ESCALATE

TRAINING MATERIAL

LABOUR MARKET AND NEW SECTORAL RESPONSES TO DIGITALIZATION

Co-funded by the Erasmus+ Programme of the European Union

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Labour Market and New Sectoral Responses to Digitalization

This material aims to help university leaders/responsible, educators/teachers and learners, labour market practitioners and analysts to forecast and foresight around the impact of digitalization and its likely impact on the educational process. The materials will be developed to embrace new concepts and principles resulting directly from digitalization.

Learning Objectives

- To better understand how digitalisation and AI are affecting the labour market and word of work
- To recognise what tools and techniques exist to help understand how the labour market is changing
- To understand how different tools and approaches to labour market monitoring can be used in different circumstances and which fit best to your need
- To understand where to go to identify changes within sectoral labour markets
- To explore examples of sectoral responses and why they have happened and what they offer in terms of lessons

Unit 1: The impacts of digitalization on the labour market and key sectors

Module 4: LABOUR MARKET AND NEW SECTORAL RESPONSES TO DIGITALIZATION

1. **The impacts of digitalization on the labour market and key sectors**
2. Labour market monitoring and available tools
3. Policy responses to digitalisation

The objectives of this Unit:

- To help you better understand how digitalisation is affecting the labour market and world of work
- To look in detail at the kind of jobs and sectors that are undergoing change
- To help you appreciate the need to change the way we work and the way we learn

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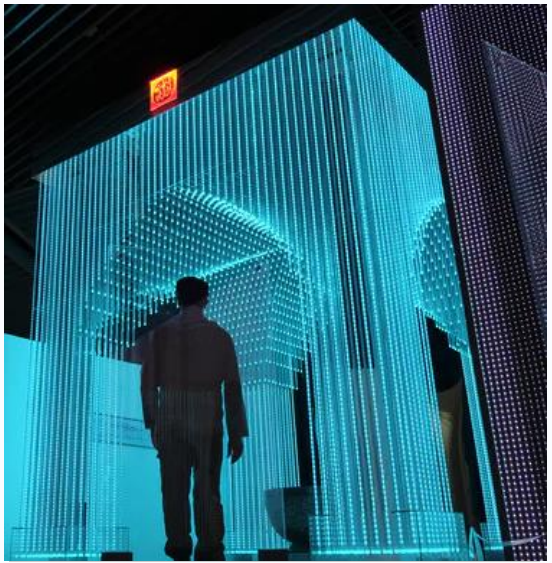
1.1. Digital technologies and society

- Digital transformation is generating a fierce debate among policy-makers, economists and industry leaders
- Impact will lead to changes in people's routine, relationships and behaviour
- This will change the behaviour of our education markets
- Jobs, wages, inequality, health, resource efficiency and security will be impacted
- All sectors have started to use digital advances for decision making, mobility, social media and other smart devices incorporated into their daily routines
- Job displacement has largely been countered with job creation some sectors
- Digital technologies have revolutionised the way people can work
- Retraining is needed to acquire the skills to access these new or modified roles

1.2. Evidence of impact on the labour market in Europe

Digital skills shortage and evidence from across Europe

- EU firms lag behind the US in adopting digital technologies[3]
- 15% of adults in Europe lack basic digital skills
- High skilled workers have tended to benefit more
- Skill shortages are more acute in emerging professions
- Rise in interest in encryption and increase in the number of firms expecting to adopt non-humanoid robots and AI
- The UK is already experiencing this skills shortage.
- In Germany, 38% of SMEs surveyed in 2020 reported a lack of IT skills
- In Romania, only 22 percent of companies use business software for sharing electronic information
- In Spain, only 20% of income currently comes from digital products and services.
- In Italy three out of ten people do not use the internet regularly and more than half of the population does not have basic digital skills.



Source: [1, 2, 4, 5]

1.3. Predictions of future impact on the labour market

- The world of work is changing in response to technological progress, globalisation and ageing populations
- New organisational business models and worker preferences are contributing to the emergence of new forms of work.[7]
- 14% of jobs across the OECD risk being automated and 32% are expected to undergo substantial changes[7]
- Despite anxiety about potential job destruction, a sharp decline in overall employment seems unlikely
- In its 2018 report the World Economic Forum projected nearly 75 million jobs may be displaced, and 133 million new roles will emerge

Source: [7, 8]

1.3. Predictions of future impact on the labour markets

Changing roles and professions

- Roles growing in demand:
  - Data Analysts and Scientists
  - AI and Machine Learning Specialists
  - Robotics Engineers
  - Software and Application developers
  - Digital Transformation Specialists
  - Information Security Analysts
- Emerging professions reflect increasing demand for new products and services, which are driving greater demand for green economy jobs

Source: [2, 5]

1.3. Predictions of future impact on the labour markets

Changing roles

- Human interaction is required in the new economy.
- Expansion demand anticipated for all high-skill occupational groups
  - Biggest demands expected in caring personal service occupations
- Categories experiencing the highest growth due to automation include:
  - Healthcare providers; engineers, scientists and analysts; technology specialists; managers and executives; educators and people in creative industries
- Global teams will boost demand for virtual-collaboration skills
- Leadership and transdisciplinary skills will be in demand
- Demand for physical skills will decline

Source: [2, 11, 12]

1.3. Predictions of future impact on the labour markets

The value of jobs

- Automation will also alter the value of jobs.
- By 2025 about 48% of all job opportunities in Europe will require tertiary-level qualifications and about 85% of all jobs will need basic digital skills
- There will be a premium on workers with problem solving, creativity, leadership, empathy and design skills.
- Workers will need to retrain and upskill

Source: [13]

1.3. Predictions of future impact on the labour markets

Training for the Future of Work

- 84% of employers are set to rapidly digitalize working processes
- 44% of workforce expected to operate remotely
- One-third of all employers expect to create a sense of community, connection and belonging among employees through digital tools
- We will need to modernise our education and training systems and invest more in digital capital infrastructure
- Employers will need to develop inclusive workforce strategies for skills development
- Education needs to target more technical, creative and entrepreneurial skills
- Analytical and interpersonal skills need to be embedded in learning regardless of 'vocational' or 'academic' routes.

Source: [1,2,9]

1.3. Predictions of future impact on the labour markets

Impact of COVID 19 (i)

- New digital skills have become essential skills to enable homeworking.
- Remote work may catalyse transformation of the wider work landscape in positive ways:
  - Remote working is likely lead to more ‘flexible’ work arrangements.
  - It can support healthy working practices
  - Technology has enabled a range of tasks to be conducted remotely
  - Human management and training is still needed
  - Employers and employees are keen to retain the benefits encountered during lockdown

Source: [14]

1.3. Predictions of future impact on the labour markets

Impact of COVID 19 (ii)

- COVID-19 and digitalisation are creating ‘double-disruption’ for workers
- Workers may not have the skills needed to find new employment
- Highest risk for job disruption is the low-skilled, in informal economy, self-employed and the vulnerable groups such as ‘youth’
- We need to invest more in skills training: re-skilling, up-skilling, adult training, and online skills training
- Online learning and training looks different for those in employment and those who are unemployed.
- Employed interested in personal development courses
- Unemployed want to learn digital skills
- Public sector needs to provide stronger support for reskilling and upskilling for at-risk or displaced workers.

Source: [2, 4]

Did you know...

Impact of COVID and Digitalisation

There is currently great uncertainty, with concerns also about its impact on wages and working conditions.

Current estimates of global job losses due to digitalization range as high as 2 billion by 2030 (World Economic Forum).

These are exacerbated by the disruption related to COVID-19.

1.4. Evidence of impacts on selected European sectors

- Level of digitalisation is associated with the sector and impacts and responses vary
- Highly digitalized establishments are most common in financial services and least common in construction.
- Those with high computer use but limited use of other digital technology are also most common in financial services and least common in transport.
- Robots and other digital technology found most in manufacturing industry and least in financial services.

Source: [5]

1.4. Evidence of impacts on selected European sectors

Sectors most impacted by digitalisation

The following sectors have led the business world in digital growth:

- Retail - online retail platforms offer convenience
- Financial Services – spends on information and communications technology
- Professional Services - benefits from automating products and processes
- Transportation - Vehicle automation
- Telecommunications and Media - first to adopt new digital tools
- Publishing - Technology disruptive force

Source: [15]

1.5. Predictions of future impact on selected European sectors

Training and reskilling

- There will be winners and losers.
- AI may be used for efficiency purposes rather than job creation.
- ICT, telecoms, healthcare and education services
  - Digitalisation and AI is likely to create more jobs[17]
- Construction, travel-tourism, manufacturing and transportation
  - Digitalisation and AI is likely to mean fewer workers.[5]

On average around 40% of workers will require reskilling of six months or less. This will be

- Higher in the Consumer industry and in the Health and Healthcare industry
- Lower in the Financial Services and the Energy sectors

Source: [2, 5, 17,18]

Key takeaways

- The world of work is changing. Employers and education policymakers anticipate a shift in the skills that HE students acquire.
- Digital technologies have a huge impact on society.
- As digitalization disrupts society, concern is growing about impact on jobs, wages, inequality, health, resource efficiency and security.
- While there are new employment opportunities, digital technologies have contributed to the decline in traditional manufacturing jobs.
- Job displacement has largely been countered with job creation in the software sector.
- Retraining is necessary to acquire the skills needed to access the new roles.

Reflection

- Think about the context of your own university.
- Reflect on the kinds of roles that your students will be gaining upon graduation and what kinds of support they may need to be sure to be digitally ready for work.
- As an institution do you understand the emerging digital world of work well enough?
- If not… how could you learn more?

Unit 2: The impacts of digitalization on the labour market and key sectors

Module 4: LABOUR MARKET AND NEW SECTORAL RESPONSES TO DIGITALI

1. The impacts of digitalization on the labour market and key sectors
2. **Labour market monitoring and available tools**
3. Policy responses to digitalisation

The objectives of this Unit:

- This UNIT looks at practical ways that universities can understand the impact of digitalisation on the labour market.
- It examines the tools that are available to help them understand skills need now and in the future.

Contents

2.1. Overview of LMI and its purpose, and potential relevance to digitalisation

Labour market information (LMI):

- provides information about the workplace and employment
- identifies what occupations exist, where opportunities are increasing or decreasing, what qualifications are required to take up an occupation, how one can find a job, change job or progress in a career
- provides data required for a labour market assessment e.g. skills shortages and gaps, employer investment in skills, and current and forecast occupational and sectoral employment levels and trends
- provides insights into key drivers, trends and issues affecting the skills market and sector interventions required to adapt to the future of work

2.1. Overview of LMI and its purpose, and potential relevance to digitalisation

The importance of LMI

- High quality LMI is vital for a healthy, well-functioning economy
- The role of LMI is changing.
- LMI plays an important role in identifying future workforce and skills demands.
- Digitalisation is making changes to the labour market which is making it difficult for anyone to predict with certainty what types of work will remain, and what new work will emerge.
- LMI plays an active part in the establishment of evidence-based policy and the strategy-making process
- High quality LMI is key to governments in most countries
- LMI helps establish evidence-based policy and strategy and in the design of training and labour market engagement strategies
- LMI products can help prepare businesses, individuals, public authorities and HE providers to make informed choices and to focus efforts on emerging occupations and industries to:
  - identify the best offer on training and education;
  - check out trends in a particular sector or geography;
  - anticipate the skills needed in the future; or
  - match the requirements of the labour market in curriculum development and strategic planning.

Source: [1] http://www.regionallabourmarketmonitoring.net/TOOLKIT/LAUNCH.html

2.1. Overview of LMI and its purpose, and potential relevance to digitalisation

Forecasting and fore-sighting tools

- Support decisions which involve long lead-in times, such as education and training, & long-term labour market planning
- Inform decision-makers and stakeholders about likely future outcomes and their probable consequences
- Differ in the way they are implemented, their input requirements and in the types of outputs that they generate

Fore-sighting

- Uses a range of methodologies e.g. scanning for emerging changes, analysing megatrends
- Strategic foresight does not attempt to offer a definitive answer, and is one of the best tools to support open policy making

Forecasting

- Makes predictions about the future, based on past and present data and the analysis of trends
- Quantitative skills forecasts offer a consistent and detailed picture of future developments by sector, occupation, qualification or skills
- Both qualitative and quantitative elements can be mixed to develop a skills anticipation model or method that is suitable for a country's or region's requirements

Source: [1] http://www.regionallabourmarketmonitoring.net/TOOLKIT/LAUNCH.html

2.1. Overview of LMI and its purpose, and potential relevance to digitalisation

Different LMI tools

There are two main types of information that can be gained from LMI research:

1. Quantitative
   - e.g. population or education statistics, labour force survey or employer survey data, projections of economic and occupational growth, etc.
2. Qualitative
   - Usually extracted from in-depth interviews and focus groups or other analytical tools.
   - Tends to be richer and more detailed than quantitative information, but it cannot be considered to be as statistically representative.

2.2. Exploration of international monitoring, forecasting and fore-sighting tools

In this section we describe a number of Tools currently available for you to use in your own geography or to explore for good practice. We have selected:

1. Skills Panorama
2. CEDEFOP Skills Forecast
3. Skills Ovate
4. Warwick Institute IER
5. European Data Portal

BREXIT NOTE – the EU elements no longer include the UK. Therefore we have included UK focussed ones such as Warwick Institute IER - Working Futures.

2.3. Sectoral Tools

- Sector studies are an example of qualitative approaches to anticipating skill needs.
- National Tools often allow sectoral analysis
- EU supported Sector Skills Councils are potential resources for larger sectoral trends
- LMI tools can be used to anticipate trends within sectors, and indeed individual occupations.
- Web scraping tools like Skills-Ovate and Skills Insight from Burning Glass can be used to interrogate sectoral data

Example: Australia's Industry Skills Forecast

2.4. Exploration of what LMI universities use and why

Globally, Government and industry leaders are challenging Universities to teach the skills needed by employers and to achieve better graduate employment outcomes

LMI is crucial to understanding what the labour market needs and the tools explored in this course will help ensure these new priorities are met.

Universities use LMI for a variety of reasons

- To establish the skills needed within the workplace
- As part of curriculum development and curriculum planning
- As part of planning non-curricular support such as entrepreneurship and soft skills development
- As part of their recruitment activities and Human Resource planning
- To research many themes around the world of work including:

Future of Work; Economics; Social Policy; Employment and Unemployment Policy and Programmes; Social Partnerships

Examples: LMI in UK Universities, LMI in UK Universities, LMI in UK Universities.

Key takeaways

- Labour market information (LMI) is any quantitative or qualitative data about the nature and operation of the labour market.
- LMI tells you about the workplace or labour market and describes the condition of the labour market, past and present, as well as future projections
- LMI provides analytical insights into the key drivers, trends and issues affecting the skills market and the sector interventions required to adapt to the future world of work.
- Currently, labour market analysts produce a wealth of robust data and high quality analysis on employment and skills issues across the countries and regions.
- Numerous tools are available to meet the different needs, and can be used to support Universities.

Reflection

- In the context of your own institution - find out what kind of LMI is used, by whom and for what purpose.
- Are they missing out on available LMI?
- Are there examples from this course that may help identify what else could be available to help your university?
- If some LMI is not available – what is it and who may have it (regional government, survey companies, employers etc.)?

Unit 3: Policy Responses to Digitalisation

Module 4: LABOUR MARKET AND NEW SECTORAL RESPONSES TO DIGITALIZATION

1. The impacts of digitalization on the labour market and key sectors
2. Labour market monitoring and available tools
3. **Policy responses to digitalisation**

The objectives of this Unit:

- This unit looks at responses to digitalisation at European and National levels.
- It also explores potential University responses to the impacts of digitalisation.
- Finally it makes Recommendations for both universities and Higher Education policymakers - to better utilise LMI and LMI Tools to help build on new opportunities.

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3.1. The European Response

- European policymakers need to address structural barriers to investment in digitalisation
- The EU's "Digital Education Action Plan (2021-2027)" outlines the European Commission's vision for high-quality, inclusive and accessible digital education in Europe. It is a call to :
  - learn from the COVID-19 crisis, during which technology is being used at an unprecedented scale in education and training
  - make education and training systems fit for the digital age
- The EU's "Coordinated Plan on Artificial Intelligence" encourages the use of AI to solve some of the world's most pressing challenges

Source: https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan_en

3.2. National Responses

National governments are also tackling the impact of digitalisation. In this section we look at a number of responses. Through forecasting and fore-sighting, governments are well aware of the potential labour market impacts

- In this section we look at responses in:
  - England
  - Scotland
  - Germany
  - Italy
  - Romania
  - Spain

3.2. National Responses

- The UK Government's Digital strategy promises a reform of the technical education system including the creation of a specialist digital route, with employers setting standards and specifying the skills individuals will need.
- In Scotland the key policy-driven initiatives and programmes driving digitalisation in HEI are aligned with the vision for Scotland as a productive, innovative and digital nation with an educated and skilled workforce able to successfully engage in the world of work in a globalised modern economy
- In Germany, the Federal Government's Digital Agenda sets out the guidelines for digital policy and bundles measures in central fields of action to help shape digital change
- Italy adopted a National Strategy for Digital Skills in July 2020
- The Romanian Ministry of Education launched a process of public consultation in 2020 to develop a national strategy on the digitalization of education
- The Spanish Inter-Ministry Artificial Intelligence Working Group, coordinated by the Ministry of Science and Innovation, is actively working on the elaboration of the National Artificial Intelligence Strategy

3.3. Potential University responses to these impacts

- Digitalisation offers the potential to change the model of delivery
- COVID has led to adoption of online classes with pre-recorded virtual classes and discussion groups becoming the norm
- Potential to offer smaller modules that can be incorporated in other courses or made available as external provision.
- Relevance of graduates' skillsets is not keeping up with the pace of evolving market requirements.

3.3. Potential University responses to these impacts

Adult learning and External CPD

- Effective adult learning can help prevent skills depreciation and facilitate transitions from declining jobs and sectors to those that are expanding.
- Universities have a role in extending their traditional offer of taught accredited qualifications into CPD modules.
- LMI monitoring will help universities identify existing courses and modules with the potential to be used for external CPD.
- Training needs to be of good quality and aligned to labour market needs
- This may require an internal shift to new processes & systems

3.3. Potential University responses to these impacts

- Extend the University offer outside of the curriculum
  - Universities should extended their offer to:
    - Guaranteed internships and placements;
    - Training in topics outside of their curriculum (digital skills, green skills, etc.);
    - Entrepreneurship training.
  - Students often have skill sets that employers are lacking.
  - Students can also be quickly trained to provide useful internal services as part of a short term internship or placement. E.g. conducting an internal environmental assessment.

- Technology for learning
  - We need to use new technologies for learning & adapting curricula
  - Open education and MOOCs can be leveraged further.
  - Higher-order ICT skills need to be integrated within curricula as a key competence
  - Reinforce the attractiveness of ICT and STEM
  - Exploit new modes of online ICT education delivery and support private industry involvement in e-learning

- Build new relationships
  - Preparing graduates for a digital workplace is essential, yet many feel that their courses do not adequately prepare them for the digital workplace,
  - Universities need to think differently about how to deliver more tailored and nuanced programmes.
  - Universities are collaborating with employers to help shape and deliver curricula to produce work-ready graduates
  - There is a gap in the number of employers who want graduates with work experience, and those willing to offer them.
  - Universities need to reach out to employers and policymakers and fund internships and placement schemes to help retain skilled graduates in their region.
  - Focusing internships on the most disadvantaged groups has the knock-on benefit of tackling social inclusion.

3.3. Potential University responses to these impacts

Build new relationships

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- Focusing internships on the most disadvantaged groups has the knock-on benefit of tackling social inclusion.

3.4. Recommendations for universities and HE policymakers to better utilise LMI and Tools to build on new opportunities

- Skill gaps have improved but graduate skillsets are still not keeping up with the pace of change.
- The widening gap between labour market demand for skills and skills availability is an important challenge for policy makers and firms to address.
- The United States appears to be the only country that has registered significant improvement in closing skills gaps over the last 3 years .

Source: World Economic Forum Executive Opinion Survey, 2018

3.4. Recommendations for universities and HE policymakers

Universities need to:

1. Use existing LMI within their policymaking, curriculum design and extra curriculum planning:
    - Use the Skills Panorama and Skills Ovate to find regional information
    - Use sectoral information to find information on sectors of interest
2. Explore which LMI is most suitable for each type of internal use
3. Provide quality LMI to students to enable them to understand the importance of digital skills to their chosen careers
4. Embed digital skills into the taught curriculum wherever practical
5. Provide additional opportunities for students to obtain digital skills in Summer Schools and extra-curricular courses
6. Support their own staff with digital skills.

Policymakers need to:

1. Link emerging digitization plans to the delivery of conventional HEI programmes.
    - Individuals need to be helped to develop the right skills to thrive in an increasingly digitalised society.
    - Teachers need to be supported to reap the benefits of new teaching and learning possibilities.
2. Recognise the potential role universities can have in tackling digital skills in the labour market:
3. Link digital skills to inclusion
4. Make quality LMI available to workers

Source: [4]

Key takeaways

- The European Union is responding to the potential and threats of digitalisation and AI through a variety of mechanisms designed to ensure it does not fall behind and that all citizens can take advantage of the new opportunities.
- COVID has been a particular driver for certain types of digital working at all levels.
- Nation states are pursuing very similar policies through slightly different routes and at different speeds.
- Universities need to work with policymakers to adapt the way they deliver both their curriculum AND their extra-curricular activities.
- Universities are a tremendous resource in terms of skills and know-how that can be used to help transform the digital approach taken by businesses

Reflection

- Think about the context of your own university.
- Where are the policymakers responsible for University policy and regional economic growth situated? Are they in a position to support Universities to help drive successful and inclusive growth in the region?
- Does your institution have a digital policy? How is it pursuing change in a structured way and is this related at all to the world outside of the University? If not why not?
- What lessons from COVID are there that could assist your University in its embracing of digitalisation?

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