Internet of Things), Robotics Blockchain and Quantum Computing are developing a little more every day in the 2020s. Of course, education also gets its share from this development. Figure 1 compiled from Hackernoon (Erik & Vermeulen, 2018) shows this improvement.
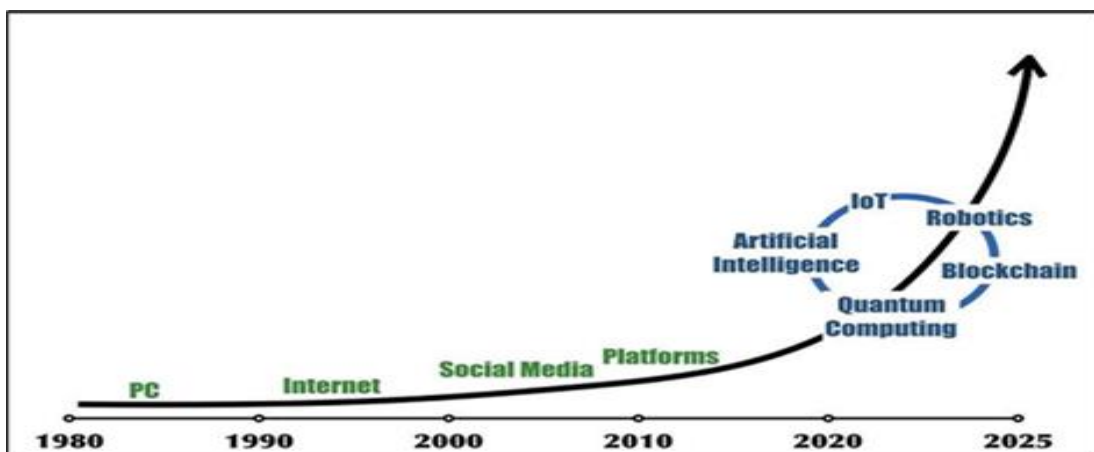

Figure 1. Development of IT since 1980 (Compiled from the Hackernoon)

Salim Ismail et al (2018) have made an estimate on "Likely Breakthrough Technologies" in their famous book, Exponential Organization.

- Sensors and Internet of Things (IoT): Potential new business models due to connected products will be the main result of this improvement.
- Artificial Intelligence (AI), Data Science & Analytics: This will empower the use of Machine Learning and use of Deep Learning algorithms to process vast amounts of information.
- Virtual & Augmented Reality: This will provide potential for remote viewing while centrally located experts provide guidance and direction as well as improve quality and training.
- Bitcoin and Block Chain: Extremely low-cost transactions that are secure powered by a public ledger that logs everything will be provided.
- Neurofeedback: Feedback loops will enhance the brain to a high level of precision and reduce stress.

3.2. Improvement in the Education Systems

The world is rapidly changing. This rapid change should include in reshaping the education and training system to meet knowledge and information requirement of the business and industry as well. The

classical system is based on the activities of teaching the students' knowledge for his requirement. But nowadays the education system has been turned a complex entity to provide learning for learners with a composition of "education, training, communication, collaboration and knowledge sharing". Even if technologic improvements in particular information technologies bring in many assets to facilitate learning, classical systems are very much far from taking advantage of those opportunities.

Centre for Learning & Performance Technologies (C4LPT) has defined the modern education system which is executed in 5 stages: Training in classroom, E-Learning, Blended learning, Social learning, Modern Workplace learning. This staging is highly complicated but necessary to meet todays and future requirements of business and industry. To apply such a system needs a highly complex organization and management system. It also requires adding a new task as "strong relations with society" into the existing mission of the university which is teaching and research.

MWL (Modern Workplace Learning) always claims that" to support all the ways of learning at work is more important than modern training. MWL made a study called. 'MWL 2021' of which theme was "Back to Basics". This study explains basis of Modern Training as micro training, virtual sessions, group learning, hybrid learning, collection and analyse of data. Then make proposals to achieve Continuous Learning covering: Inspire modern managers, Foster modern workers, Encourage reflective practices, Support knowledge sharing, Promote a daily self-learning habit, and Adopt a formal self-development process.

To improve modern education and training:

A strong link should be established between universities, business, and industry to provide mutual knowledge exchange and information support. Universities should establish coordination, cooperation, and collaboration platforms not only with industrial sector but also with trading sector to enable learners to be competent to achieve their future roles. Education institutions should be capable to support "continuous learning" to assist people in society to follow latest improvement in the business and industry as well as they should adapt themselves and be capable of using workplaces as natural classrooms by having mutual agreements for additional teaching requirements.

Higher Education

Higher education serves not only as a training and education providing institution but also a representative of the public conscience and interest in all countries all over the world. This fact is accepted by many international organizations and society.

UNESCO has submitted "World Declaration on Higher Education for the Twenty-First Century" with Vision and Action (UNESCO, 1998). The aim of the university is to take part in the sustainable development efforts and improvement of society as a whole by: educating people able to meet the all kind of emerging requirements of human; developing, creating and distributing knowledge through training and research; contributing cultures in the scope of different cultural richness; providing opportunities for learning throughout life; contributing to the other type educations in all levels; and improving civil society by educating and training the people in the values which form the foundation of democracy in all communities and by providing perspectives in the discussion of change opportunities facing societies. There is no further anonymous declaration on this subject made by United Nation organizations. The main characteristic of the higher education is introduced as follows.

- Because of the public character of the higher education, regulating authority responsibility must remain in the hands of competent bodies as designated by respective communities.

- Education opportunities transferred from other countries must contribute to the efforts of developing countries to develop and enhance their own domestic higher education systems.
- The internationalization of higher education is a necessity to improve the quality and relevance of the academic endeavour and research mission.
- Quality is a key objective for both domestic and international education efforts, irrespective to the mode of delivery.
- International higher education activities must be based on a commonly defined regulation.
- Public and private sector cooperation and collaboration matters in higher education differ significantly from most other service sectors. The private sector is more interdependent and flexible to assume new improvements.
- A very special caution must be exercised before reforming or changing the higher education institutions without getting obvious benefit because the quality, integrity, accessibility, and equity of those institutions have special importance.
- Coordination and clear consultation for all the reform or improvement efforts with all the stakeholders of the higher education are a must because of the common nature of the public interest.

By making a general evaluation on these internationally recognized values of higher education, the following inferences could be made.

- Developing countries should evolve their domestic higher education systems by themselves because of the regulation nature of the higher education.
- Additionally, the internationalization of higher education is very beneficial for people under education due to that the global educated and trained human requirement is raising.
- Quality in the education and training is a key necessity for both domestic and international higher education.
- Collaboration and cooperation efforts of the international higher education must be based on the defined international rules by conventions or agreements.
- Public and private higher education systems should not be parted in educational activities planning. Equity and interoperability between them must be considered.
- The values of "quality, integrity, accessibility and equity" must be preserved in all higher education institutions and in the regulatory institutions.
- Information gaining's produced by studies and research should be shared with all stakeholders and be open for discussion and consultation.

3.3. Economy and Education

Education is one of the primary areas of interests of international business and trade sector because it has increased its importance as a global activity. The World Trade Organization (WTO) is the most important intergovernmental organization which regulates international business and trade. The General Agreement on Trade in Services (GATS) is a multilateral, legally enforceable agreement covering international trade in services. Education services, including higher education, are one of the 12 broad sectors included in the agreement. Even if it is included in the agenda, it is commonly believed that there is no effective consultation between actors of the trade and the organizations leading public and private higher education institutions.

Under the coordination of WTO, some influential education and training institutions put forward a joint declaration on higher education and the general agreement on trade in services in with respect to

the GATS and trade in education services. The above mentioned associations (AUC, ACE, EUA CHEA, 2001)[1] put forward a declaration.

The aim of this declaration is to improve communications and multilateral information exchanges between all concerned parties, partners and participants and encourage developing agreements concerning cooperation, coordination, and collaboration between higher education institutions in particular on program developments, ensuring qualification and exchange on quality practices. It also calls the parties to enable them to improve their lifelong education system from college education to continuous education systems.

Sustainable Development

Sustainability is the most important issue for any company or organization in the challenging economy of today. To provide that all actors of the economy need continuous transformation to adopt the new conditions as well as the education institutes. Reputation is highly sensitive element to keep the customers' relevancy and protect the institutes against any fluctuation in the economy. Beyond the classical management approach, all institutions require to change their attitudes to respond new expectations of the customers. 21st Century is generally called as "Innovation Era". Innovation is a key element for sustainability of any organization.

United Nations is working for creating a sustainable development for world. UNESCO defined "2030 goals" for sustainable development (SD). SDG Goal 4 is international commitments, and relevant stakeholders must be assisted in providing quality education to equip youth with skills and competencies to take on future challenges and opportunities in society. UNESCO (2020) Goal 4 for sustainable development is now "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. UNESCO (2020a) aims to improve access to quality education on sustainable development at all levels and in all social contexts, to transform society by reorienting education and help people develop knowledge, skills, values, and behaviours needed for sustainable development.

3.4. New Notations in Education

Teaching versus Learning

In the classical education system, "teaching" is the essential way of application in the schools which serves to prepare the students to assume their role in life. But because of the rapid change in the society and business world, people need to learn additional knowledge after the education in schools. In this case, today, teaching is overflowing the boundaries of classical classrooms.

There are very many studies on student learning and teaching relations in literature. Pintrich (1994) compared several taxonomies of learning components and concluded that the common elements were students' knowledge base, their procedural skills, their self-regulation of learning, and their motivation and affect (Vermunt & Verloop, 1999). Sheng-Wen et al (2011) propose that "Instructors are thus encouraged to probe students' learning styles and develop teaching strategies that correspond to the students' needs. Using a teaching format that specifically conforms to a given learning style can substantially increase the quality and quantity of a student's knowledge acquisition.

---

[1] These associations are composed of Association of Universities and Colleges of Canada (AUCC), American Council on Education (ACE), European University Association (EUA), Council for Higher Education Accreditation (CHEA) of United States.

Teaching activity transformed from the schools to real world as lifelong learning. The traditional forms of teaching and learning transfer to the immersive spaces of virtual life. Atkinson (2009) identifies principles of instruction for virtual worlds and recommends strategies for designing instruction in the life outside of school.

IT Technologies increased the availability of more data usage in teaching and learning. It is needed more knowledge on types of data which are beneficial to the educational practices. The amount of data and the kind of data are also critical to meet the new requirements (Huber & Skedsmo, 2009).

Teaching is a pre-structured activity to introduce the principles of a subject. Many people assume that learning activities are triggered directly by teaching activities at the beginning, but it is not the fact. Teaching helps the student to get perception on a definite subject. Learning is a tool to assist the students to have conception on the subject which provides them to use the knowledge they gained.

Independent Learning

Classical instructional methods applied at the universities include in the face-to-face teaching in classrooms by lecturers. Distance education is the method different from the classical methods and is executed outside of the classrooms that mainly takes place in an independent learning situation. In classical education, students come together with the instructor in campus and this environment can create a stimulating effect on them. However, some lectures attended by overcrowded students are sometimes disappointing and bore the students. In these cases, the face to face training advantages of traditional education cannot be exercised. Distance education has advantages over the classical education. (Schuyten et al (1999) state that "However, Distance education sometimes fails when a student's motivation declines or when a student has difficulties in assimilating educational material".

Meyer (2014) has been many studies in integrating the smart technologies into the educational process in the innovation efforts in education. In studies, independent learning in addition to the lifelong learning has provided important inputs and opportunities in defining new teaching techniques such as new training methods, role playing games, using of smart devices. Independent Learning is also associated with other styles of education such as 'personalization', 'student-centred learning' and 'ownership' of learning. Independent learning is frequently discussed in the context of important issues such as student-teacher roles and relationships, and the role of information and communications technology in learning (Meyer et al, 2014).

The study on the benefits of independent learning made by Meyer et al (2014) found following advantages of independent learning as improvement in academic performance, increase in motivation and confidence, increase in the students' awareness about their limitations and their ability to manage them, equip teachers in providing differentiated tasks for students and fostering social inclusion by countering alienation.

In independent learning, participation with others, especially members of the field of practice who are more expert in some areas (perhaps a more experienced district leader), substantially extends the potential for individual development (Leithwood, 2004).

Continuing Professional Development (CPD) is now a part of our life in a rapidly and exponentially changing posture of the world. We are living in disrupted development which requires to adopt new technologies in our profession as well as to support emerging new professions. It is also important for professionals to keep up with technologic developments in the maritime industry and enable themselves to update their knowledge, skills, and competencies to adopt challenging requirements.

4. Discussion

4.1. Requirement for Change

Today, change is inevitable for all organizations because competition requires innovations and improvements. Without change, innovation or development does not have a meaning. This century is facing unpredictable hyper competition and disorder (Holbeche, 2006).

Organizational changes in the business and industry affect all other institutions which are directly related to. As all the other organizations, higher education institutions especially others than state owned ones have to change to stay alive as well. The classical structure of the education institutes is under the pressure of the change of the society and they also try to adapt their organization and modus of operandi.

The change is exciting and fast for all the major establishments because market conditions are changing globally very fast due to technological and institutional developments which provide new rules for how business is to be carried on. No organization can avoid from change.

Today is likely to see ongoing change as organizations attempt to move into the new economy while maintaining their conventional products and markets. Keeping the status quo is not an option (Holbeche, 2006). Education sector also needs to modify their conventional products as well as revising their procedures and processes. Nowadays as the other sectors, education institutions especially universities need to manage their change to survive including adding new interest areas and teaching techniques in their education and training activities.

Sustainability is the most important issue for any company or organization in the challenging economy of today. To provide that all actors of the economy need continuous transformation to adopt the new conditions as well as the education institutes. Reputation is highly sensitive element to keep the customers' relevancy and protect the institutes against any fluctuation in the economy. Beyond the classical management approach, all institutions require to change their attitudes to respond new expectations of the customers. 21st Century is generally called as "Innovation Era". Innovation is a key element for sustainability of any organization.

4.2. New Technologies affecting Education System

The QT Flagship program should be structured in five domains, each of which should be reflected in a call for proposals. Four vertical domains (not necessarily of the same size in terms of allocated resources) address vital application areas of a future knowledge driven industry (See Figure 2) (European Commission, 2017).

- Communication, to guarantee secure data transmission and long-term security for the information society by using quantum resources for communication protocols.
- Computation, to solve problems beyond the reach of current or conceivable classical processors by using programmable quantum machines.
- Simulation, to understand and solve important problems, e.g., chemical processes, the development of new materials, as well as fundamental physical theories, by mapping them onto controlled quantum systems in an analogue or digital way.
- Sensing and metrology, to achieve unprecedented sensitivity, accuracy and resolution in measurement and diagnostics, by coherently manipulating quantum objects.
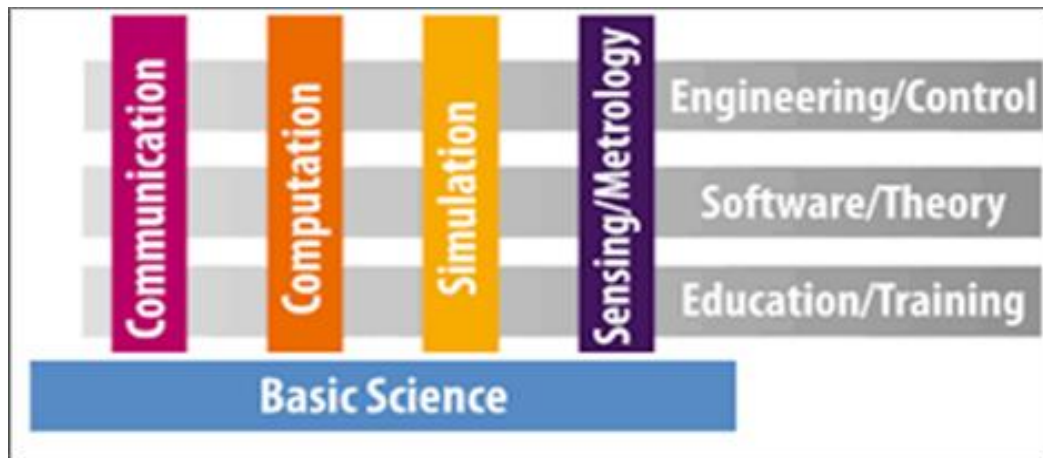
Figure 2. Structure of the Strategic Research Agenda (Source: EC, 2017)

All above mentioned subjects are based and supported with Basic Science. The basic science is necessary to develop novel ideas that can have a major impact on the four application domains ranging from theoretical and experimental fundamental science to proof-of-principle experiments, capable of delivering the concepts, tools, components, materials, methods and processes that will enable the flagship objectives to be realised.

- An integral part of each application domain will be common enabling aspects in the following categories (European Commission, 2017):
- Engineering and Control: Advancing the understanding, design, control, construction and use of new technologies and driving their transition from concepts, theories.
- Software and Theory: Developing quantum algorithms, protocols, and applications, and connecting to tools for control and certification.
- Education and Training: Specific programmes for training a new generation of skilled technicians, engineers, scientists, and application developers in QT and fostering ecosystems for them to work on shared mission-driven technologies and to develop tools and software.

Projects should be positioned within one of the domains and may link to other domains. They should always address Education and Training as well as at least one of the other two enabling aspects.

The data management using information technology became rather important in the digital era. Nowadays 'Introduction to Computers and Programming' courses are delivered at all schools. But this course is not sufficient to understand use of data management. It is strongly believed that a course covering Data Management which covers collection, control and use of data should be added in the programmes.

Integrated Management Systems are now improving as decision support systems to assist the management level for quick decisions in case of emergency. They need to understand concept and usage of decision support system. A course on Decision Support Systems is required to make operators understand specifications and capabilities of such systems.

Automation failures may cause high cost and fatal accidents. Now many operating systems are equipped with highly complicated automation systems and use of automation on work is expected to be emanated. A course on the 'Concept, Capabilities and Limitation of Automation System' is deemed

necessary to mitigate the results of automation failures as well as facilitate the remote-controlled systems.

Quantum Technologies will be leading part of the near future. To perceive and apply QT, our students must be prepared and presented the above mentioned courses.

4.3. New Roles and Missions for Universities

Research in University

Universities are grouped in two categories: applied science universities and research universities. Applied science universities are generally focused on raising qualified manpower for business and industry. The research universities should focus on the research of academic. These universities are generally oriented graduate teaching rather than undergraduate.

A research university may be a state or a privately owned university. A number of the strongest research centres in the USA are in fact private universities, but they do not dominate the research enterprise (EMBO Report, 2007). Whereas state universities are generally funded by states, private universities usually find funds with close cooperation with business, industry, and society. Research efforts to meet the current needs of the industry also allow them to reach the latest technology. The research universities generally specialized on definite subjects and they gain a reputation on them.

University and Society relations

University is existing for the interest and prosperity of the society. There have been many interactions and different kind of relations between university and the society. Many studies have been made on the relationships between government, university and society as well as the related transformations in organization of the university. Industry and business which have to be close relations with the university have been assumed as representatives of the society. Both applied science universities and research universities must follow the science closely to meet the requirements of society. The co-evolution of education and science has brought about adaptations in the university. The expansion of the system of higher education after the Second World War, both in terms of enrolments and in the number of organizations, Meyer et al (2006) suggest asking whether the institutionalized coupling of education and science have loosened. Tuunainen and Kantasalmi (2017) say "In other words, universities, as part of a complex system of higher education, are starting to emphasize the social form of school, simultaneously as science is starting to emphasize its new social forms of collective, industrially oriented knowledge production".

The doctorate and post-doctorate studies are increasing on the social sciences to support society as well as research studies in the fields of technology. There is an increasing requirement for labour force with academic nature in the business and technology. The university must respond to social events and society's needs. The social problems are not only the responsibility of the political administrators, but also, the public responsibility of the universities. Therefore, not only research universities, but also teaching-oriented classical universities carry out studies on the problems of society.

Today, society is tearing its forms. In this postmodern environment, civil society organizations started to stand out in social sensitivity rather than classical public society institutions. Therefore, coordination, cooperation and collaboration activities of universities with non-governmental organizations and civil society organizations have also become important for the society and need special attention.

Autonomy of university

The autonomy of university is highly important to conduct research freely and produce scientific results independently. When it comes to university freedom, more management and financial freedom is understood. In fact, one of the most important elements of university freedom is that the university should be free to prepare its own programs. This is especially important in the age of technology, which is developing rapidly every day. Nowadays this issue is becoming more and more important when professions are reshaping continuously, and new professions emerge (Demirel, 2020).

The institutions responsible for the regulation of higher education in almost all countries are under the control of the state and they constantly want to establish a tighter autonomy on both state and private universities. The most common practice in this field is the standardization of academic programs and academic procedures. With this excuse, the state can intervene in the internal regulations of universities. Increase of government financial control has caused many constrains on autonomy of for universities. Today, standardization has been an inevitable practice. However, in universities were ideas need to be developed freely; standardization is interpreted as 'dressing a tight dress for everyone'. If the university comes under the control of a certain ideology or political group, their work will not be beneficial or even harmful to the society. In democratic societies, "freedom of speech" is essential to the socio-cultural and economic development of a society. In this respect, university autonomy is of vital importance.

4.4. Scenarios for the Future of Education System

To make better estimation for the future trends in higher education, it would be better to work on the different scenarios. OECD CERI (Centre for Educational Research Institute) organized an expert meeting on "University futures and new technologies" and a discussion paper submitted at the end of these meeting mentions about six scenarios for universities. In the Discussion Paper (OECD/CERI, 2008) the six scenarios were introduced.

Scenario 1 (Tradition will continue with some changes): The primary and secondary education is fully controlled by the government. Higher education also covers associated degree studies based on the cradle of intermediate manpower.
Scenario 2 (Entrepreneurial Approach): The education institutes will redesign their system to satisfy both their students and sectors of which they will be deployed. The number of the private education institutions will increase and probably a mixed public-private funding model would be introduced.
Scenario 3 (Education Sector in the Free market): Expansion of the private education institutes is expected in the next decades because of the improvement of liberal economy. In this case the quality assurance and accreditation will become important.
Scenario 4 (Lifelong learning and open education): The business and industry will require competent and flexible manpower which have been equipped with updated and specialized information. The education institutes will assume a new role to assist professional development of the employees supported with distance learning and e-learning.
Scenario 5 (Global network of institutions): Education sector will start to use standard programmes which has been prepared by close cooperation with industry and business. Education institutes will provide education for learners not only at campus but also in distance, using suitable delivery methods
Scenario 6 (Diversity of recognised learning – Disappearance of universities): This is a sophisticated scenario which based on diminishing of the classical higher education sector. People learn throughout their life, at work, at home, for personal and professional motivations, etc. using sophisticated technological devices.

Future expectations affecting these scenarios

The world is rapidly changing. To understand this change it would be better to understand the futurist's opinions for the future.

Frank (2014) creates a figure which contains three curves – one spawns the other. The technology curve (computing power, storage, and bandwidth) is implied. The innovation curve focuses on broad categories of innovation (versus specific innovations like Uber). As these innovations combine, they spawn a disruptive scenario curve (autonomous vehicles, smart homes, etc.). The potential exists for these disruptive scenarios to combine to drive a third curve – a new economic paradigm.

Futurist Leonhard (2016) makes an imagination and says, "Humanity will change more in the next 20 years than in the previous 300 years".

European Commission (2018) has published a Strategy document on Digital Single Market. In this document, it has been stated that "Supporting research and innovation in advanced computing is key to the development of the computing systems of tomorrow, which will go beyond the limitations of today's technology in terms of speed, reliability and efficiency".

António Guterres, Secretary-General of the United Nations introduced a policy statement concerning UN policy for education which reflects new approaches of the international community. Guterres (2020) introduces the following subjects:

- There is an opportunity to reimagine education.
- We can use delivery of quality education as a springboard for the Sustainable Development Goals of UN.
- International community needs investment in digital literacy and infrastructure and more stress on life-long learning and strengthened links between formal and non-formal education.
- Flexible delivery methods using digital technologies and modernized curricula ensuring sustained support for teachers and communities.
- The education is the great equalizer for world more than ever.
- We should take steps to create inclusive, resilient, quality education systems fit for the future.

4.5. Recent Developments in Education

New forms of education

It has been determined that the following issues are needed to effectively achieve the three basic functions (teaching, research, and relations with society) expected from contemporary education institutions.

- Rapid changes in technology dictate to improve the human quality during and after the education stages in classrooms. A continuous education system is required to support independent learning, lifelong learning completing the missing educational and cultural skills of the previous traditional stages of the education periods to adopt the people for new form/order of the world.
- Student affairs departments and admission procedures considering big changes in the students' structure (mid-age, newcomers, professional courses) should be rearranged.
- The close cooperation with business, industry, government, local authorities, and NGOs is necessary to support from all these partners as well as getting support from them.

- The institutes should be specialized on a selected subject to create a sound effect on the business and industry.
- The aim of scientific research should also cover policy production, creation of new procedures and process. The new role of education is not only established links with business and industry but also society.
- More public relations and cultural activity are required to establish a strong link with society using all aspects of the media.
- Relations with non-governmental organizations and civil society organizations are the key elements.

Efficiency of Distance Learning in Emergencies

People are suspicious on the efficiency of distance learning probably not having a real classroom environment and teacher. The face to face education is applied since the emerging of very first civilization and it is not easy to convince the people to effectiveness of distance learning.

In line with the measures against New Coronavirus (COVID-19), Turkish elementary medium high schools, high schools and universities started distance education process as of March 23, 2020 (Bilgi University, 2020) to ensure that its students continue their education in the most efficient way without any disruption. Not only Turkey but also many other countries have applied distance learning to continue their education system. Education institutes improved their distance learning system and achieved sustainability of their education in a very short period. During distant education process, students attended their courses via different learning systems and continued education outside the campus. The lecturers have used distance learning tools effectively.

While countries are at different points in their COVID-19 infection rates, worldwide there are currently more than 1.2 billion children in 186 countries affected by school closures due to the pandemic. With this sudden shift away from the classroom in many parts of the globe, some are wondering whether the adoption of online learning will continue to persist post-pandemic, and how such a shift would impact the worldwide education market (World Economic Forum, 2020).

Real change often takes place in deep crises, and this moment holds the possibility that we will not return to the status quo when things return to "normal". While this crisis has deeply disruptive implications, including for education, it does not have predetermined outcomes (Schleicher, 2020). The governments should react the emergency situations which directly affects social life like pandemics. To achieve that promptly and effectively, the governments make readiness and preparation for emergencies. The Covid-19 pandemics have affected both economy and education and many countries have no preparedness and suffered badly.

OECD published the results of a survey concerning "How the Covid-19 pandemic is changing education". This survey is focused on the continuity of academic learning than to the socio-emotional development of students in emergency. Researchers of this study, Reimers and Schleicher (2020) state that "The reopening [of the school] plans also envisage procuring devices for students and teachers to support e-learning in the future, investing in the creation of effective e-learning platforms and providing professional development to teachers for effective e-learning instruction.

Online learning software applications have made a significant surge in usage since COVID-19 improving online course delivery and examination, virtual tutoring, video conferencing tools etc. A huge number of students and lecturers in the world used distance learning systems and they have adopted it quickly without any problems. It is believed that there could be a significant increase in use of distance

learning after the end of pandemic. The broad use of distance learning will facilitate the application of CPD as being an essential tool for delivery.

4.6. Posture of Education Based on the Existing Developments and Scenarios for the Future

It is understood that both education systems and the education institutions require to change in the next decades because of drastic changes in the business and industry. All the possible evaluations, scenarios and opinions of futurists rapidly dictate changes in the education systems. It is necessary to make changes in different forms and different level to support each scenario. All public and private education regulatory authorities/planners/conductors should determine the most appropriate scenario for themselves and take the measures required by this accepted scenario.

Common issues for all scenarios:
- Flexible rules and structures are necessary to respond continuously changing requirements.
- The education institutes should be managed with a commercial understanding.
- Institutions need to improve their financial system to survive.
- The institutes need to improve their coordination capabilities to achieve cooperation and collaborations with business and industry.
- The customer satisfaction will not be based only the students but also business and industry.
- Creation of a holistic education and training system is required for matching academic and vocational requirements.
- 21st Century is information and innovation era and institutes in particular universities need to produce information and make research for innovation in support of business and industry.
- They should keep in mind that their primary task is to provide qualified manpower in support of the business, industry, government, and local authorities.
- Education is the most important factor to provide sustainable development for the future.
- All we need is now to create a quality education system fit for the future.

EHL (2020) made as study on the new trends in education and defined education ((2020). "5 Trends in Education to Watch out for in 2020". These are:

- A variety of learning tools are now available to support quality education
- Most critical skills to prepare the students for workplace are "thinking, problem-solving, people management, and creativity.
- The content presented to students of the must have excellent visuals and dialogue to hold their attention and as a measure to overcome "students' decreasing attention spans".
- The role of the teachers is now focusing on facilitate the learning rather than teaching.
- Life-long learning is becoming more important to respond requirements of rapid change of technology.

The industrial revolution has changed the nature of work and jobs in astounding ways. The current 4th Industrial Revolution may impact 50 percent of job. Education planners should keep in minds above mentioned new trends to plan for future form of teaching and learning. They should create more attractive delivery methods to keep the attention of Millennials as their attention spans decreasing.

5. Conclusions

People who are responsible to make future in the society, in particular managers should understand and know how to deal with the problems and how to use the opportunities they may meet in managing people

and organizations in contemporary contexts. They need to comprehend the current requirements and new posture of their area of involvement and aware of new approaches applied.

In the light of the evaluations and findings from the discussions on the requirements and availability of different educational forms, the followings are proposed for the education system planners.

The universal truths, principles, and values for education today:

- Education is now an international business. The transfer of services requires both internationally recognized academic and vocational accreditation of all competencies.
- Not only public but also private sector controls the education sector as well as regulates it. This situation hampers autonomy of university and subsequently creates obstacles for research and teaching activities. The barriers against the autonomy of universities should be eliminated.
- Relations with society is now a must for any type of education institute. The education institutes need to combine teaching/learning, research, and relations with society.
- Education institutes need to create a combine system which covers education in the classroom, independent learning, continuous education, and lifelong learning.
- Education system should be ready to respond quickly changing requirements applying management of change techniques. Cooperation, coordination and collaboration with education institutes and business and industry is inevitable as well as NGOs and CCOs.
- Education institutes and business and industry should improve workplace learning to ensure that the graduates are ready to assume their role in the society.
- Universities should be specialized on a definite/selected subject and act as an expert on this subject which leads related sectors.
- Educators should create more attractive delivery methods to keep the attention of Millennials as their attention spans decreasing.
- The universities should be reorganized as applied science universities focused on the provision of qualified manpower and research universities able to create knowledge, information, and innovation
- Quantum Technologies will be leading part of the near future. To perceive and apply QT, our students must prepare and present the lessons such as Computation Communication, Simulation, Sensing and Metrology, to understand and solve important problems, e.g.
- ICT support is vital for education sector. The distance learning systems were used extensively during Coronavirus pandemic and are believed that there could be a significant increase in use of distance learning after the end of pandemic. The broad use of distance learning will facilitate the application of Continuing Professional Development (CPD) as being an essential tool for delivery for near future.
- The education sectors require strong financial management system to survive.

References

[1] Atkinson, T. (2009). Teaching and Learning, TechTrends, May/June 2009, Vol. **53** Number. **3**, p. 30-32.
[2] AUC, ACE, EUA CHEA, (2001). Joint Declaration on Higher Education and the General Agreement on Trade in Services, 28 September 2001 https://eua.eu/component/attachments/attachments.html?task=attachment&id=857 (Retrieved on 09.12.2018)
[3] Bahçeşehir University. (2018). http://www.bahcesehir.k12.tr/tr/egitim/detay/STEM--A/21/81/0 (Retrieved on 09.6.2019)

[4] Bilgi University, (2020. Distance Education at BİLGİ https://www.bilgi.edu.tr/en/uzem/ (Retrieved on 13.05.2020)

[5] Demirel E. (2020). Autonomy versus Standardization for University Academic Programs, Theory and Research in Social and Administrative Sciences, (Ed. O. Kaya), ISPEC ISBN: 978-625-7279-82-6

[6] EHL (Ecole hôtelière de Lausanne). (2020). 5 Trends in Education to Watch out for in 2020https://hospitalityinsights.ehl.edu/2020-education-trends (Retrieved on 13.12.2020)

[7] EMBO Report, (2007.) The future of research universities. Is the model of research-intensive universities still valid at the beginning of the twenty-first century, *Science and Society Interview*, September 2007 **8(9):** 804–810. doi: 10.1038/sj.embor.7401052

[8] Erik P.M. &Vermeulen E.P.M. (2018). Living & Working in the Decentralized World of Tomorrow, Hackernoon https://medium.com/hackernoon/living-working-in-the-decentralized-world-of-tomorrow-23ac3e8e345 (Retrieved on 30.05.2020)

[9] European Commission (2017). Strategy- Digital Single Market- Reports and studies- Digital Single Market, Report / Study, 18 September 2017, Quantum Flagship High-Level expert group publishes the final report, Quantum Technologies Flagship Final Report High-Level Steering Committee 28 June 2017 https://ec.europa.eu/digital-single-market/en/news/quantum-flagship-high-level-expert-group-publishes-final-report (Retrieved on 11 May 2020)

[10] European Commission. (2018). Strategy, Digital Single Market, Policies, "Advanced Computing https://ec.europa.eu/digital-single-market/en/policies/advanced-computing (Retrieved on 22.12.2019)

[11] Frank D. (2014). 'Combinations and Disruption. Reimagining The Future', Journey Through the Looking Glass https://frankdiana.net/2014/08/12/combinations-and-disruption/ (Retrieved on 22.10.2019)

[12] Guterres A. (2020). "The future of education is here", Launch of The Policy Brief: Education During Covid-19 and Beyond, United Nations, https://www.un.org/en/coronavirus/future-education-here (Retrieved on 22.10.2020)

[13] Hart J. (2018) Introduction to Modern Workplace Learning, Modern Workplace Learning Series, Centre for Modern Workplace Learning Centre for Learning & Performance Technologies https://modernworkplacelearning.com/wp-content/uploads/2018/02/MWL2018-Part1-v3-1.pdf (Retrieved on 20.06.2018)

[14] Holbeche L. (2006). Understanding Change, Elsevier Linacre House, Oxford ISBN-13:978-07506-6341-0ISBN-10: 0-7506-6341-3

[15] Huber, S. G. & Skedsmo, G. (2016). Data Use—a Key to Improve Teaching and Learning? *Educational Assessment, Evaluation and Accountability* (2016) **28:1–3** DOI: 10.1007/s11092-016-9239-8

[16] Lessonly (2016). Learning Trends Report 2016-2017 https://www.lessonly.com/.../2016-2017-learning-trends-report (Retrieved on 30.06.2019)

[17] Leonhard G. (2015). Digital Transformation in Ports and Shipping, IAPH Hamburg, 2015 www.futuristgerd.com/2015/06/digital-transformation-in-ports-and-shipping-2030-my-presentation-at-iaph-2015-in-hamburg/ (Retrieved on 12.12.2019)

[18] Leithwood, K., Louis K., Anderson S. & Wahlstrom K. (2004). Review of research; How leadership influences student learning, Learning from Leadership Project, University of Minnesota Center for Applied Research and Educational Improvement, University of Toronto Ontario Institute for Studies in Education

[19] Meyer J. W., Ramirez F., Frank D. J. & Schoffer E. (2006). Higher Education as an Institution. Center on Democracy, Development, and The Rule of Law (CDDRL) Freeman Spogli Institute for International Studies, Oxford https://fsi-live.s3.us-west-1.amazonaws.com/s3fs-public/Meyer_No_57.pdf (Retrieved on 30.06.2020)

[20] Meyer B., Haywood N., Sachdev D. & Faraday S. (2008) What is independent learning and what are the benefits for students? Schools and Families Research Report 051, 2008 ISBN 978 1 84775 239 https://www.associationforpsychologyteachers.com/uploads/4/5/6/6/4566919/independence_learning_lit_review.pdf/Whatisindependentlearningandwhatarethebenefits.pdf (Retrieved on 22.09.2018)

[21] MWL (Modern Work Place Learning). (2020) Modern Workplace Learning 2021, Back to Basics https://www.modernworkplacelearning.com/cild/ (Retrieved on 12.12.2020)

[22] OECD/CERI, (2008): Discussion Paper: Six Scenarios for Universities, OECD/CERI Experts Meeting on "University futures and new technologies http://.oecd.org/edu/ceri/38038292.pdf (Retrieved on 22.06.2018)

[23] Pintrich P. (1994). Continuities and discontinuities: future directions for research in educational psychology, *Educational Psychologist*, **29**, 137–148.

[24] Reimers,F. M. and Schleicher A. (2020). Schooling disrupted, schooling rethought- How the Covid-19 pandemic is changing education. OECD. https://read.oecd-ilibrary.org/view/?ref=133_133390-1rtuknc0hi&title=Schooling-disrupted-schooling-rethought-How-the-Covid-19-pandemic-is-changing-education (Retrieved on 18.12.2020)

[25] Salim I, Michael S. M, Geest Y.V. (2014). Exponential Organizations: Why new organizations are ten times better, faster, and cheaper than yours (and what to do about it), Diversion Books Print ISBN: 978-1-62681-423-3 eBook ISBN: 978-1-62681

[26] Schools and Families Research Report 051, 2008, UK Department for Children, London https://www.gov.uk/government/publications/department-for-children-schools-and-families-departmental-report-2008 (Retrieved on 30.06.2019)

[27] Schleicher A. (2020). The Impact of Covid-19 on Education- Insights from Education at a Glance 2020, OECD https://www.oecd.org/education/the-impact-of-covid-19-on-education-insights-education-at-a-glance-2020.pdf (Retrieved on 12.12.2020)

[28] Schuyten, G., Dekeyser, H., Geominne, K., (1999). Towards an electronic independent learning environment for statistics in higher education, Education and Information Technologies (1999): 409-424, https://link.springer.com/content/pdf/10.1023%2FA%3A1009665630628.pdf (Retrieved on 12.12.2018)

[29] Sheng-Wen, H., Yu-Ruei J., Gwo-Jen H., Nian-Shing, C. (2011). Effects of teaching and learning styles on students' reflection levels for ubiquitous learning, *Computers & Education Volume 57 Issue 1* https://doi.org/10.1016/j.compedu.2011.01.004

[30] Top 100 Tools for Workplace Learning 2017 (2017). Centre for Modern Workplace Learning Centre for Learning & Performance Technologies http://c4lpt.co.uk/top100tools/ (Retrieved on 30.06.2019)

[31] Tuunainen J. & Kantasalmi K. (2017). Advancing Understanding about the Relationship between Science, University, and Society – An Introduction, May 2017, *Science and Technology Studies* **30(2**) doi:10.23987/sts.63513

[32] UNESCO, (1998). World Declaration on Higher Education for the Twenty-First Century: Vision and Action http://www.unesco.org/education/educprog/wche/declaration_eng.htm (Retrieved on 20.06.2018)

[33] UNE SCO (2020). Open Working Group proposal for Sustainable Development Goals https://sustainabledevelopment.un.org/focussdgs.html (Retrieved on 10.12.2020)

[34] UNESCO, (2020a). Education for Sustainable Development https://en.unesco.org/themes/education-sustainable-development (Retrieved on 10.12.2020)

[35] Vermunt J. D. & Verloop N. (1999). Congruence and friction between learning and Teaching Learning and Instruction No: 9, *Learning and Instruction Volume: 9 Issue: 3*

[36] World Economic Forum (2020). The COVID-19 pandemic has changed education forever. This is how. https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/ (Retrieved on 20.05.2020)

[37] WTO (2013). Services: rules for growth and investment https://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm6_e.htm (Retrieved on 20.05.2020)