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*Unit GROW-F3 KETs,
Digital Manufacturing
and Interoperability*

Tackling KETs skills challenges together: the way forward

Vision and Sectoral Pilot on Skills for Key Enabling Technologies

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Technologies and Digital Economy**

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Tackling KETs skills challenges together

Key challenges related to KETs skills in Europe



Action streams:



Tackling KETs skills challenges together

Key highlights of Vision Paper

Vision Paper objectives

- The Vision Paper ***sketches the overall vision on skills for KETs in Europe and offers specific measures.***
- It specifically highlights the ***key directions for action*** regarding both qualitative and quantitative KETs skills-related challenges.

Tackling KETs skills challenges together

Key highlights of Vision Paper

Overall vision on skills for KETs in Europe:

- For Europe to be able to fully realise KETs growth potential in the future, there is **a need to align the supply and demand of KETs skills from both qualitative and quantitative perspectives.**
- From a *qualitative* perspective, Europe needs to ensure **a good alignment of the type and mastery levels of skills possessed by the current and future employees, with industry requirements.**
- From a *quantitative* perspective, Europe needs to ensure the presence of **a sufficient number of people who are qualified, available and willing to work in KETs.**

Tackling KETs skills challenges together

Key highlights of Vision Paper

- The development and maintenance of KETs skills in Europe is a ***complex multi-faceted challenge that requires a complex solution.***
- This complex solution consists of various clusters of measures each targeted at specific aspects of the overall challenge.
- ***Action is required at all levels.***
- There is a clear need to join forces and apply a comprehensive approach, thereby enabling Europe to fully benefit from the opportunities offered by KETs for decades to come.
- For some actions, European-level intervention is needed -> ***key focus of this Vision Paper***

Tackling KETs skills challenges together

Key highlights of Vision Paper

- We focus on ***measures that have a multi-KETs orientation***, i.e. measures that are common to multiple or all KETs.
- The objective is to outline an overarching set of measures that would allow ***tackling KETs-skills related issues in Europe from a ‘common core’ perspective***.
- The individual peculiarities of specific KETs (let alone specific job profiles) are not addressed in detail in this paper.
- Nevertheless, when applying the proposed measures at the level of an individual KET, we highly recommend taking into account the specificities of that particular KET including its level of development, existing measures, additional specific skills that need to be trained etc.

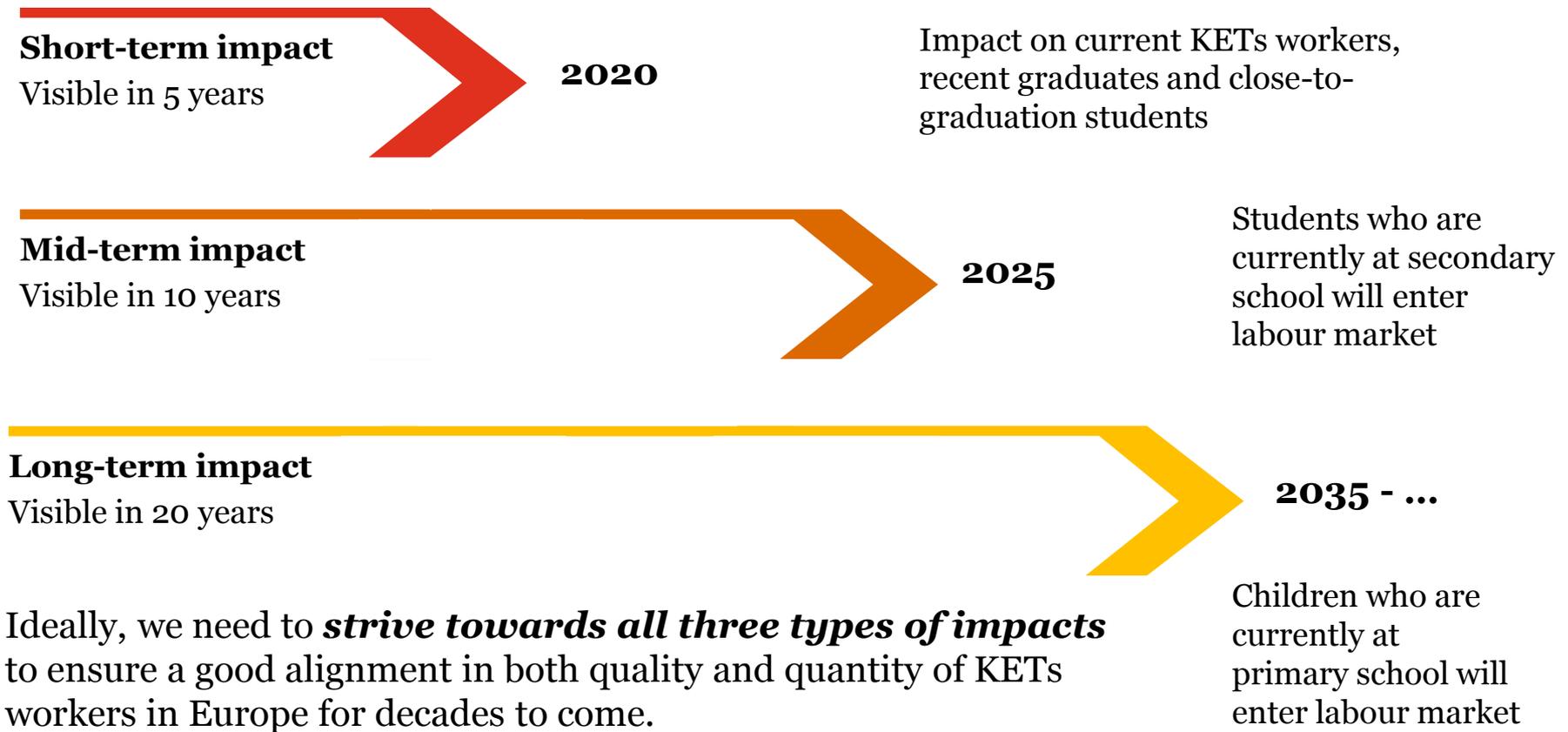
Tackling KETs skills challenges together

Key highlights of Vision Paper

- A wide range of measures aiming to enhance KETs skills are already applied by various stakeholder groups at the EU, MS, regional and organisational levels.
- The measures proposed in this paper aim at ***creating synergy and ensuring good complementarity with the activities already taking place*** in the area of STEM skills in general and KETs in particular.
- ***Not all MS are at the same level of development*** when it comes to tackling KETs skills issues.
- Leading MS should keep up doing the good work and inspire others.
- Other MS should consider including KETs skills in their priorities and learn from good practices.

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Different levels of impact of proposed measures



Ensuring a good alignment of educational programmes with industry needs (Stream A)

Key issue	Measures	Target groups	Impact
Lack of mind-set allowing to thrive in a highly dynamic and uncertain technological and business environment	A1 Putting the development of learning-to-learn skills central in the curriculum	Primary school students, secondary school students	Long-term 
	A2 Training entrepreneurial alertness	Secondary school students, Bachelor and Master students	Mid-term 
	A3 Training continuous experimentation and the ability to thrive on failures	Secondary school students, Bachelor and Master students	Mid-term 
	A4 Training integration skills and collective problem solving	Secondary school students, Bachelor and Master students	Mid-term 
	A5 Training entrepreneurial adaptability	Secondary school students, Bachelor and Master students	Mid-term 

Ensuring a good alignment of educational programmes with industry needs (Stream A)

Key issues	Measures	Target groups	Impact
Need for people who can work 'on the crossroads' of different disciplines	A6 Embedding technical multidisciplinary in the curriculum	Vocational education students, short-cycle tertiary education students, Bachelor students, Master students, PhD students	Mid-term Short-term
Need for people who possess both technical and non-technical skills	A7 Embedding non-technical courses in technical curricula	Vocational education students, short-cycle tertiary education students, Bachelor students, Master students, PhD students	Mid-term Short-term
Need for people with a problem-solving mind-set	A8 Offering problem-based learning	Vocational education students, short-cycle tertiary education students, Bachelor students, Master students	Mid-term Short-term

Ensuring a good alignment of educational programmes with industry needs (Stream A)

Key issues	Measures	Target groups	Impact
Need for educational personnel to be well aware of the latest industry developments	A9 Updating the skills of teachers/ professors	Educational personnel from secondary schools to Master programmes	Mid-term 
Need for educational system to be able to adjust to changing industry needs	A10 Promoting innovation in teaching	Educational personnel from primary schools to Master programmes	Mid-term  Long-term 
Need for common definitions and skills framework	A11 Developing a multi-competence framework	Educators, industry, policy makers, broader community	Short-term 
Need for a monitoring platform to trace changes in supply and demand of KETs skills	A12 Developing “KETs Skills Observatory”	Educators, industry, policy makers, broader community	Short-term 

Facilitating regular (re-)training of current employees (Stream B)

Key issues	Measures	Target groups	Impact
Some of skills need to be trained by companies themselves	B1 Offering on-the-job training	Current KETs workers	Short-term 
High costs and organisational capacity issues related to training activities	B2 Collectively organising training programs and apprenticeships	Current KETs workers	Short-term 
Need for advanced management skills for the drivers of complex commercialisation trajectories	B3 Offering technical MBA programmes for business leaders	Master students, current KETs workers	Short-term 
Need to take into account ageing of KETs workers	B4 Analysing the abilities and limitations of elderly workers	Current KETs workers	Short-term 
Many companies hesitate to invest in the training of personnel	B5 Convincing companies about benefits of training and skills development	Industry	Short-term 

Raising awareness about KETs in the society (Stream C)

Key issues	Measures	Target groups	Impact
Lack of awareness among students and parents of what it is to work in KETs	C1 Organising open days for future employees	Students at all levels	Mid-term 
Lack of awareness among students and parents of opportunities offered by KETs	C2 Organising open days for future students	Secondary school students	Mid-term 
Lack of awareness among students and teachers of opportunities offered by KETs	C3 Supporting the development of educational kits	Primary school students, secondary school students	Mid-term  Long-term 
Lack of awareness among students of opportunities offered by KETs	C4 Supporting the development of KETs-related MOOCs	Secondary school students, Bachelor students, broader publics	Mid-term  Short-term 

Raising awareness about KETs in the society (Stream C)

Key issues	Measures	Target groups	Impact
Lack of awareness among students of opportunities offered by KETs	C5 Developing a targeted communication strategy to increase awareness on KETs	Primary school students, secondary school students	Mid-term  Long-term 
Lack of awareness among general public of opportunities offered by KETs	C6 Launching awareness-raising activities about KETs aimed at the general public	General public	Mid-term 

Improving the image of KETs as a field to work in (Stream D)

Key issues	Measures	Target groups	Impact
Need to understand what drives (or diminishes) public's interest in KETs	D1 Analysing the motivation of young people to enter (or not to enter) KETs domain	Secondary school students, parents, teachers, society in general	Mid-term 
Need to actively promote an attractive image of KETs	D2 Developing a targeted communication strategy to improve the image of KETs	Secondary school students, broader community	Mid-term 
Poor working conditions and relatively unattractive career opportunities in KETs	D3 Improving working conditions	Vocational education students, short-cycle tertiary education students, Bachelor students, Master students, PhD students, current KETs workers	Mid-term  Short-term 

Overview of timelines

ID	Task Name	2015		2016		2017		2018		2019		2020		2021		2022		2023		2024		2025		2026		2027	
		H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	
1	(Stream A) Ensuring a good alignment of educational programmes with industry needs	[Timeline bar from 2015 H2 to 2025 H2]																									
2	A1 Putting the development of learning-to-learn skills central in the curriculum	[Timeline bar from 2015 H2 to 2020 H2] Educators																									
3	A2 Training alertness	[Timeline bar from 2015 H2 to 2020 H2] Educators																									
4	A3 Training continuous experimentation and the ability to thrive on failures	[Timeline bar from 2015 H2 to 2020 H2] Educators																									
5	A4 Training integration skills and collective problem solving	[Timeline bar from 2015 H2 to 2020 H2] Educators																									
6	A5 Training entrepreneurial adaptability	[Timeline bar from 2015 H2 to 2020 H2] Educators																									
7	A6 Embedding technical multidisciplinary in the curriculum	[Timeline bar from 2015 H2 to 2020 H2] Educators																									
8	A7 Embedding non-technical courses in technical curricula	[Timeline bar from 2021 H1 to 2021 H2] Educators																									
9	A8 Offering problem-based learning	[Timeline bar from 2015 H2 to 2025 H2] Educators																									
10	A9 Updating the skills of teachers	[Timeline bar from 2015 H2 to 2021 H2] Educators, industry																									
11	A10 Promoting innovation in teaching	[Timeline bar from 2015 H2 to 2021 H2] Policy makers																									
12	A11 Developing a multi-competence framework	[Timeline bar from 2016 H1 to 2017 H1] Policy makers																									
13	A12 Developing "KETs Skills Observatory"	[Timeline bar from 2016 H1 to 2017 H1] Policy makers																									
14	(Stream B) Facilitating regular (re-)training of current employees	[Timeline bar from 2015 H2 to 2021 H2]																									
15	B1 Offering on-the-job training	[Timeline bar from 2015 H2 to 2021 H2] Industry																									
16	B2 Collectively organising training programs and apprenticeships	[Timeline bar from 2015 H2 to 2021 H2] Industry																									
17	B3 Offering technical MBA programmes for business leaders	[Timeline bar from 2015 H2 to 2021 H2] Educators																									
18	B4 Analysing the abilities and limitations of elderly workers	[Timeline bar from 2015 H2 to 2021 H2] Industry, policy makers																									
19	B5 Convincing companies that the return on training and skills development investment is sufficient to offset the costs	[Timeline bar from 2015 H2 to 2021 H2] Policy makers																									
20	(Stream C) Raising awareness about KETs in the society	[Timeline bar from 2015 H2 to 2021 H2]																									
21	C1 Organising open days for future employees	[Timeline bar from 2015 H2 to 2021 H2] Industry																									
22	C2 Organising open days for future students	[Timeline bar from 2015 H2 to 2021 H2] Educators																									
23	C3 Supporting the development of educational kits	[Timeline bar from 2015 H2 to 2021 H2] Industry, educators, policy makers																									
24	C4 Supporting the development of KETs-related MOOCs	[Timeline bar from 2015 H2 to 2021 H2] Educators, industry, policy makers																									
25	C5 Developing a targeted communication strategy to increase awareness on KETs	[Timeline bar from 2015 H2 to 2021 H2] Policy makers																									
26	C6 Launching awareness-raising activities about KETs aimed at the general public	[Timeline bar from 2015 H2 to 2021 H2] Policy makers																									
27	(Stream D) Improving the image of KETs as a field to work in	[Timeline bar from 2015 H2 to 2021 H2]																									
28	D1 Analysing the motivation of young people to enter (or not to enter) KETs domain	[Timeline bar from 2015 H2 to 2021 H2] Policy makers																									
29	D2 Developing a targeted communication strategy to improve the image of KETs	[Timeline bar from 2015 H2 to 2021 H2] Policy makers																									
30	D3 Raising the quality of infrastructure and improving working conditions	[Timeline bar from 2015 H2 to 2021 H2] Industry																									

Thanks a lot for your attention!

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