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European Expert Network on Economics of Education

The latest research trends in the field of economics of education: January-June 2021

EENEE Coordination team

Education and Training

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ABOUT EENEE

EENEE is an advisory network of experts working on economics of education and training. The establishment of the network was initiated by the European Commission's Directorate-General for Education and Culture and is funded by the Erasmus+ Programme. PPMI is responsible for the coordination of the EENEE network. More information on EENEE and its deliverables can be found on the network's website www.eenee.eu. For any inquiries, please contact us at: eenee@ppmi.lt.

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As part of the EENEE's advisory function, the Coordination team tracks the latest research trends from the most prominent academic journals in the field of economics and education (see Table 1). These journals are checked monthly (the first week of every month). In addition to the academic journals, we consider the most recent publications from the major international organisations such as OECD, UNICEF, and UNESCO.

TABLE 1. LIST OF ACADEMIC JOURNALS

NO.	JOURNAL	RATING
1.	**Quarterly Journal of Economics**	36.220
2.	**Journal of Political Economy**	21.239
3.	**Journal of Finance**	17.134
4.	**Econometrica**	14.563
5.	**Review of Economic Studies**	14.235
6.	**Journal of Labor Economics**	11.572
7.	**Journal of the European Economic Association**	7.832
8.	**Review of Educational Research**	7.474
9.	**Journal of Economic Growth**	6.666
10	**Journal of Human Resources**	4.777
11	**Internet and Higher Education**	4.247
12	**Journal of Development Economics**	3.585
13	**Education Finance and Policy**	3.214
14	**Sustainability**	2.576
15	**Economics of Education Review**	1.819
16	**Journal of Human Capital**	1.392
17	**Education Next**	0.847
18	**International Journal of Educational Research**	0.737
19	**Education Economics**	0.539
20	**Citizenship, Social and Economics Education**	0.333
21	**Economies**	0.324
22	**International Journal of Education Economics and Development**	0.222

Source: prepared by the Coordination team

To ensure that we use a systematic approach, we developed a list of keywords (see Table 2) that we follow for guidance, and we keep a record of *all* relevant articles. For the review of the latest research trends, we match the most common/popular topics to the European Commission's (EC) current priorities[1].

TABLE 2. LIST OF KEYWORDS

KEYWORDS:	
Economics of education	Digitalisation
Labour market	Education and poverty
Early childhood education	Education and economic crises
Inclusivity	Education and innovation
Teacher training	GDP growth
Human capital	Global education
Long-term loss	Education abroad

Source: prepared by the Coordination team

1 https://ec.europa.eu/info/strategy/priorities-2019-2024_en

The selection of articles is based on their a) relevance (European studies, topical issues such as COVID-19), and b) topics reflecting the EC's priorities the best. For the review of the latest research trends, we looked at the following topics:

- COVID-19: Immediate and long-term response
- Digital skills
- Education for all (linked to the European Education Area focus)
- Skills for sustainable competitiveness.

This summary of the most relevant articles from top-ranked journals includes the following major topics:

- COVID-19: Immediate and long-term response
- Digital skills
- Education for all (includes training, education and immigration, education efficiency, teacher training)
- Skills for sustainable competitiveness.

The research on the economics of education from the COVID-19 perspective

At the beginning of the contract, the Coordination team reviewed the publications from 2020 to gain a better understanding of how the research trends are changing in 2021. Not surprisingly, 2021 research is far more focused on the COVID-19 pandemic, its impact on education, and economic losses. Looking at the broader picture, the issues covered in 2021 include **digital competencies**, **inequalities**, **teacher training/upskilling, learning losses,** and **remote learning.** The most recent articles seem to be less focused on the potential losses and, instead, evaluate different policy responses[2] and solutions to the problems. Also, some articles recognise that the education system may have a significant impact on the future economy and labour market (e.g., education directly impacts the recovery from the economic crisis)[3]. For instance, there appears to be a real need, in all levels of education, to improve, or perhaps even reform, the academic content[4] to promote critical thinking[5] and problem-solving life skills.[6]

A topical issue appears to be learning losses due to the COVID-19 pandemic, particularly in the context of 'lost hours' of learning. Some authors[7] argue that, while there is evidence that lost learning hours/days have a significant impact, additional learning hours may not be as effective as initially imagined. Moreover, it was noticed that not only the 'lost hours' was the problem in the context of education and COVID-19, but also the lack of practical skills, which are crucial to VET learning.[8] Furthermore, a clear message from the academics is that teacher competence[9];[10] (mainly digital skills) requires urgent attention; otherwise, the education systems will remain at a standstill.

2 OECD (2021), The State of School Education: One Year into the COVID Pandemic, OECD Publishing, Paris. Available at https://doi.org/10.1787/201dde84-en

3 OECD (2021), Teaching and learning in VET: Providing effective practical training in school-based settings, OECD Publishing, Paris. Available at https://doi.org/10.1787/64f5f843-en

4 Sánchez Ruiz, L. M., et al. (2021), B-learning and technology: Enablers for university education resilience, an experience case under COVID-19 in Spain', Sustainability, 13(6), 3532.

5 UNESCO (2021), Learn for our planet. a global review of how environmental issues are integrated in education. Available at https://unesdoc.unesco.org/ark:/48223/pf0000377362.locale=en

6 Roczen, N., et al. (2021), Measuring System Competence in Education for Sustainable Development, Sustainability, 13(9), 4932. Available at https://www.mdpi.com/2071-1050/13/9/4932

7 Schleicher, A. (2021), Repeating the school year not the answer to COVID learning losses, OECD Publishing. Available at https://oecdedutoday.com/repeating-school-year-not-the-answer-to-covid-learning-losses/

8 OECD (2021), Teaching and learning in VET: Providing effective practical training in school-based settings, OECD Publishing, Paris. Available at https://doi.org/10.1787/64f5f843-en

9 Sánchez-Cruzado, C., Santiago Campión, R., Sánchez-Compaña, M. (2021), Teacher Digital Literacy: The Indisputable Challenge after COVID-19, Sustainability, 13(4), 1858. Available at https://doi.org/10.3390/su13041858

10 OECD (2021), Teaching and learning in VET: Providing effective practical training in school-based settings, OECD Publishing, Paris. Available at https://doi.org/10.1787/64f5f843-en

This issue, which is repeated in several articles[11], seems to be very much in line with the European Commission's priorities as the Commission addresses it with various initiatives such as the Digital Competence Framework for Educators (DigCompEdu)[12].

Education and digital skills

The research relating to digital competence and digital skills is not always linked to the COVID-19 pandemic. In fact, as a priority and an interest, it became apparent prior to the pandemic putting to the spotlight crucial gaps. In this first half of the year, several papers discuss the importance of promoting digital competencies. For instance, a paper by Yang et al. (2021) develops a framework of digital learning competence with six dimensions, namely **technology use, cognitive processing, reading skills, peer management, time management,** and **will management.** To ensure that students are competent for the future labour market, it is indeed vital to guarantee that they have 21st Century skills. However, this cannot be done without competent (tech-savvy) educators that match such descriptions. Therefore, yet again, teacher training[13] comes to daylight as a matter of attention.

Education for the future

Several studies emerged measuring sustainable innovation[14] and competence in ESD.[15] For example, a study by Ferreras-Garcia et al. (2021) measuring the impact of gender on innovation competencies is the first of this kind. UNESCO[16] has also published a global review of how environmental issues are integrated into education, which highlights that in order to create a long-lasting change towards sustainability, education is crucial. However, this review revealed several gaps in the education approach and content that could benefit from reconsideration.

A very topical issue in several research papers appears to be **gender gaps**, both in the context of COVID-19 and as an ongoing, still fully unaddressed issue. The topic varies in content, but some of the most common aspects analysed are such as:

- Gender gaps in numeracy and literacy and its implementation on wage[17]
- The impact of gender on innovation competences[18]
- College gender gap.[19]

Below, we list the most important articles on topics that reappear through our regular tracking of research trends. Each article contains a key message (for clarity, sometimes in the form of a citation) and a short description of the main findings.

11 OECD (2021), Delivering Quality Education and Health Care to All: Preparing Regions for Demographic Change, OECD Rural Studies, OECD Publishing, Paris. Available at https://doi.org/10.1787/83025c02-en.

OECD (2021), Teachers and Leaders in Vocational Education and Training, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris. Available at: https://doi.org/10.1787/59d4fbb1-en.

12 DigCompEdu - https://ec.europa.eu/jrc/en/digcompedu

13 Beaton, M. C., et al. (2021), Conceptualising teacher education for inclusion: lessons for the professional learning of educators from transnational and cross-sector perspectives, Sustainability, 13(4), 2167. Available at https://doi.org/10.3390/su13042167

14 Ferreras-Garcia, R., Sales-Zaguirre, J., Serradell-López, E. (2021), Sustainable Innovation in Higher Education: The Impact of Gender on Innovation Competences, Sustainability, 13(9), 5004. Available at https://www.mdpi.com/2071-1050/13/9/5004

15 Roczen, N., et al. (2021), Measuring System Competence in Education for Sustainable Development, Sustainability, 13(9), 4932. Available at https://www.mdpi.com/2071-1050/13/9/4932

16 UNESCO (2021), Learn for our planet. a global review of how environmental issues are integrated in education. Available at https://unesdoc.unesco.org/ark:/48223/pf0000377362.locale=en

17 Borgonovi, F., Choi, A., Paccagnella, M. (2021), The evolution of gender gaps in numeracy and literacy between childhood and young adulthood. Economics of Education Review, 82, 102119. https://www.sciencedirect.com/science/article/abs/pii/S0272775721000388

18 Ferreras-Garcia, R., Sales-Zaguirre, J., Serradell-López, E. (2021), Sustainable Innovation in Higher Education: The Impact of Gender on Innovation Competences, Sustainability 13, no. 9: 5004. https://doi.org/10.3390/su13095004

19 Zhang, H. (2021), An Investment-and-Marriage Model with Differential Fecundity: On the College Gender Gap, Journal of Political Economy, 129(5), 1464-1486. https://www.journals.uchicago.edu/doi/10.1086/713097

1.1. COVID-19: Immediate and long-term response

1.1.1. Schools

UNICEF (2021), *Practical guide to blended/remote learning and children with disabilities*. Available at https://www.unicef.org/reports/practical-guide

Key message: *Preparation prior to implementing blended/remote learning is necessary.*

The COVID-19 pandemic shook the education system to such an extent that the majority of schools globally had to shut and, in many cases, transfer their lessons to online platforms. The *Practical Guide* was created[20] in response to the COVID-19 pandemic, it can be used in various circumstances when blended/remote learning is applied. In particular, this guide is relevant to children with disabilities. This publication provides a guide to blended/remote learning. Specifically, it highlights what should happen *before* blended/remote learning is implemented. In broader terms, these steps include:

- Developing an inclusive education (or service) community.
- Education Monitoring Information System (EMIS).
- Individualised Education Plans (IEPs).
- Training.

OECD (2021), *The State of School Education: One Year into the COVID Pandemic*, OECD Publishing, Paris. Available at https://doi.org/10.1787/201dde84-en

Key message: *'Last year, 1.5 billion students in 188 countries were locked out of their schools. Some of them were able to find their way around closed school doors through alternative learning opportunities, well supported by their parents and teachers. However, many remained shut out when their school shut down, particularly those from the most marginalised groups, who did not have access to digital learning resources or lacked the support or motivation to learn on their own. The learning losses that follow from school closures could throw long shadows over the economic well-being of individuals and nations.*' (OECD, 2021, p. 3).

This report provides an initial insight into the COVID-19 situation in 2020 following the school closures across the globe. More specifically, the report presents findings on how different systems responded to the crisis. This includes school closures and remote learning, teacher vaccination and gradual returns to in-class instruction.

Schleicher, A. (2021), *Repeating the school year not the answer to COVID learning losses*, OECD Publishing. Available at https://oecdedutoday.com/repeating-school-year-not-the-answer-to-covid-learning-losses/

Key messages:

- *'Repeating school could amplify existing social disparities without making up for learning losses.'*
- *'Resources should be invested in targeted measures to help struggling students.'*
- *'Countries need to learn the lessons of the pandemic to make education systems more resilient.'* (*Schleicher, 2021).*

OECD Director (Directorate for Education and Skills) Andreas Schleicher argues that repeating a school year as an option to 'regain' the learning losses caused by the mass school closures during the COVID-19 pandemic may not be the obvious solution to the problem. In fact, Schleicher writes that '*OECD analyses of grade repetition suggest that it is far from certain that just repeating the school year will make up for the learning losses*' (2021). An important insight from Schleicher is that it may be far more beneficial to prioritise the content of the curriculum (i.e., introduce new content) instead of repeating the same old material.

20 The drafting of the guide was led by DED - Disability, Education and Development - Lda.

OECD (2021), *What can schools and teachers do to boost students academically?*, Teaching in Focus, OECD Publishing, Paris, No. 38. Available at https://doi.org/10.1787/6a8a364d-en

Key messages: *Mixing students from different socio-economic backgrounds and innate abilities in classrooms, making sure that teachers are happy, and allowing them to spend most of their classroom time teaching are all factors that help students perform better academically. (OECD, 2021, p. 5).*

Similarly to the aforementioned article by Schleicher, this OECD publication highlights the importance of teaching quality. While the engagement and teacher-pupil time is of vast importance to academic achievements, extra curriculum activities involving teachers can add value to boosting students academically. However, to ensure the much-needed engagement between teachers and students, it is equally as important to pay attention to the teacher's job satisfaction levels. Furthermore, optimising classrooms can be beneficial, particularly for those pupils from more disadvantaged backgrounds.

1.1.2. VET

OECD (2021), *Teaching and learning in VET: Providing effective practical training in school-based settings*, OECD Publishing, Paris. Available at https://doi.org/10.1787/64f5f843-en

Key message: *Bringing a practical component of VET into the VET classroom is crucial to ensure effective school-based practical learning.*

Due to the COVID-19, there was a reduction in work-based learning for VET. Shortages of practical learning components can have a detrimental effect on recovery from the crisis (lack of skills, lower rates of prospective students in VET). To avoid such problems, countries need to support the VET by bringing a practical component of VET into the VET classroom. This publication provides recommendations on how countries can implement changes and give the needed practical learning for students by providing (OECD, 2021):

- A guidance and teaching resources to VET schools.
- Better collaboration of social partners and industry experts.
- Training to VET teachers and/or hiring new VET teachers.
- The use of simulators (VR, AR) in VET.
- Incentives to software developers.
- Necessary digital skills to VET teachers.

1.1.3. Universities

Sánchez Ruiz, l. M., Moll-López, S., Moraño-Fernández, J. A., Llobregat-Gómez, N. (2021), *B-learning and technology: enablers for university education resilience, an experience case under covid-19 in Spain',* Sustainability, 13(6), 3532.

Key message: *'Results obtained indicated that the use of digital resources and educational platforms caused a noticeable change in the students' way of learning, improving habits and digital skills.'* (Sánchez et al., 2021)

The article discusses the role that blended learning (b-learning) played at Technological University in Spain at the beginning of the COVID-19 pandemic. The key findings include:

- **B-learning methodologies enhanced subject adaptation to online teaching.** Such a methodological approach proved to be effective, especially in terms of allowing students to study self-paced and provided more freedom.
- **Digital technologies facilitated university adaptation.** The use of a variety of digital technology tools alleviated the lack of face-to-face sessions and changed students perception of learning.

- **Initial digital skills influenced the perception of the adaptation.** The existing digital skills facilitated a smooth transition to online learning and caused little disruption to students' learning.
- **The adaptation process has caused a change in the students' way of learning.** The majority of students surveyed for this study state that some of the newly introduced digital resources during the COVID-19 pandemic have been effective and that it would be beneficial to continue their facilitation after the pandemic ends. These include recorded classes, video notes, online tutorials, and the ability to receive classes at home.

Drašler, V., Bertoncelj, J., Korošec, M., Pajk Žontar, T., Poklar Ulrih, N., Cigić, B. (2021), *Difference in the attitude of students and employees of the university of Ljubljana towards work from home and online education: Lessons from COVID-19 pandemic*, Sustainability, 13(9), 5118. Available at: https://www.mdpi.com/2071-1050/13/9/5118

Key message: *'Overall, the majority of the respondents from all groups wish for the pre-COVID-19 study/work mode to be established as soon as possible. This implies that the perceived drawbacks of online education outweigh its advantages.' (Drašler et al., 2021)*

This study of Slovenian university students and educators (surveyed in November 2020) reveals that among the most significant drawbacks of home-learning during the pandemic were a **less suitable working environment**, **lower efficiency**, and **higher stress levels**. At the same time, the benefits of working/studying from home include **reduced commuting**, **improved eating habits**, and **more time spent with family**.

1.2. Digital skills

Sánchez-Cruzado, C., Santiago Campión, R., Sánchez-Compaña, M. (2021), *Teacher Digital Literacy: The Indisputable Challenge after COVID-19*, Sustainability, 13(4), 1858. Available at https://doi.org/10.3390/su13041858

Key message: *'The study reveals that digital literacy is not a reality that has favored the teaching–learning process and that a training program is urgently required for teachers to reach optimal levels of digital skills, so as to undergo a true paradigm shift, ultimately combining methodology and educational strategies.' (Sánchez-Cruzado, et al., 2021)*

The COVID-19 pandemic highlighted crucial gaps that exist in the education systems globally. While access to learning devices has been an indisputable challenge, another issue that many countries have faced is the lack of digital literacy among teachers. This study in Spanish teachers shows a low intermediate total (B1) competency level [digital literacy] of the teachers participating in this study. Notably, 'only 1.7% of those surveyed reach a really high level, C2, and 7.5% reach a level C1.' (Sánchez-Cruzado, et al., 2021). The study highlights the urgency of the training programmes needed to tackle this issue that is important to address not just during but also beyond the ongoing pandemic.

Yang, J., Tlili, A., Huang, R., Zhuang, R., Bhagat, K. K. (2021), *Development and Validation of a Digital Learning Competence Scale: A Comprehensive Review*, Sustainability, 13(10), 5593. Available at https://doi.org/10.3390/su13105593

Key message: *'Understanding the structure of digital learning competence could contribute to the cultivation of student learning ability in a digital world. The six identified competencies, namely technology use, cognitive processing, digital reading, peer management, time management and will management should be taken into consideration to promote students' 21st century skills.' (Yang et al., 2021).*

Based on the existing international research (including European research), this study created a framework of digital learning competence with six dimensions, namely **technology use, cognitive processing, reading skills, peer management, time management and will management.** The authors developed and validated a scale that could be used to assess these competencies. This framework will be vital for measuring and promoting the 21st Century skills.

OECD (2021), *Teachers and leaders in vocational education and training, OECD reviews of vocational education and training*, OECD Publishing, Paris. Available At: https://doi.org/10.1787/59d4fbb1-en.

Key message: *The shortages of VET teachers and leaders and lack of training directly affect the quality of VET.*

Due to the changing labour market needs, including the demand for new digital and soft skills and new pedagogical approaches and technologies, there is a need for well-trained VET teachers and leaders. However, not only there are shortages of VET teachers/leaders, the training for them is also hardly accessible because of various reasons, including lack of support or incentives and conflicts with their work schedule. This paper suggests several recommendations (OECD, 2021):

- Adequate supply of VET teachers (increase the attractiveness of VET teaching by providing financial incentives, professional development, targeted support).
- Preparation and development of VET teachers (developing pedagogical, basic, digital, vocational, and soft skills).
- Innovative pedagogical approaches (including the use of online learning, AI, robotics, simulators).
- Strengthened VET leadership (clarifying their roles and tasks, providing the access to trainings, and developing professional skills).

OECD (2021), *OECD Skills outlook 2021: learning for life*, OECD publishing, Paris. Available at https://doi.org/10.1787/0ae365b4-en.

Key message: *Effective and inclusive lifelong learning helps to quickly adapt and succeed in labour markets, and it must be an essential part of everyone's life.*

When navigating in nowadays life, people should consider lifelong learning as an inevitable part of their life, including formal, informal, and non-formal learning. Lifelong learning facilitates to better adapt to the labour market and have strong foundational skills. Sudden shocks as the COVID-19 pandemic once again highlighted the problem that countries are not promoting and ensuring lifelong learning to everyone (e.g., not all children have the same access to remote learning). This outlook recommends place learners at the centre of learning, provide skills for a lifetime, and ensure strong coordination among the learning systems.

UNESCO (2021), *AI and education: guidance for policymakers*. Available at https://unesdoc.unesco.org/ark:/48223/pf0000376709

Key message: *Nowadays, AI and education cannot be separated. However, it depends on the national and socio-economic circumstances.*

Artificial intelligence (AI) supports SDG 4: *Ensure inclusive and equitable quality education, promote lifelong learning opportunities for all, and become* a part of education. It helps to create 'Intelligent', 'adaptive' and 'personalised' learning systems. AI enhances the inclusion, quality of learning, education management and provides opportunities for lifelong learning. However, AI also leads to challenges and risks, as well as raises social and ethical implications (e.g., ensure access for all countries). This paper provides recommendations for AI-and-education policies:

- Creating a system-wide vision of AI and education policies.
- Adopting a humanistic approach as an overarching principle for AI and education policies.
- Ensuring interdisciplinary planning and inter-sectional governance.
- Adapting policies and regulations for equitable, inclusive, and ethical use of AI.
- Adopting master plans for using AI in education management, teaching, learning, and assessment.
- Performing the pilot testing, monitoring and evaluation, and build an evidence base.
- Fostering local AI innovations for education.

1.3. Education for all

1.3.1. Training

Blundell, R., Costa-Dias, M., Goll, D., Meghir, C. (2021), *Wages, experience, and training of women over the life cycle*, Journal of Labour Economics, Vol. 39, S1. Available at https://doi.org/10.1086/711400

Key message: *'Training is potentially important in compensating for the effects of children, especially for women who left education after completing high school, but does not fundamentally change the wage gap resulting from labor market interruptions following child birth.'* (Blundell et al., 2021, p. 1).

The gender wage gap remains a significant issue even in the most developed countries. Using the British Household Panel Survey, this paper investigates the role of work-related training as a tool to reduce the gender wage gap. The study's model looks at women who enter the labour market after completing education. The findings of the study allowed to raise an important question which will be addressed in a follow-up paper '<…why college graduates have such high levels of job training but little or no observed return' (Blundell, et al, 2021, p. 48).

1.3.2. Education and immigration

Margaryan, S., Paul, A., Siedler, T. (2021), *Does Education Affect Attitudes Towards Immigration? Evidence From Germany*, Journal of Human Resources, 56(2), p. 446-479. Available at http://jhr.uwpress.org/content/56/2/446.abstract

Key message: *'<…an additional year of schooling lowers the probability of being very concerned about immigration to Germany by around six percentage points (20 percent).' (Margaryan, et al., 2021)*

The authors use data from the German Socio-Economic Panel to investigate the impact that education may have on attitudes towards immigration. While the study finds no evidence for returns to education within a range of labour market outcomes, higher social trust appears to be a significant factor behind these findings. With the ever-changing demographic makeup of countries, it is vital to consider factors promoting tolerance and inclusion.

Tumen, S. (2021), *The Effect of Refugees on Native Adolescents' Test Scores: Quasi-Experimental Evidence from Pisa*, Journal Of Development Economics, 150, 102633. Available at https://www.sciencedirect.com/science/article/abs/pii/s0304387821000122

Key message: *'<…the labor market forces that emerged in the aftermath of the refugee crisis have led native adolescents, who would normally perform worse in school, to take their high school education more seriously.' (Tumen, 2021)*

Linked to the equality question discussed in the aforementioned article, this paper investigates the impact that refugee students have on native adolescents' test scores. The findings demonstrate that refugee inflows increase PISA test scores among native adolescents in Turkey. Furthermore, increased competition for low-skill jobs creates incentives for human capital investment.

1.3.3. Education efficiency

Dincă, M. S., Dincă, G., Andronic, M. L., Pasztori, A. M. (2021), *Assessment of the European Union's Educational Efficiency*, Sustainability, 13(6), 3116

Key message: *'<…efficiency appears to be achieved when education results such as PISA scores, attainment level or other value-added outcomes are reached with rather low levels of financial resources.' (Dincă et al., 2021).*

This study measures efficiency levels in different education levels both separately and together.

- **Primary education level:** the best performers are Sweden, Luxembourg and Greece.
- **Secondary education level**: Belgium, Finland and Romania were 100% efficient between 2006 and 2018.
- **Tertiary education level:** In 2018 (the last year of the study), The Czech Republic, Greece, Lithuania, Latvia, Bulgaria, Ireland, Malta, the Netherlands and Romania have been identified as efficient. The least efficient country is Croatia.
- **Total Education:** *'Estonia, Finland and Romania recorded the maximum efficiency score in three out of the five years; Ireland, Germany and Slovakia embraced efficiency in two years; Luxembourg only achieved maximum efficiency once, in 2009.' (Dincă et al., 2021).*

1.3.4. Teacher training

Beaton, M. C., Thomson, S., Cornelius, S., Lofthouse, R., Kools, Q., Huber, S. (2021), *Conceptualising Teacher Education for Inclusion: Lessons for The Professional Learning of Educators from Transnational and Cross-Sector Perspectives*, Sustainability, 13(4), 2167. Available at https://doi.org/10.3390/su13042167

Key message: *'<…educators require professional learning that is collaborative, interprofessional, and acknowledges that the challenges they face are multifaceted.' (Beaton et al., 2021).*

Europe is becoming increasingly diverse, and teachers are faced with new challenges that may prevent them from providing quality education for all. Professional training is needed to ensure that the education systems across Europe are inclusive for all.

OECD (2021), *What can schools and teachers do to help boys close the gap in reading performance?,* Teaching in Focus, No. 39, OECD Publishing, Paris. Available at https://doi.org/10.1787/bcbf795e-en

Key message: *Boys' have a lower performance in reading than girls due to disciplinary problems and lack of positive teacher-student relationship.*

Gender stereotypes play a vital and detrimental role in raising and socialising children. Projecting different roles and interactions leads to boys' lower performance in reading. This paper suggests that the key factors when minimising the reading performance gap between boys and girls are:

- Helping boys to tackle disciplinary issues.
- Making a better relationship between students (boys) and teachers.
- Creating a culture of assessment and accountability.

OECD (2021), *Adapting curriculum to bridge equity gaps: towards an inclusive curriculum*, OECD publishing, Paris. available at https://doi.org/10.1787/6b49e118-en

Key message: *When adapting the curriculum, countries must place importance on equity, equality, and inclusion.*

Curriculum innovations create new opportunities and challenges to education. When designing and implementing the curriculum, more emphasis must be placed on the diverse needs of students as well as on equity, equality, and inclusion. There cannot be a unified solution or general approach due to the various differences, as families' socio-economic backgrounds, family structures, migrant, ethnic or racial, minority, and indigenous backgrounds. The report describes the four curriculums, their advantages, and potential risks (digital curriculum, personalised curriculum, cross-curricular content and competency-based curriculum, and flexible curriculum). It also provides the key lessons learned from countries that adopted these four innovative curriculums:

- Use Universal Design for Learning as a checklist.
- Change the paradigm of 'learning and assessment' to favour the whole child and personal development.

- Expect both untapped opportunities and new risks in public-private partnerships.
- Avoid stigmatising personalised and cross-curricular content and competency-based curricula.
- Do not underestimate the resources required to close observable and non-observable equity gaps.

OECD (2021), *Delivering Quality Education and Health Care to All: Preparing Regions for Demographic Change*, OECD Rural Studies, OECD publishing, Paris. Available at https://doi.org/10.1787/83025c02-en

Key message: *Education and healthcare services must be accessible and available to everyone despite the geographical location.*

COVID-19 pandemic brought challenges to deliver crucial public services, like healthcare and education, to various geographical locations, especially to rural areas. It is hard to maintain quality services in rural areas due to lack of physical infrastructure, lack of skilled people as well as ageing and shrinking population. The report examines various nuances to services delivery in rural regions and analyses the digital connectivity and governance issues. It provides recommendations on how to make better accessibility of education and healthcare services. Below we list some examples of the key recommendations:

- Increasing the place sensitivity of service delivery (including the access to digital infrastructure).
- Tackling demographic challenges through innovation (increase efficiency and leverage on the latest digital technologies).
- Flexible approach to class sizes and regulatory matters (school network restructuring, multi-grade classrooms).
- Ensuring attraction, retention, and empowerment of teachers (digital skills, monetary incentives, exchange programmes).

1.4. Skills for sustainable competitiveness

Ferreras-Garcia, R., Sales-Zaguirre, J., Serradell-López, E. (2021), *Sustainable Innovation in Higher Education: The Impact of Gender on Innovation Competences*, Sustainability, 13(9), 5004. Available at https://www.mdpi.com/2071-1050/13/9/5004

Key message: *'<… female students present a high level of preparation for innovation-oriented action. These findings have educational implications for potentiating the innovation competences and environments where females can attain innovation skills.'* (Ferreras-Garcia, et al, 2021).

This study is one of the first of its kind and contributes to innovation and gender research. Furthermore, it confirms that gender is a key factor of innovation competence development and cannot be left out from the consideration.

Roczen, N., Fischer, F., Fögele, J., Hartig, J., Mehren, R. (2021), *Measuring System Competence in Education for Sustainable Development*, Sustainability, 13(9), 4932. Available at https://www.mdpi.com/2071-1050/13/9/4932

Key message: *'In this paper, we have presented the development and psychometric evaluation of a system competence test for the field of ESD. The test is characterised by the following properties: It is compact, easy to interpret, and yet reliable, and, thus, suitable to be included into international educational monitoring reports. Particularly, it can serve as an outcome indicator for SDG 4.7. However, it is also suitable for evaluating ESD measures. With these characteristics, we hope to contribute to a more effective promotion and assessment of system competence within the framework of ESD.' (Rozcen et al., 2021).*

Similarly to the research article above, this paper presents the development and psychometric evaluation of a system competence test for the field of ESD. According to the authors, when it comes to ESD, it is important to think critically, consider and examine the 'why' and dive into a deeper understanding of the issues. With this assessment system, the authors hope to boost competence within the framework of ESD.

UNESCO (2021), *Learn for Our Planet. A Global Review of How Environmental Issues Are Integrated in Education*. Available at https://unesdoc.unesco.org/ark:/48223/pf0000377362.locale=en

Key message: *To create a long-lasting change towards sustainability, education is crucial.*
The climate crisis is taking a major part in our lives, and the world faces the hottest year in history, yet the topic is not well analysed in educational curricula. When examining various sources that students are reading, a much greater focus on 'environment' than on 'climate change' or 'biodiversity' was noticed. There is a clear need to implement the inclusion of environment-related content in the teaching curriculum and raise awareness. The report provided recommendations:

- Place more emphasis on environmental themes in education, including climate change and biodiversity.
- Integrate environmental learning across the curriculum.
- Show the high-lever prioritisation of environment-related topics in the education sector.
- All teachers and school leaders should be versed in Education for Sustainable Development.
- Engagement with environmental issues should involve action within schools and by administrators.
- Indigenous knowledge should be better included in environmental learning.

UNESCO (2021), *Skills Development and Climate Change Action Plans: Enhancing Tvet's Contribution*. Available at https://unesdoc.unesco.org/ark:/48223/pf0000376163

Key message: *Countries needs to better implement TVET component in climate adaptation plans.*

In order to reduce the impact of climate change, countries need to implement climate change education. During the country submissions of national climate plans, it was noticed that 95% of reporting countries have included some climate change education content. However, it is clear that technical and vocational education and training (TVET) component should be strengthened in climate adaptation plans since in most of the cases there were no specific attention to TVET development required for climate change. From the good practices, the recommendations are:

- Ensure and strengthen coherence between a country's policies and ground-level actions via partnerships.
- Synchronise investments in jobs and skills.
- Develop TVET policies to ensure green growth.
- Establish cooperation with the private sector to incorporate industry skill needs.
- Undertake skills needs assessments and identify nation- and sector-wide requirements.

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Ferreras-Garcia, R., Sales-Zaguirre, J., Serradell-López, E. (2021), *Sustainable Innovation in Higher Education: The Impact of Gender on Innovation Competences*, Sustainability, 13(9), 5004. Available athttps://www.mdpi.com/2071-1050/13/9/5004

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