

The Role of Higher Education in Supporting Innovation and Transformation of the Digital Economy - Finnish Experience as a model -

دور التعليم العالي في دعم الابتكار والتحول الإقتصاد الرقمي
- التجربة الفنلندية نموذجا -

*BENOUNISSA Leila

University of Mascara (Algeria),

l.benounissa@univ-mascara.dz

LAOUFI Hakima

University of Mascara (Algeria),

h.laoufi@univ-mascara.dz

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Abstract :

This study aims to explore the extent to which educational policy, particularly higher education, influences the state's direction in research and development to transition toward a digital economy. In recent decades, the world has witnessed significant changes due to technological and scientific advancements, the widespread use of the internet, and artificial intelligence. This has been achieved by focusing on human capital and educational policies to foster creativity and innovation. Based on this, Finland was chosen as a model for this study due to its remarkable progress in this field. In a very short period, Finland managed to rise from its previous state, experiencing significant development in information and communication technology, innovation, and its rapid transition toward a digital economy.

Keywords: Digital economy; Higher education; Information and communication technology; Finnish experience

JEL classification codes: I23, O33, D83

I- Introduction:

Technological advancements and the various aspects of globalization have led to the emergence of a highly complex and competitive economic environment. In this context, the decision to establish a small business has become a strategically difficult one that requires sufficient guarantees for success. This complexity arises due to the numerous challenges associated with business creation and growth, including technical and administrative issues, as well as external environmental factors.

The field of information and communication technology (ICT) plays a crucial role in economic activities, fostering economic development, job creation, and promoting innovation and renewal. In this regard, developing and enhancing human capital is essential, as it equips entrepreneurs with the necessary knowledge, skills, and expertise to strengthen innovation and ensure the successful realization of projects. Innovation is among the most critical economic drivers that governments rely on to boost economic growth. Many countries provide various incentives and facilities to support innovative entrepreneurs and university graduates in establishing their own businesses. This approach aims to transition students from being job seekers to becoming entrepreneurs and business owners who contribute to job creation.

pressing necessity. Universities are primarily responsible for generating and disseminating knowledge, creativity, and innovation. Governments are working to transform higher education institutions into hubs for entrepreneurial initiatives by establishing university business incubators. These incubators help identify and nurture innovative ideas within the academic environment while supporting entrepreneurs in bringing their projects to fruition.

- Research Problem:

To what extent does a country's educational policy contribute to driving innovation, creativity, and integration into the digital economy?

- Significance of the Study:

Educational institutions have become one of the most essential pillars of societal development across various domains. Their impact extends to social, economic, political, and cultural aspects, as they

provide an environment conducive to preserving and fostering values and ideas that societies seek to reinforce. The study emphasizes:

The importance of investing in human capital, highlighting knowledge as a key factor in economic progress.

A comparative approach to analyzing global institutions engaged in knowledge production, assessing their social and economic environments, and drawing lessons from international experiences.

Encouraging investment in knowledge at the national, regional, and global levels through collaboration with relevant local, regional, and international entities.

- Research Methodology:

To comprehensively address the various aspects of this topic, the descriptive-analytical approach was employed. This method was used to evaluate the educational policies implemented and adopted by different countries to encourage and create added value by fostering innovative institutions that promote creativity and innovation, ultimately facilitating their integration into the digital economy.

As a case study, we examined Finland's pioneering experience in the field of creativity and innovation, given its remarkable success in this domain.

- Many researchers touched on digital transformation, especially in education, because of its outputs and a positive impact on the economy, among these studies is a study (Esquivel, 2024)¹ entitled The transformation of education in the twenty-first century into a digital spread, and the aim of this study was to explore the complex relationship between faculty independence and workload to determine whether the integration of technology has an impact on the practice of faculty tasks, and used in his study a questionnaire as a tool for study

- (J. Multisilta; T. Mattila; K. Lempinen, 2023)² also addressed in a study titled Faculty Expectations for a Digivisio 2030 Joint Project for the Digital Transformation of Higher Education in Finland Study digital transformation in Finland from the perspective of the University of Applied Sciences. In addition, communication with other companies and organizations is an important part of higher education strategies and procedures in this research. It also presents the results of a survey conducted at the University of Applied Sciences in Finland on the attitudes and expectations of faculty

towards the digital transformation project nationwide. (N = 82) The data shows those teachers' expectations and attitudes range from positive to uncertain. Many believe that in the future digital university, it will play a more important role compared to face-to-face learning. The role of technology was not seen as a challenge to their skills, and professors expect more training and teaching methods to emerge when they collaborate with other professors from other universities in Finland.

Study (Görkem Avcı, Maarit Tihinen, 2022)³ entitled Teachers' Experiences in Distance Education Caused by the COVID-19 Pandemic in Finland and Turkey - Digital Transformation in Practice, This study presents the results of the survey on the experiences of Finnish and Turkish professors in distance education caused by the pandemic. The research focused on clarifying how the pandemic is affecting professors' digital skills, the general readiness for distance education as well as the readiness for future distance education. A total of 137 professors from different disciplines participated in the online survey during the 2021-2022 academic year. The results indicated that the pandemic boosted digitalization and that the shift in education as digital skills for teachers and their readiness for distance education improved significantly during the pandemic year in both Finland and Turkey.

-A study (Roksana Ulatowska, Elina Wainio and Marcin Pierzchała, 2023)⁴ entitled Digital Transformation in Human Resource Management to Serve Modern Business in Finland The purpose of this study is to analyze the digital innovations that are being introduced in the field of human resource management of organizations in the modern business of the service sector in Finland and Poland. It also aims to identify the most important factors and trends affecting digital innovations and identify the challenges they generate for human resource management departments. The practical goal is to develop recommendations for executive directors of organizations, policymakers and researchers

1. Concept of Higher Education:

University education refers to the learning process that an individual undergoes after successfully obtaining a high school diploma (baccalaureate). It provides specialized courses based on the chosen or assigned field of study, which is often determined by the student's academic performance. University education takes place within

faculties or higher education institutes, with study durations typically ranging from three to four years. It represents the final stage of formal education⁵.

According to UNESCO, university education consists of post-secondary study or research training programs offered by universities or other recognized higher education institutions that are officially accredited by state authorities⁶.

Ben Ashnou defines higher education as a progressive training process that involves a structured accumulation of knowledge through various academic courses. The aim is to equip students with the ability to partially master a specific scientific or technical field. This training is organized into different programs and teaching methods when necessary⁷.

University education is generally accessible to a select group of students with academic qualifications. Universities, as key institutions of higher education, are often described as communities of scholars dedicated to the pursuit of truth and the improvement of individuals and society.

The naming of higher education institutions varies across countries (e.g., university, college, academy, etc.). However, universities are commonly defined as scientific institutions with a structured organizational framework. Their primary functions include teaching, scientific research, and community service. They consist of various faculties and departments specializing in different fields, offering diverse academic programs at the undergraduate and postgraduate levels, leading to the awarding of academic degrees⁸.

Universities are also recognized as social institutions developed by society with the primary purpose of serving it..⁹

1.1. University Functions:

Each stage of an individual's education has its significance and distinguishing characteristics. Higher education is defined by its specific roles and responsibilities, primarily as the key provider of highly skilled and knowledgeable human capital to society. The outcomes of higher education, whether human resources or scientific advancements, contribute significantly to economic development.

In this regard, we will explore the functions of higher education as outlined by UNESCO during the World Conference held in 1998, which include the following:¹⁰

- **Education and preparation of tires:**

One of the primary functions of higher education is to prepare qualified professionals. Universities serve as institutions responsible for disseminating knowledge and bridging the gap between theoretical and practical learning. They play a crucial role in transforming students from individuals with limited knowledge into highly skilled professionals ready to enter the workforce. Since university graduates are a key input for economic development, their education directly contributes to societal progress¹¹

For higher education to effectively fulfill its educational role, it must move beyond traditional curricula and outdated teaching methods that rely solely on memorization and rote learning. Instead, it should foster critical thinking, reflection, deduction, and research skills to enhance students' intellectual and professional growth.¹²

- **Scientific Research Function:**

It is one of the necessary tasks for higher education institutions, as it is carried out by professors, researchers and graduate students in laboratories equipped with all the tools and equipment required by the research process, and it cannot be separated from higher education. "It is an organized intellectual process carried out by the researcher in order to investigate the facts about a scientific issue that is the subject of research, following scientific research methods with the aim of reaching results valid for generalization that are considered as research results¹³.

All this process is carried out by joint efforts between the professor and the university student together because the production of knowledge and its employment from theory to practice, it is a valuable process that requires the intensification of the efforts of all the educational family, "the common relationship between them makes each of them affect the other and is affected by it, the competent university professor is the one who provides students with a summary of his scientific research and field experiences¹⁴.

Therefore, it becomes one of the functions of higher education to provide an atmosphere capable of stimulating scientific research.

This function is one of the second most important functions of higher education institutions because of its value, as scientific research and knowledge production are measured by the development of societies, because the summary of research and results is considered as the beginning of innovative ideas and projects, after developing, supporting and funding they become innovations, discoveries and inventions that have returns in all respects¹⁵

- **Community**

Service:

Higher education performs the function of community service, as the university in the Middle Ages was more interested in religious sciences and Aristotle's philosophy than economic development, and after the industrial revolution it began to partially adapt to the needs of society, as it began in the 19th century to provide education in disciplines interested in new jobs such as science, engineering, accounting. Today, you study all the disciplines required by the new society, including sociology, business administration, marketing¹⁶.

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Therefore, the cadres graduated from higher education institutions must be compatible with the requirements of the labor market to apply what has been taught and the knowledge gained, thus providing society with a highly efficient human hand to contribute to increasing productivity.

2. **Digital Economy:**

The digital economy consists of two words, the word "economy" and the word "digital", which shows a new type of transaction that uses information and communication technologies, as this economy is characterized by Internet transactions and virtual space for all economic transactions. The digital economy is defined as the type of economy that is based on the use of information and communication technology, which facilitates the flow of information, goods, services and the movement of capital to and from anywhere in the world at any time¹⁷.

The digital economy is dominated by the intensive use of all media, communication, software, products and electronic industries, all of which have led to a change in lifestyle and a

change in the nature of transactions and economic activities. The term digital economy expresses how modern procedures, expertise and technologies are implemented to maintain competitiveness in the rapidly changing world of technology.

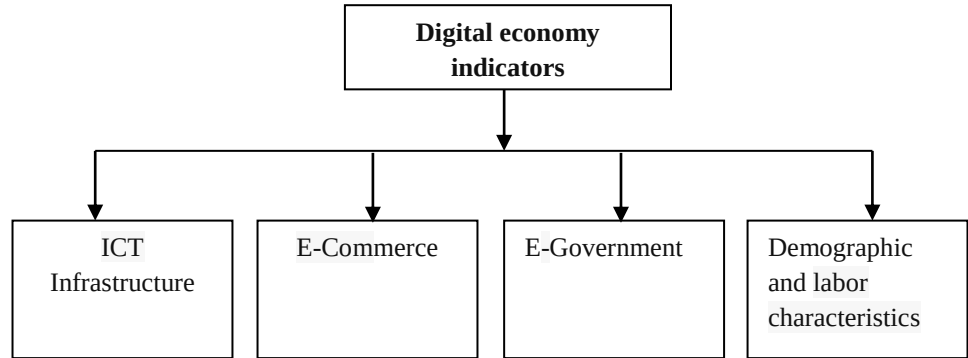
Among the most important characteristics of the digital economy, we mention¹⁸:

- Availability of information to decision makers through databases, especially blockchain
- Information in the digital economy is the basis of power and wealth
- Abolition of borders, restrictions and traditional economic transactions
- The digital economy is based on the level of technological culture of society of all ages
- The main dependence of the Internet in various operations and daily transactions.
- The emergence of e-selling, e-marketing, e-commerce, e-government
- Constantly affected by changes in the information technology sector and communication
- The emergence of digital globalization
- The emergence of digital institutions
- The advent of the Internet of Things.
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2.1 Digital Economy Indicators:

To know the progress of any country in the transition towards a knowledge economy, this transformation must be measured using indicators that are considered as a benchmark related to the level of orientation to information and communication technology in addition to other indicators. The Knowledge Economy Index shows whether the environment is conducive to the dissemination of knowledge that can be used effectively in economic growth. The World Bank has worked to develop the most important indicators that help the international classification in the knowledge economy, and the knowledge economy index depends on four indicators that are considered as pillars of this economy. The following figure illustrates this:

Figure 01: Digital economy indicators



Source: https://ec.europa.eu/commission/presscorner/api/files/document/print/fr/memo_16_385/MEMO_16_385_EN.pdf, last consultation date 18.02.2025

- **ICT infrastructure:** It is a qualitative indicator that expresses the network infrastructure and access to information and communication technology in addition to the percentage of its use by individuals in society, and it can be measured through computers, telephone lines, whether fixed or mobile, fiber optic lines, satellites, wired and wireless networks, in addition to measuring investments and the software industry, and basic information regarding the extent of the Internet and other networks and the degree of congestion in the systems of these networks.
- **E-commerce:** It is also one of the most important basic indicators through which the digital economy can be measured, through the size of its exchanges between the institution and the consumer, and between institutions among themselves
- **E-government:** E-government reflects the level of progress of the state and the extent to which the state applies information and communication technology in its dealings, and its transformation towards the digital economy, although the most important areas of e-government represent the electronic public services provided by the government to citizens in order to improve and accelerate various public services such as health, education, culture and others, and eliminate bureaucracy through the development of digital areas that are predominantly transparent, and the work of e-government is not limited to providing services to individuals

only, but there are several patterns in E-government is from government to government, from government to institutions and vice versa, and from government to individuals and vice versa

- **Demographic and Demographic characteristics:** by measuring the demographic characteristics and labor market characteristics of individuals and employment to know the extent of participation in the digital economy, such as measuring the extent of computer use in school, work and home, and linking it to the results of economic outputs such as salaries and assets, as well as demographic characteristics such as education, employment, gender, race, age and place of residence

3. Finnish experience:

It is one of the most important global experiences for the transition and transformation to the digital economy for the following reasons:

- First, the small area of the country Finland (338.424 km2)
- It has long relied on the agricultural economy.
- The state of the Finnish economy in the early nineties was

in crisis due to the economic recession resulting from the banking crisis, which caused a balance of payments deficit and raised unemployment levels.

Despite all these difficult circumstances that Finland was experiencing, it was able, in a very short time, to rise from the situation it was in in the mid-nineties, where it witnessed a remarkable development in the field of information and communication technology and became one of the first countries in the knowledge economy and the competitiveness and human development index¹⁹.

The table shows Finnish economic indicators before and after integration into the knowledge economy.

Table 01: Indicators of the Finnish economy

Indicators	Before the 1990 move	After digital transformation
Per capita GDP (purchasing power parity)	18 A thousand dollars	57505.51 \$ (2023)
GDP growth rate	%5 -	% 0.40 (2024)
Unemployment rate	% 20	1.70%
Inflation	(2000) % 3	(2024) % 0,7
Share of FDI stock/GDP	% 8.1	%30.5

Share of high-tech industrial exports to total industrial exports	% 8	% 24
Share of goods and services exports to GDP	% 23	% 47
Number of phone users per thousand population	53	%78
Number of Internet users per thousand inhabitants	4	%95

Source: Dr. Fahd bin Hassan Al-Omran, Dr. Abdullah bin Muhammad Al-Mansour Al-Humaidan, Dr. Faisal bin Abdullah Al-Bowardi, Dr. Al-Obaid Al-Hussein Al-Obaid, Edited by (2009), Investment in Human Capital and the Knowledge Economy, Riyadh Economic Forum Towards Sustainable Economic Development, Fourth Session, p. 107.

• **3.1 Rapid Progress Factors:**

One of the most important factors that helped this rapid progress in the economy²⁰ :

- **Increased spending in research, innovation and development:**

Spending on research, innovation and development increased from 1.5 percent of GDP in the late seventies to 3.5 percent of GDP in 2009.

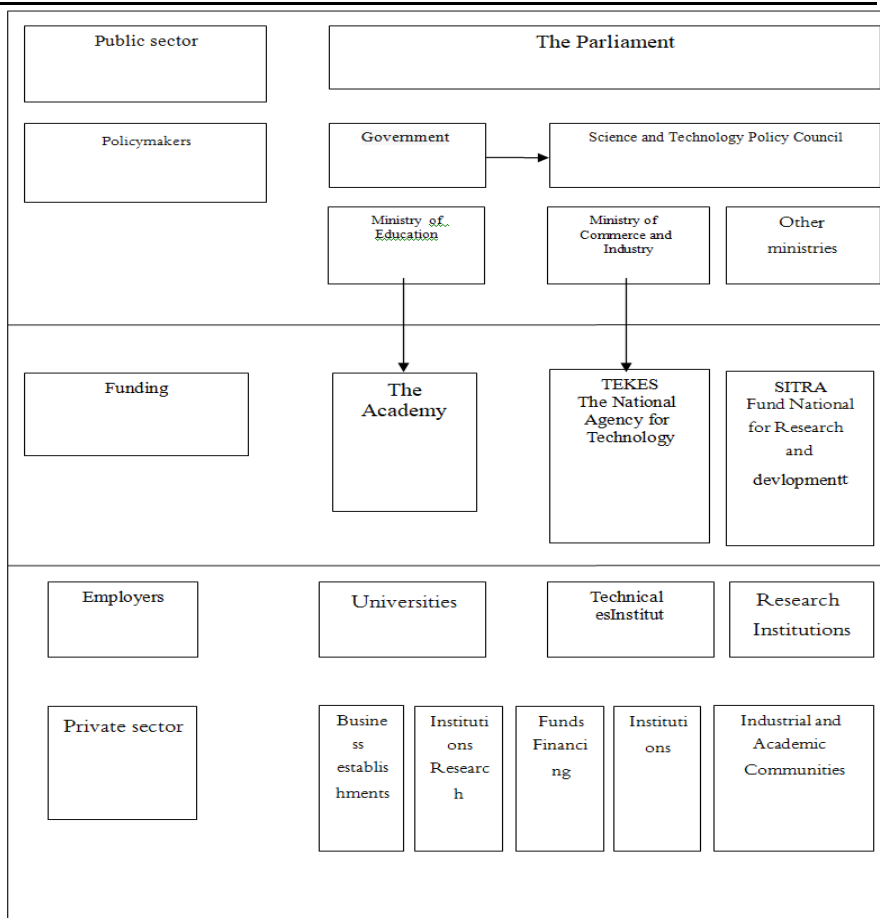
951M Finland spent €951 million invested in Finnish startups in 2020

This increase in the level of spending has facilitated the research and innovation development programs and innovative plans set by the government, and therefore the factor of increasing spending in the field of research, innovation and development is one of the most important factors

Finland has been able to succeed in the development plans, represented in the preparation of a national strategy for innovation and industry, adopted by Parliament and the government apparatus and approved by officials, and established bodies, agencies and higher councils specialized in developing policies for science, innovation and technology, such as the Council for Education and Technology, and the Finnish Academy for Scientific Research.²¹

The following figure shows the organizational structure of innovative activity in Finland

Figure 02: Organizational structure of innovative activity in Finland



Source : Dahlman, C. J., Routti, J., & Ylä-Anttila, P. (2006). Finland as a knowledge economy: Elements of success and lessons learned.

Private institutions have worked to finance research and innovation activity next to the government sector, especially as they are aware of the requirements of the market and private industries that help in the development process and increase competition between sectors, and have adopted policies to encourage innovation and worked to develop agreements linking institutions, universities and industrial companies to make the process integrated.

We also know that research and innovation are at the hands of an elite of human capital that obtains special education or high features and qualities, so it has become necessary to work on developing the educational system in all stages because it works to form this elite of university graduates.

One of its development policies is also to build bridges between

research, economics and politics, liberalize foreign trade, and this is to encourage foreign investment, especially in the communications and electronics sector, because its first goal is to transfer and generate knowledge and create creativity and technological innovation locally and not imported from other countries²².

Total investments in ICT services (% of GDP) amounted to 1.69% out of 30 countries in 2022, where the average of countries was 2.96%

Finland's huge leap in electronics due to "skilled and trained labor, strong infrastructure, a well-developed educational system and an abundance of foreign capital to finance the expansion of these industries"²³

In addition, what is known as business incubators or commercial incubators, which are a strong catalyst for the process of innovation and creativity, "and incubators include specialized industries and technology incubators that focus their efforts on incubating modern individual innovations." ²⁴

They are support programs dedicated to the development and success of companies by supporting them financially by the incubator management, especially start-ups in the establishment, helping them to choose customers and provide services. In a study conducted by some researchers on incubators, they found that start-ups incubated by business incubators have a chance of success and continuity in the market by almost 87%.

3.2 Finnish policy on education for digital transformation:

Finland has worked to pay attention to education under the slogans of "education for all, and high quality in education" for this it has developed everything that can be developed from its curricula in all educational stages and the introduction of modern technologies even in primary teaching and allocated a greater opportunity, especially for technical learning that is in line with its developmental requirements in this period. To develop its educational system significantly, which made it among the leading countries in the digital field, where its main goal was:

- Providing equal opportunities for all citizens through the right to equality in education through: free education and for all levels, every pupil and student has the right to educational support, education for people with special needs is provided, in addition to shedding light on lifelong learning

- **The education system is based on trust and responsibility:** most types of education are funded by the government, and the local administration and educational institutions play a fundamental role with great educational independence at all levels, Quality assurance relies on guidance rather than control.

- **Early childhood education and basic education as part of lifelong learning:** Early childhood education works because it supports the development and learning of children, providing basic education within a single structure because the school year is the same everywhere but schedules vary by place, national core curricula allow room for local differences, and continuous evaluation is part of daily educational work.

- **Highly educated teaching staff:** the most common pre-employment requirement in Finland is to obtain a master's degree, and education leaders must have teaching qualifications, and encourage the continuation of teacher education in addition to encouraging individuals to read quickly. Through all this, the type of economy has changed and turned into a digital economy, and we will address the most important sub-indicators in the digital economy

3.3 The reality of the digital economy in Finland due to its educational policy

The Finnish government is working to develop its economy in order to obtain international leadership in the digital economy, and this is what the partnership between the public and private sectors has achieved by adopting a new project called "Real Time Economy" aimed at conducting digital trade exchanges.

According to the OECD Digital Government Index, Finland ranked first where

Digital government is a key indicator for transforming government procedures and services in ways that improve public sector responsiveness. The OECD Digital Government Index measures the government of digital countries by assessing the inclusiveness of existing strategies and initiatives to leverage data and technology. Finland ranked 12th in 2024 out of 67 countries with 83.57 points and fell four places compared to 2023. Through the following statistics, we discussed some sub-indicators in Finland

▪ ICT Infrastructure:

- Fixed broadband subscriptions per 100 population for 2022 were 34.4% out of 38 countries and the average was 35.4%

- The median consumption of information industry products as a percentage of the total intermediate consumption in 2018 amounted to 9.57% out of 38 countries compared to the average of 7.11%
- Active mobile broadband subscriptions per 100 population in 2023 was 159.9 out of 38 countries The country average was 117.9
- Startups (established a maximum of two years ago) in the information industry as a percentage of all companies for the year 2020 out of 29 countries, Finland was 26.9% and the average was 24.6%
- The monthly mobile data usage index per mobile broadband subscriber in 2022 was 40.1 GB out of 38 countries with an average of 14.1 GB
- Internet users as a percentage of individuals in 2023 reached 97.7% out of 33 countries with an average of 92.3%

▪ **E-commerce:**

- Services provided digitally as a percentage of commercial services in 2020 out of 38 countries
- The value added of industrial exports with heavy use of digital services (% of the total value of industrial exports) for the year 2018 was 25% out of 38 countries, where the average of countries was 25.5%
- ICT goods and services as a proportion of international trade in 2022 Finland accounted for 9.24% out of 37 countries, with an average of 7.67%
- The percentage of companies carrying out cross-border e-commerce in 2022 was 29.2% out of 26 countries, with an average of 40%
- The percentage of companies with an Internet presence in 2022 is 96.1% out of 31 countries, with an average of 78%
- The percentage of companies buying cloud services in 2021 Finland was 75.3% out of 31 countries, the average of 44.8%

▪ **E-Government:**

- Digital Government Index for 2023 reached 0.64% out of 33 countries, where the average of countries reached 0.6%
- Flexibility of procedures regulating digital services for the year 2022 was 0.12 out of 38 countries The average country index was 0.14
- Health data sharing intensity for 2020 was 100% compared to 22 countries where the average was 65.2%
- E-waste in 2022 amounted to 5.13 kg out of 37 countries and the

average was 9,149 kg

- The contribution of digital sectors to value added growth in 2018 was 12.9% out of 28 countries with an average of 51.2%

- Percentage of risk investments in the ICT sector (% of GDP) in 2023 is 0.039% out of 26 with an average of 0.104%

- The percentage of individuals using the Internet to deal with e-government for the year 2022 reached 91.1% out of 33 countries, where the average of countries reached 61.9%

- The percentage of innovations in the field of communications and information technology patented from 2017 to 2022 reached 44.6% out of 31 countries, with an average of 19.4%

- The percentage of employment in sectors with heavy use of digital services in 2018 was 48.31% out of 38 countries, where the average was 48%.

▪ **Demographic and labor characteristics:**

- The disparity in Internet use between men and women in 2023 out of 35 countries was (-0.03PP), where the average of countries was 0.26 PP, knowing that (-PP are men < women and vice versa)

- Disparity in broadband use between households living in cities and households living in rural areas for the year 2023 out of 30 countries, Finland was 2.7 PP compared to the average of 4.51 PP, knowing that (PP is rural < cities)

- Percentage of students with the best in science and mathematics aged between

- The percentage of recent university students graduated from science, technology, engineering and mathematics disciplines out of the total fresh graduates in 2021 was 27.9% out of 37 countries and the average was 23.7%

Conclusion

Most countries are seeking to achieve this goal, by underlining a number of policies and programs to raise and improve productive performance in order to reach rates that exceed the rates of growth of their population, and also to form an infrastructure that helps integration into this economy by paying attention to its indicators, so education at all levels has become one of the most important goals that each country seeks to raise to the highest levels, in addition to opening the way for foreign investments because they bring a large amount of technologies modern, and opens the way for development, creativity and innovation. All this helps in integrating into the

competitive environment experienced by all countries in order to reach the first ranks in the world to integrate into new modern technologies and catch up with civilization.

Through this study, we have shown the most important strengths of Finnish digital transformation and the impact of its educational policy in this qualitative leap and we hope that its features will be applied to Algeria and we take as a model for application as well, we can note the extent to which it is necessary to search for social indicators (not only environmental and physical indicators) to estimate the emergence of the digital society, and these indicators include economic and social demography, indicators of lifelong learning and training, living standards and lifestyle indicators, cultural indicators, indicators of social inequality, indicators Technology penetration, indicators of Internet penetration and time usage.

References

- ¹ Esquivel, G. (Ed.). (2024). *Design Technology and Digital Production: An Architecture Anthology*. Taylor & Francis.
- ² Multisilta, J., Mattila, T., & Lempinen, K. (2023, May). Teachers' expectations for Digivisio 2030—a joint higher education digital transformation project in Finland. In *2023 46th MIPRO ICT and Electronics Convention (MIPRO)* (pp. 877-881). IEEE
- ³ Avci, G., & Tihinen, M. (2022). Teachers' experiences of distance education triggered by COVID-19 in Finland and Turkey-digital transformation in practice.
- ⁴ Ulatowska, R., Wainio, E., & Pierzchała, M. (2023). Digital transformation in HRM of the modern business service sector in Finland and Poland. *Journal of Organizational Change Management*, 36(7), 1180-1192.
- ⁵ International Arabic Encyclopedia, (1999), Encyclopedia Business Foundation for Publishing and Distribution, Riyadh, Saudi Arabia, p. 25.
- ⁶ UNESCO. (1998) Conférence mondiale sur l'enseignement supérieur de clarification mondiale sur l'enseignement supérieur pour le 21ème siècle: vision et action. Paris .p1.
- ⁷ Ben Achenhou Mourad, (1981), Towards the University of Algiers, translated by Aida Adib Baya, Diwan of University Presses, Algeria. P8.
- ⁸ Malihan Moidhi Al-Thubaiti, (2000), Universities, their origins, concept, and functions: a descriptive and analytical study, Educational Journal (Kuwait), No. 54, p. 214
- ⁹ Mahmoud Ahmed Shawq, Muhammad Malik Muhammad Saeed, (1995), "Evaluating the Efforts of Islamic Universities, Towards Community Service and Continuing Education: A Comparative Study", Research Paper Introduction to University Performance, Efficiency, Effectiveness and the Future, The Second Annual National Conference of the University Higher Education Development Center, Ain Shams University, p. 149
- ¹⁰ UNESCO. (1998). Op. Cit . PP 1-5.

- ¹¹ Gharbi Ali, Salatnia Belkacem, Qira Ismail, (2002), Human Resources Development, Dar El Hoda, Algeria, p 218
- Nidaa Mahmoud Farhoud, (2002) The Comprehensive Self-Assessment of the Performance of Universities: An Introduction to Development, Journal of Al-Quds Open University for Research and Studies, First Issue, October 2002, p. 277
- ¹² Nidaa Mahmoud Farhoud, (2002) The Comprehensive Self-Assessment of the Performance of Universities: An Introduction to Development, Journal of Al-Quds Open University for Research and Studies, First Issue, October 2002, p. 277
- ¹³ Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. Proceedings of the National academy of Sciences of the United States of America, 102(46), 16569-16572. p1
- Al-Abadi Hashem Fawzi, (2008), University Education Administration, A Modern Concept in Contemporary Administrative Thought, Al-Warraq Foundation for Publishing and Distribution, Jordan. p. 554.
- ¹⁴ Al-Abadi Hashem Fawzi, (2008), University Education Administration, A Modern Concept in Contemporary Administrative Thought, Al-Warraq Foundation for Publishing and Distribution, Jordan. p. 554
- Bouhafs Mbarki, (2001), The Emerging University Functions between Ambition and Reality: The Algerian University as a Model, The Arab Forum: Education in the Arab World and Facing Challenges, Part 1 Oran: Dar Al-Gharb for Publishing and Distribution, 2002, p. 254
- ¹⁵ Bouhafs Mbarki, (2001), The Emerging University Functions between Ambition and Reality: The Algerian University as a Model, The Arab Forum: Education in the Arab World and Facing Challenges, Part 1 Oran: Dar Al-Gharb for Publishing and Distribution, 2002, p. 254
- ¹⁶ Altbach, D. P. G. (2007). Globalization and the university: Realities in an unequal world. In International handbook of higher education. Springer Netherlands. Pp. 121-139.
- ¹⁷ Hussein Alami (2013), The Role of ICT Investment in Achieving Sustainable Development, Master of Business Administration and Sustainable Development, University of Constantine, p.4
- ¹⁸ Jaafar Hassan Jassim (2008), Introduction to the Digital Economy, 1st Edition, Dar Al-Bedaya Jordan, p 93
- ¹⁹ Dahlman, C. J., Routti, J., & Ylä-Anttila, P. (2005). Finland as a knowledge economy. Elements of Success and Lessons Learned. The World Bank. P03.
- ²⁰ Dahlman, C. J., Routti, J., & Ylä-Anttila, P. (2005). Op. Cit. P03.
- ²¹ Dr. Fahad bin Hassan Al-Omran, Dr. Abdullah bin Muhammad Al-Mansour Al-Humaidan, Dr. Faisal bin Abdullah Al-Bowardi, Dr. Al-Obaid Al-Hussein Al-Obaid (2009), Investment in Human Capital and the Knowledge Economy, Riyadh Economic Forum Towards Sustainable Economic Development, Fourth Session, p. 107
- ²² Dahlman, C. J., Routti, J., & Ylä-Anttila, P. (2005). Op. Cit. P03.
- ²³ Dr. Fahd bin Hassan Al-Omran, et al., (2009), Op. Cit, p. 108
- ²⁴ Prof. Osama bin Sadiq Tayeb, (2006), Towards a Knowledge Society, Third Edition Business Incubators, Series Published by the Institute of Research and Consulting, King Abdulaziz University, Jeddah, Saudi Arabia, p. 25.
- ²¹ Molnar, L. A. (1997). Business incubation works. N. Wiley (Ed.). NBIA Publ.