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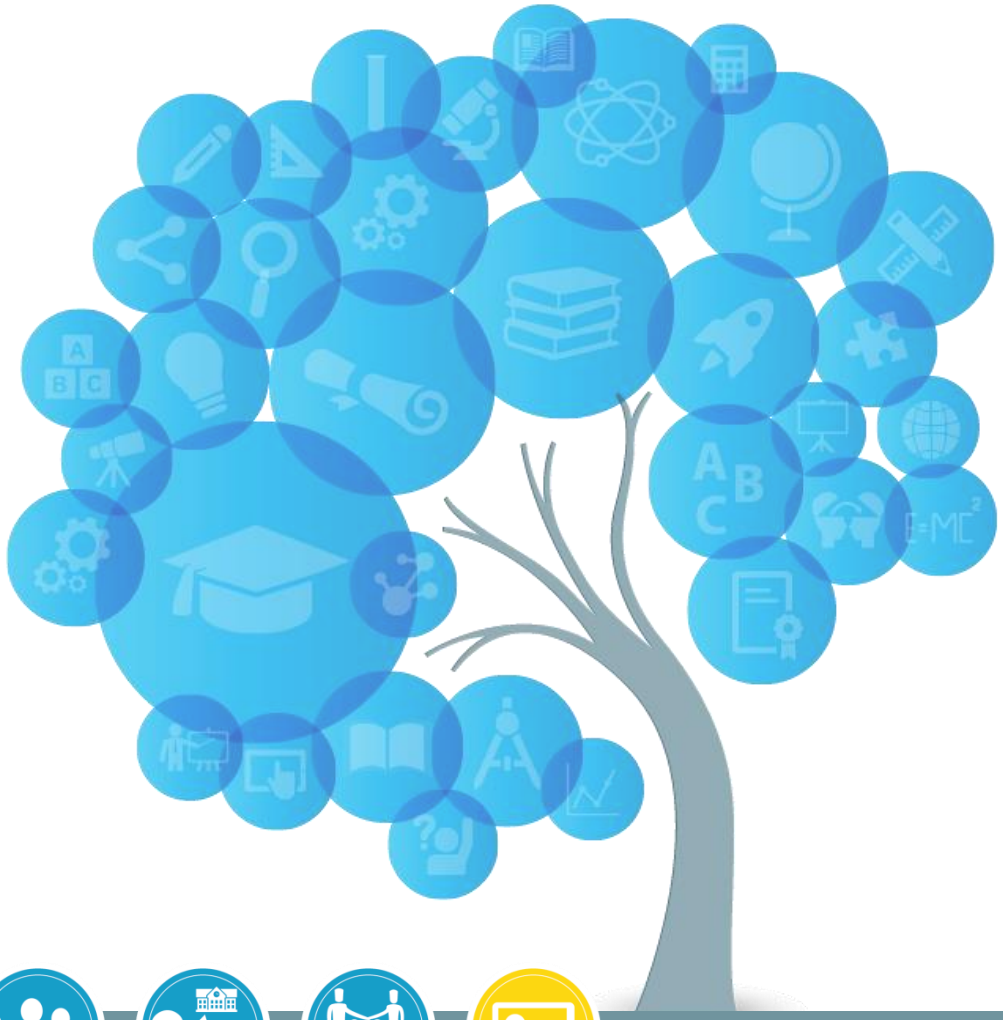

Working in partnership to tackle the digital skills gap

Key messages of PLA#3
Belfast April 2017

Produced by the ET 2020 Working Group on Digital Skills and Competences

Education and Training

Background

The fourth Peer Learning Activity (PLA) of the ET2020 Working Group on Digital Skills and Competences took place on 5-7 April 2017 in Belfast.

The PLA focused on how formal education can successfully work with outside stakeholders to tackle the digital skills gap. The 'digital skills gap' describes the shortage of suitably skilled ICT professionals, job-related digital skills in the workforce as a whole, general digital competences as well as media literacy and critical thinking skills among the wider population.

Many innovative coding and computing clubs and resources are organised by volunteers across Europe. Libraries, and many other public places, are hosting computing classes and makerspaces. Companies are providing digital skills courses, by encouraging their employees to share skills and experience, as part of their 'corporate social responsibility' and/or their business strategies.

How can schools embrace some of these opportunities for the benefits of their students and teaching staff? What are the key ingredients for successful and sustainable cooperation, in particular with local business and industry? And what are the benefits and potentials challenges associated with such partnerships?

These were some of the issues that were explored during the two-and-a-half-days meeting in Belfast, which included a one-day seminar together with local education stakeholders.

Below we have captured some of the key findings and messages of the PLA. These are not meant to represent the views of individual members but to reflect our overall discussions.

Key messages

Skills gap is a major policy concern

- According to the 2017 Digital Economy and Society Index, 44% of people in the EU have very low digital skills and an additional 27% have only basic digital skills. 19% of the people in Europe do not use the Internet.

- Although the number of employed ICT specialist has grown by around 2 million in the EU over last 10 years, there are growing skills mismatches as the demand for ICT professionals far exceeds supply.

- We live with a technology paradox. Young people are quick to consume new technology but in many cases they lack the skills and/or interest to master this technology and use it in more critical and creative ways.

Partnership approach is vital

- Working in partnership to tackle the digital skills gap means creating an ecosystem of many partners, formal and non-formal education, government, industry, civil society and local community groups. Tackling the digital skills gap and boosting digital competences is a shared goal for all of society, therefore a broad partnership of stakeholders is essential. The role of parents is also crucial and is often forgotten in the mix.

- Multi-stakeholder partnerships can be successful as each partner brings its own skills, experience and knowledge to the table. Such collaboration can also help build bridges, for example between formal and non-formal education and work and education.

- Before embarking on a new educational initiative, it is important to see what already exists. Working in partnerships can help prevent a multiplicity of programmes and schemes targeting education.

- The Digital Skills and Jobs Coalition brings together EU Member States, companies, social partners, non-profit organisations and education providers who take action to tackle the lack of digital skills in Europe.

Skills needs in the digital age

- As well as digital skills, problem-solving skills, team work, critical thinking, and the ability to learn will be paramount in the changing labour market. Young people need the right mind set to navigate an increasingly complex jobs market where multiple careers may become the norm.

- Four emerging technologies were discussed at the PLA that will be vital in the future:

    - **Data** - Better use of data for decision making will be a challenge in all sectors of society. Young people will need to be able to create more with digital devices. Data science skills, which rely on good mathematical underpinning and computational thinking skills are required within the curriculum.
    - **Connectivity and the Internet of things** are still embryonic but we will soon be pervasive. We need to prepare our societies and labour market for the changes this will bring.
    - **Artificial intelligence & Machine Learning**. Humans will benefit from decision support from AI/ML but there will be many ethical challenges to be addressed. Young people will need to understand psychology, ethical reasoning and philosophy to compliment software and digital skills.
    - **Virtual Reality and Augmented Reality** are redefining interaction between people and machines. Immersive learning and simulated learning provide opportunities, in the near future, to enhance and change vocational educational and training.

Opportunities and challenges of working with industry

- Industry is engaged with and has a stake in education provision. It provides education input, including materials and content, teacher training and can also 'talent spot' students for future recruitment.

- Cooperation between industry and schools can be a 'win win' situation for both. It is vital to work with regional and local industries as they understand the needs and context of local communities.

- Industry needs can come into conflict with education needs and this should be managed carefully. We should be aware of brand promotion within education. Some schools also suffer from a saturated market with an oversupply of digital tools and educational programmes and initiatives.

- The working group could look further into developing a good practice guide for working with industry.

The need for responsive curricula

- A challenge for our educational systems is to develop and implement curricula and examinations that match the needs of today and tomorrow's labour market. The technology industry, not individual companies, should, depending on the phase of education, be involved or consulted in the process of developing new curricula and examinations.

- The rate of change within the digital industries means that the development of teaching staff is challenging. Industry can have a positive role in providing skills development for teachers when curriculum and examination changes are applied.

Vital to work with non-formal education

- There are many exciting and innovative coding and computing clubs and other resources organised by volunteers across Europe. Some initiatives, such as Coder Dojo, have grown to a global movement represented in 65 countries across the world. The emphasis is on students having fun while learning both hard and soft skills.

- The formal education sector can learn from and should cooperate more with non-formal learning, eg afternoon-clubs and volunteer initiatives. With the digital landscape constantly evolving, partnerships with the non-formal sector are crucial for the development of digital competences.

- Synergy between curricula and the work of non-formal groups would be helpful, to ensure that learning has multiple opportunities to embed.

- Non-formal computing groups appeal to middle and upper social economic groups. The working group might consider how computing/coding, in formal and non-formal setting, can be better accessed by lower socio-economic groups to prevent a 'digital divide'.

Tackling the gender gap is crucial

Despite efforts, female participation in ICT studies in post-primary and vocational education needs to be improved. Challenges are similar for non-formal education. The overall participation rate for girls in Coder Dojo clubs, for example, is at 35%, but this drops considerably from the age of 12 years.

Successful activities within voluntary initiatives include specific coding clubs for girls and female mentors and role models from the ICT industry. More effort should be made to develop targeted educational activities which help foster girls' interest in ICT careers. Industry also needs to communicate clearly that a full range of skills is required for ICT, not only coding and software skills.

More research is required to understand better why females are less likely to pursue careers or curriculum in computing.

Key message for phases of education:

Primary Phase Education (c.5-11 years)

- To have closer connections between school and the world of work it is important to involve the whole community, including teachers, parents, students themselves and industry.
- Industry can play a key role in teacher training as seen in BT's Barefoot Academy programme as well as in non-formal learning, as seen in the school visit where industry runs after-school coding clubs.
- It is important to have a curriculum which systematically includes not only science, technology, engineering, arts and mathematics (STEAM) but also problem-solving skills and computational thinking. The emphasis should be on the formative assessment of core skills.
- Teachers' communities of practice can play a crucial role, eg through online collaboration and peer-to-peer support.
- Learning, at this phase of education, should be student-centred, not industry-centred. More emphasis should be given to student-centred learning, including project based learning, flipped classrooms with greater emphasis on creativity and creating.

Secondary Phase Education (c.11-19 years)

- The secondary phase of education is the key stage for combating gender imbalance, since participation rate of girls in STEM can drop after the age of 12.
- It is vital to develop structured collaboration with industry, to have role models – particular for girls, and entrepreneurship schemes. Mentorships and work placement programmes could also play a critical role.
- Collaboration with Higher Education Institutions, including universities, is also important during this phase. The e-twinning platform could possibly be used as a platform for exchange.
- Curricula developed jointly with industry could be strengthened but teaching needs to be firmly centred on the needs of students rather than industry.
- It is vital to encourage personalised and project-based learning as well as real-life problem solving with industry.
- The role of parents is essential and is often overlooked. Parents can be key influencers for subjects and career choices.

Vocational Phase Education and adult learning (c.16+ years)

- It is important that the economic environment is well understood and curricula are designed in collaboration with industry. A demand-driven approach during this phase of education is important.
- Structured cooperation and exchange between students and workplace at this stage is crucial.
- The Assured Skills Academy seen at the Belfast Metropolitan College was an interesting example which could be replicated in other countries. Under the scheme, graduates who are either unemployed or underemployed are trained for ICT professions. In the last two years Belfast Met has delivered 26 Assured Skills Academies, working with 468 graduates from across different academic disciplines with 93% employment rate of graduates.