CHAPTER 1

The Relevance of Future Challenges to Education in Five Central Eastern European Countries

Balázs MUNKÁCSY and Ágota SCHARLE

List of Figures and Tables

Figures

Tables

SECTION 1.

Introduction

Post-socialist Central and Eastern European (CEE) countries face similar challenges with their education systems. The similarities stem partly from the shared legacy of Soviet-style education, and, more broadly, the economic and social consequences of their transition to market economies and democracies. Their inherited features (being small, open economies with immature democratic institutions) also make them similarly vulnerable to more recent global economic, political, and social challenges. However, as this study will show, their paths have also diverged in several, important aspects.

This synthesis study is part of the Future Challenges to Education project of the Democracy Institute of Central European University. It is designed to explore the regional aspects of eight future challenges to education (defined by Radó, 2020) and the adaptive capacities of CEE education systems. It translates these eight challenges into direct challenges for education, demonstrates their relevance in the East-Central and Eastern European context, and summarizes desired policy directions for overcoming these challenges. The study draws on other papers from the project: country-level analyses of Hungary, Poland, Romania, Serbia, and Slovakia, thematic reviews about gender, ethnicity, and information technologies in education, and a review of comparative statistics.[1]

The study is structured as follows. Section 1 outlines the analytical framework and provides context through a brief summary of the history of Soviet and post-Soviet educational tradition and reforms. Section 2 focuses on how the eight external challenges translate into direct challenges to educational actors and assesses the magnitude and preparedness to respond to direct challenges in the five countries based on statistics and the project's country reports. Section 3 contains regional and country-specific policy recommendations based on the discussion in Section 2. Finally, Section 4 outlines some areas where further empirical research is needed for a better understanding of the related problems and policies of public education in the CEE region.

1.1 Legacy of the socialist system

CEE education systems share some features that are the legacy of the structures established during the 1950s following the Soviet example (Silova 2009, Mincu 2016, Gawlicz and Starnawski 2018). Despite several reforms before and after the regime change in 1989, this legacy can still be traced in the mindset of policy makers, teachers, and parents, and also in the institutional setup and day-to-day practice of these systems.

1. The country reports and thematic papers are available at https://cps.ceu.edu/research/educ. The statistical review was prepared by Dániel Horn. The paper also benefitted from valuable comments from Ágnes Kende, Péter Radó, Dorottya Rédei, Márton Csillag, Lucian Ciolan, and Mihaela Stîngu. Section 4 draws on informal discussions with Márton Csillag, Daniel Horn and Balázs Váradi.

Under a Soviet-style educational regime, the activities of schools were subordinated to the goals of the Communist state (or more precisely, the Communist party). This implied a commitment to equal access for all, but also strong state control over curricula, teaching methods, the institutional setup, and school choice. Curricula focused on socialist ideology and skills related to the needs of the economy, while teaching was teacher-centred. The pre-war system, in which schools were run by the state, local governments, or the church, and enjoyed considerable autonomy, was replaced by a hyper-centralized system of public schools. Though CEE countries followed diverging paths during the Socialist era and especially after the regime change in 1989 (Mincu 2016), they still seem to share some attributes that permeate their current systems. First, the notion that schools are meant to turn children into useful subjects, rather than enable children to develop, even when not explicitly imposed by central curricula, continues to guide policy makers, teaching practices, and to some extent, parents' expectations. Second, though the ownership structure of public education has become more mixed in some countries, state control and public management/funding has remained almost complete in the region, as opposed to in many Western countries where private schools make up a notable share of the total. In most countries, the near monopoly of the state on primary and secondary education is also coupled with highly centralized and bureaucratic governance and the limited autonomy of schools.

A further, more general legacy of the Socialist era is the relative inefficiency of public administrations and the weakness of civil society and democratic attitudes, which reduce the incentive and ability of governments to undertake and implement successful reforms in public education. Public administration tends to be over-politicised and unstable, which decreases the general quality of decision making and especially the capacity to implement complex reforms spanning several years. The weakness of civil society in post-socialist countries reduces their potential to hold their governments accountable and press them to improve the quality of decision making. With little pressure from civil society, and considering the fact that the benefits of educational reforms can seldom be reaped within a four-year political cycle, CEE governments typically launch reforms at the initiative of highly committed experts-turned-politicians.

Attitudes towards gender roles are also shaped by the Socialist legacy, which granted equality in the workplace, and established care facilities to support working mothers, but did not promote the empowerment of women nor confront the traditional division of roles within the household (Szikra 2010).

1.2 Education reforms of the Post-Soviet era

The following paragraphs will attempt to give a concise overview of trends in education reforms in the region following 1989. This text should be taken only as a rough outline—the case of each country is complex, and will surely not closely follow the structure of reforms described below.

After the regime change, education reforms in post-Soviet countries typically came in three waves.

The first wave started in the 1990s, and brought about mostly macro-level changes concerning decentralization and the independence of educational management and administration, while also introducing new, national curricula. The exception is Serbia, where decentralization only started a decade later, in 2003 (about three years after Milošević was removed from office).

The second wave of reforms (~2000s) introduced regulatory institutions for the decentralized systems with the expansion (or establishment) of national testing, school and teacher evaluation (usually in the form of self-evaluation), and the better availability of public data on education (both nationally and internationally through OECD and EU assessment initiatives). This second wave was also typically accompanied by attempts to make education more inclusive, and a shift of focus in the national curriculum away from teaching materials towards learning outcomes. In these reforms, Poland led the way with the most ambitious and also most effective policy changes: delayed tracking led to greater inclusivity and an increase in school autonomy, while the strengthening of pedagogy as a profession enabled teachers to improve themselves and focus on the development of children. The Hungarian initiative of promoting integrated education for disadvantaged children, though short-lived, also achieved measurable positive impacts.

The third wave started at varying times during the 2010s when making progress with education policy mostly fell off governments' and the public's radar. Policy makers and governments generally started to show signs of a lack of clear vision concerning how they wanted to improve the education system, and evidence-based policy making basically disappeared from politics. In Hungary and Serbia, the past decade has led to drastic centralization that has threatened or destroyed the integrity and autonomy of schools. In the other three countries, the education system has stayed decentralized (despite the Polish government's efforts to increase its power over schools).

1.3 Four spheres of external challenge to education systems

In the conceptual paper for this project, Radó (2020) defines eight disruptive changes (sometimes called 'future challenges') to education systems. These challenges may be sorted into four broader categories (Table 1), based on their potential impact on education. Challenges belonging to the same category are similar in the sense that they require the same kinds of responses from schools and educators. For instance, students who are taught how to learn and improve themselves will be able to adjust more easily to technological changes, new forms of work, or working in international environments as adults. Similarly, more inclusive schools where pupils are taught to accept and embrace dissimilarity will prepare pupils for the consequences of all manners of inequalities.

The eight challenges are still important to keep in mind, especially when their impacts overlap, as these are precisely the areas where the pressure on public education systems may be the strongest. For a more detailed overview of how the eight challenges affect schools and teachers, see the 'Challenge Matrix' (Table A1) in the Appendix.

Table 1 ▲ Generalization of the eight challenges to education systems

Sphere	Challenge
Political	Populism, autocratic regimes
Economic	Technological changes
	Transformation of labor markets
	Globalization,* internationalization
Demographic and social	Demographic changes, migration
	Old and new inequalities
	Changing gender roles
Climate change	Climate change

* Globalization has impacts that go beyond the economic sphere, such as migration or the standardization of cultural expressions around the world. These are either included in other spheres (such as migration in the demographic sphere) or were considered to have a relatively small impact on public education in CEE.

The nature of these challenges is likely to be similar across CEE countries. The new political elites of CEE countries may be more tempted to take a populist turn, while their new-born democratic institutions and weak civil societies may be less able to fight back compared to in more mature democracies. CEE countries are small, open economies with a relatively highly skilled labor force, but a low level of capital: these features make them similarly vulnerable to global economic trends and technological change. They all went through the transition experience, which involved a rapid rise in wage returns on education and reduced fertility for at least a decade.

The next section discusses cross-country variation in these four broad spheres of challenges, considering both the magnitude of each external challenge and the status-quo in the relevant parameters of the education system (i.e. the distance between current and ideal states).

SECTION 2.

Direct Challenges to Education and Their Importance for CEE Education Systems

The challenges identified in the previous section may impact various aspects of education systems. Five such aspects are distinguished: the accessibility of public education, skills to be acquired, knowledge to be taught, teaching methods, and governance—while the latter could be further split into school-level, local-level, and country- or international-level governance. For each of the four main spheres of external challenge, this paper shows how it may impact education, and then presents the actual trends observed in the selected CEE countries.

This section will translate the four challenge categories introduced in Table 1 into direct challenges for teaching professionals, for school management, and for governmental education management institutions. The aim is to make these challenges palpable for all actors of education. Each challenge category is also evaluated in terms of its relative weight for each country, and the countries' preparedness to deal with them. The discussion cumulates into a rating that highlights the relative overall importance of the direct challenges to each country.

To give some context to these comparisons, two benchmark countries are used. First, Estonia is used as a point of reference: the latter is a post-Soviet country that started from a similar historical and economic position as CEE countries in 1989, but which ultimately achieved a Scandinavian level of education outcomes by the second half of the 2010s. The second benchmark is Austria: a country with a similarly structured education system to Hungary or Slovakia, but typically somewhat better educational outcomes and more stable democratic and other social institutions.

2.1 Political challenges

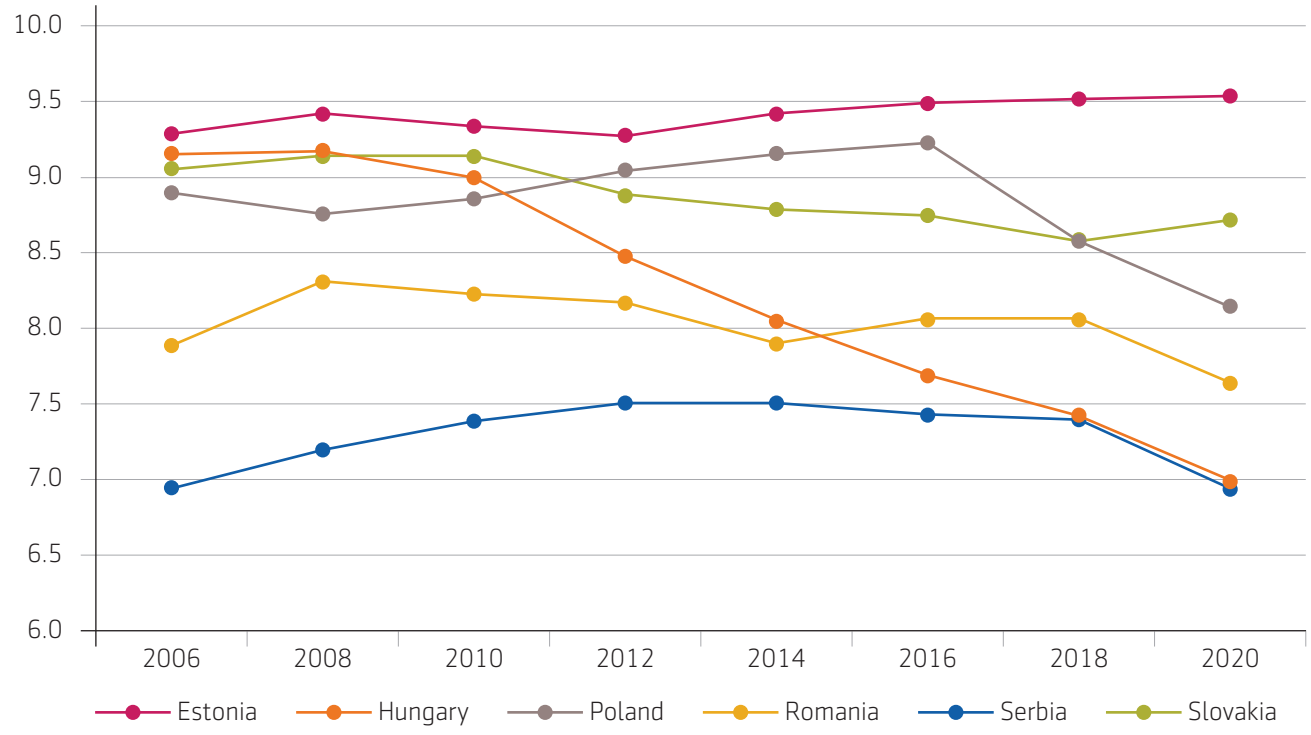
The rise of populistic-autocratic regimes in the region puts schools and educators in a key but vulnerable position. These regimes tend to make attempts to (further) centralize education systems (as happened in Hungary, Poland, and Serbia). This, combined with the fact that in the region schools traditionally have low levels of fiscal autonomy, makes them very susceptible to governmental pressure. This is highly problematic, since in the region's deeply flawed democracies evidence-based policy making is substituted by symbolic, ideology-based or populist politics that prioritizes short-term popularity over long-term solutions. This means that unpopular policies (for example, the integration of minority groups, or increasing the access to education of children from poorer families, etc.) are swept under the

rug by default. In more severe cases, this kind of politics can turn education into a cultural battlefield for ideological indoctrination, increasing the pressure on schools and teachers to give up their institutional and professional integrity, and simultaneously undermining the education of democratic values and civic knowledge.

The existence of these regimes increases the need for critical thinking and media literacy to counter the "large amount of communication-related background noise through which facts are replaced by the pretense of the day" (Radó, 2020; Pomerantsev, 2019). This puts conscientious teachers in a precarious situation where they (righteously) feel strong responsibility to help students acquire the aforementioned skills but are also pressured by the government, the school, or even by their peers, to stick to delivering the narrowly defined educational material on the (national) curriculum.

Three indices are used to capture the severity of this political issue in our sample of CEE countries. First, according to Freedom House Index (Figure A1, Appendix), which comprises multiple indices (concerning Electoral Process, Political Pluralism and Participation, the Functioning of Government, Freedom of Expression and Belief, Associational and Organizational Rights, Rule of Law, and Personal Autonomy and Individual Rights), Hungary and Serbia have seen a steep decline in political rights and civil liberties in the past decade, while Poland has experienced a moderate one. As of 2020, Hungary and Serbia are considered only 'Partly Free' (i.e. have a score of 70 or less).

Figure 1 ▲ Democracy Status Index (Bertelsmann Stiftung)



Source: https://bti-project.org/en/home

Next up is the Bertelsmann Stiftung Democracy Status Index (Figure 1), which is also a summary of other indices (covering stateness [e.g. monopoly of force, interference of religious dogma], political participation, rule of law, the stability of democratic institutions, and political and social integration), and is measured on a scale of 1 to 10.[2] Currently, all of the countries in consideration are labelled 'defective democracies' except for Slovakia. It should be also mentioned that the situation has been worrying in Hungary and Serbia for a while now (see Figure 1), while Poland and Romania are more recent members of the 'defective democracy' club.

Another way to approach this issue is to look at the political landscape of each country. The Populism Tracker (Figure A3, Appendix; created by the Foundation for European Progressive Studies) is an index (and a yearly report) that tracks the popularity of populist parties among likely voters in the EU based on national opinion polls.[3] The tracker shows that Hungary has the highest potential populist vote share, but Poland is catching up quickly. Slovakia has a comparatively small share of potential populist votes and Romania has none (as none of the parties are considered populist in the country by the experts of the Foundation for European Progressive Studies).[4] Though the Foundation for European Progressive Studies focuses solely on EU countries, the Serbian Progressive Party (which won 60.65% of the popular vote in 2020) is also widely considered to be populistic.

The preparedness of national education systems for this particular challenge manifests in the resilience of schools and a tendency for education systems to make rushed, forced policies. This resilience is fuelled by financial and professional independence. The OECD's TALIS questionnaire asks principals about their school's autonomy in relation to determining salary increases or bonuses for teachers. In Romania, 8% of schools have a say over the wages of teaching staff, while this number is 19% in Hungary. These results are both lower than the OECD average (32%). In Slovakia, however, 44% of principals reported having this kind of autonomy. The Slovakian EDUC report identifies weak fiscal autonomy as a potential problem, but only because all other aspects of school autonomy are better established in the country, and autonomy in relation to salary increases has diminished since 2013. The Polish report emphasizes the issue that school principals in the country do not have a pool of finances that they may freely allocate to staff expansion (which ended up being a huge issue during the COVID-19 pandemic, when schools could not hire technical coordinators or IT professionals), and the fact that Polish schools are 'cost-efficient' to the extent that one could easily argue that they are in fact underfunded. The Serbian report also highlights the almost total lack of fiscal autonomy of school management, who have no influence on teachers' salaries.

Considering professional independence, in Slovakia and Hungary the state-defined mandatory curriculum framework is so detailed and extensive that it virtually eliminates autonomy related to teaching material. Besides this, Slovakian schools are more autonomous (and therefore resilient) than

2. A country with a score of 8–10 would be considered a consolidated democracy, while a score of 6–8 indicates that the country is a defective democracy. Countries scoring less than 6 are considered highly defective (or outright autocratic).
3. Of course, this categorization of parties is somewhat arbitrary (check The Progressive Post's website for documentation).
4. The data does not show the emergence of the AUR party (Alliance for the Union of Romanians), a populist party that gained appr. 9% of the votes in the 2020 Romanian Parliamentary elections.

other OECD countries. In Hungary, however, the current education system is highly centralized (the most centralized in the region, if centralization is measured by the percentage of decisions made at the central or regional level), and organizational and professional autonomy is mostly reduced to symbolic functions. The Serbian system is also centralized, but principals have a relatively high degree of autonomy over the recruitment and dismissal of teachers compared to in the other four countries. Romania's case is somewhat unique in the sense that the country's education system tries (or has tried) to grant schools more autonomy on multiple levels, but these attempts have not succeeded so far. The Romanian report states that school boards (composed of the representatives of stakeholders, including teachers, administrative staff, parents, and the local government) have failed to take on responsibilities outlined by the Education Law of 2011, such as the recruitment of the principal and disciplinary action related to teaching staff. Meanwhile, schools do not take advantage of the regulation which allows them to choose up to one-third of the curriculum. Finally, Polish teachers have a high degree of professional autonomy and are basically free to determine how they want to teach children—as long as the latter perform well on the national examinations at the end of their studies. The school system is decentralized, and while there have been some attempts by the current government to limit school autonomy, they so far have not had a considerable impact.

To sum up, the political challenge will be the most difficult to overcome in Hungary and Serbia, where democracy is in a poor condition, there is high exposure to populist policies, and the financial and professional autonomy of schools and teachers is low. The situation is somewhat better in Romania, where political rights and civil liberties are less damaged and populist parties are not represented in politics, but there are some worrying trends in terms of the state of democracy. Romanian schools' fiscal autonomy is extremely small, and attempts to establish greater professional autonomy have not been successful. Poland and Slovakia seem to be the most resilient to authoritarian and populistic pressures due to the high professional autonomy of schools (in Poland), or their strong fiscal independence (in Slovakia).

Table 2 ▲ The relative weight of political challenges for each country

Challenge aspect/measure	Hungary	Poland	Romania	Serbia	Slovakia
State of democracy					
Populist policies					
School resilience					

The colors indicate very severe challenges, severe challenges, and moderate challenges considering how prepared countries' education systems are, and how severe the challenge is expected to be for them. See details in the preceding paragraphs.

2.2 Economic challenges

Three of the disruptive changes defined by Radó (2020) can be labelled as some sort of transformation of global markets impacting teaching content and the way educators have to teach. These are: the second wave of globalization, the emergence of digital technologies, and shifts in the labor market resulting (mainly) from automation. Schools must prepare students for multilingual workplaces where work takes place in online environments (potentially as often as in office spaces), with positions and tasks that might not even exist today and that continue to change. These challenges have been with us for a couple of decades now, highlighting that the adaptation of education systems is much slower than desired.

The globalization of work and trade requires cooperation on an international level. There is an increasing need for foreign language skills and high intercultural competence. Students could benefit not only from learning foreign languages but from becoming familiar with local, regional, and global cultures, heritage, and traditions. This includes skills such as having empathy towards people of different cultures, the ability to express one's self through international (social) media, etc.

Labour market researchers agree on the notion that automatization/robotization does not endanger entire occupations, but rather certain types of work-related tasks. More precisely, only some tasks can be automated (or programmed): these are typically routine tasks conducted by semi-skilled workers who receive moderate wages (who are usually women). Therefore, a decline in the demand for routinized work is to be expected. This means that low-skilled workers in the service sector whose work-related tasks require a high level of soft skills (e.g. bartenders and hairdressers), and highly skilled workers who undertake creative and abstract tasks requiring good basic competencies (e.g. programmers and educators) will have a relatively more stable position in the labor market. Education will therefore have to focus on widely applicable key competencies, with a special emphasis on the personal, social, and learning-to-learn competence.[5] Noteworthy teaching practices that allow students to develop their personal, social, and learning-to-learn competence include learning-by-doing-style tasks, group work, case studies, flipping the classroom, long-term projects, peer editing/feedback, and so on. Students need opportunities to work in small groups to come up with joint solutions to problems, to work on projects that require at least one week to complete, be asked to decide on their own procedures for solving complex tasks, and be presented with tasks for which there are no obvious solutions. These are all teaching practices accounted for by the OECD's TALIS assessment.

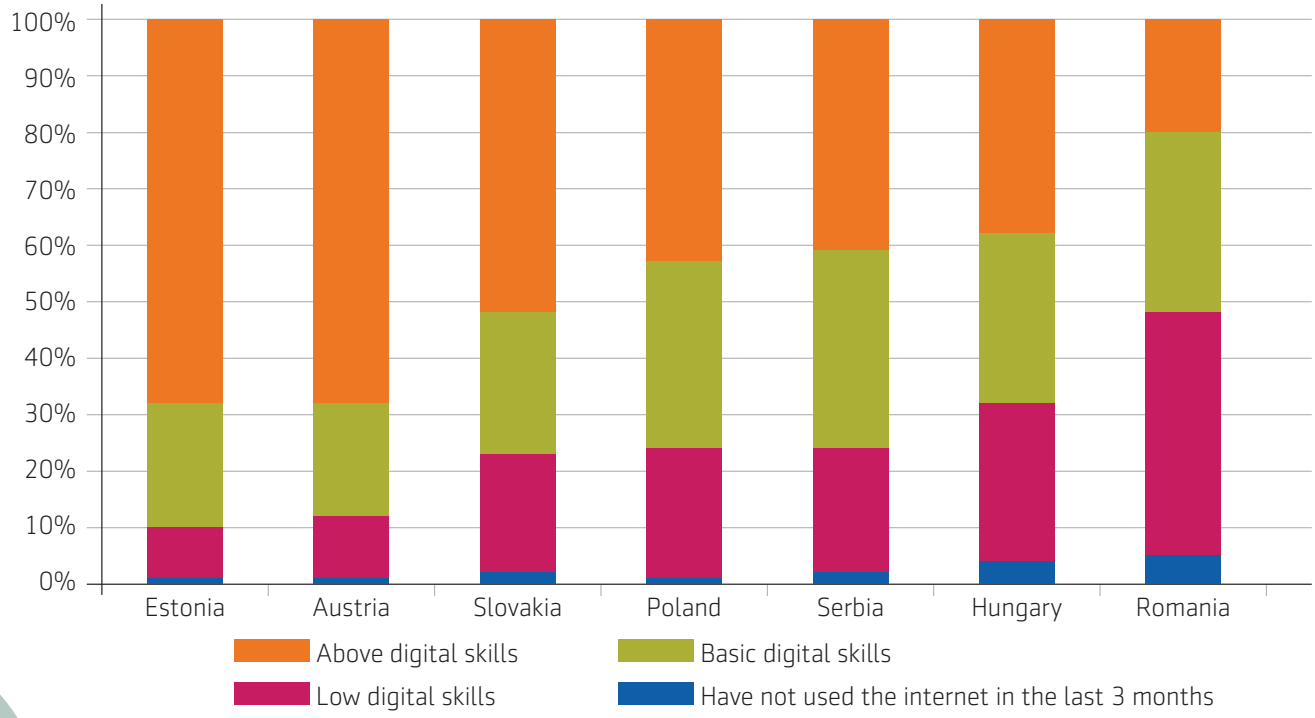
These challenges may be coupled with central pressure for suboptimal policies. Even non-populist governments can be lobbied into focusing resources on pure vocational training, as companies often frame short-term vocational labor shortages (a short-term problem) as the primary obstacle to further development. While the need for skilled blue-collar workers is real and should be addressed, governments should think further in the future and aim to solve long-term, more fundamental challenges (such as the ones discussed in this study) when it comes to educational development.

5. The other areas of key competence include: literacy, multilingual competence, mathematical and scientific competence, digital competence, competence in citizenship, entrepreneurship, and cultural awareness and expression.

A variety of data sources[6] will provide the basis of the evaluation of the preparedness and exposure of CEE education systems to these changes in global markets.

Starting with digital skills, the European Social Survey has a regular ICT use element which shows that in 2019 all the studied countries fell behind both benchmark countries in terms of digital skills (Figure 2), with Slovakia performing the best and Romania the worst. This means that East-Central and Eastern European societies are probably not well-prepared to switch to a more digitalized style of work, or, to put it differently, the weight of the digital challenge is relatively high in all countries (though a little less so in Slovakia, and more so in Romania and in Hungary). Meanwhile, the OECD's TALIS questionnaire shows that Romanian and Hungarian teachers need to improve their ICT skills more than Austrian or Estonian teachers (Figure A3, Appendix), and schools report a shortage or inadequacy of digital equipment more frequently in Slovakia, Hungary, and Romania than in the benchmark countries. The COVID-19 pandemic can be regarded as a case study for the digital preparedness of education systems. Generally, the pandemic has revealed that the digital competence of teachers and students is severely lacking, that teachers do not want to / know how to apply effective digital teaching methods, and that education management has no idea how online education might work and what kind of support it requires. The EDUC country reports describe insufficient or inappropriate reactions on the part of central management, with the main types of support being lessons broadcast on TV (in Serbia and Poland), the provision of access to often insufficient or not user-friendly online educational platforms (such as the Hungarian E-Chalk system), and teaching guidelines on how to adapt to the situation (e.g. in Slovakia). However, the kind of flexible financial aid that most schools would have needed to adopt quickly to the changes was not provided.

Figure 2 ▲ 16–29-year-olds' level of digital skills, ESS 2019

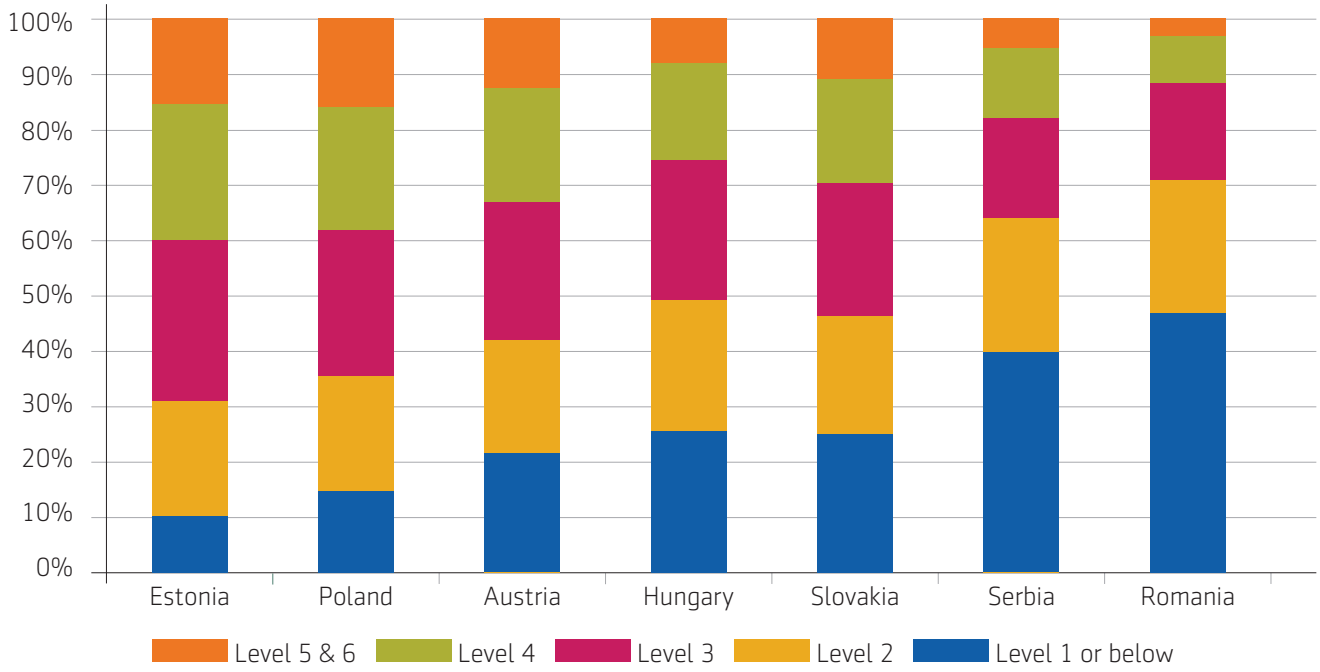


Source: European Social Survey (2019)

6. European Social Survey, the Adult Education Survey, the European Skill and Jobs Survey and the TALIS questionnaire.

Moving on from ICT skills, there are some basic competencies that will continue to be relevant for a wide range of jobs. These include reading and mathematical competence. Based on the 2018 PISA results (see Figure 3 for results in Mathematics), test countries can be sorted into three categories: the best performing countries consistently score above 500 points in the test (one of these is Poland, for instance), mid-performing countries have average scores of between 500 and 450 (these are Hungary and Slovakia in the region), while countries with mean scores below 450 can be regarded as low-performing (Romania and Serbia).[7] Looking at the distribution of scores within each country, one can see that the average PISA score in these low-performing countries is dragged down by a large share of low achievers (those below level 3 on Figure A4 in the Appendix).[8]

Figure 3 ▲ Results from PISA 2018: Mathematics



Source: Program for International Student Assessment (2018)

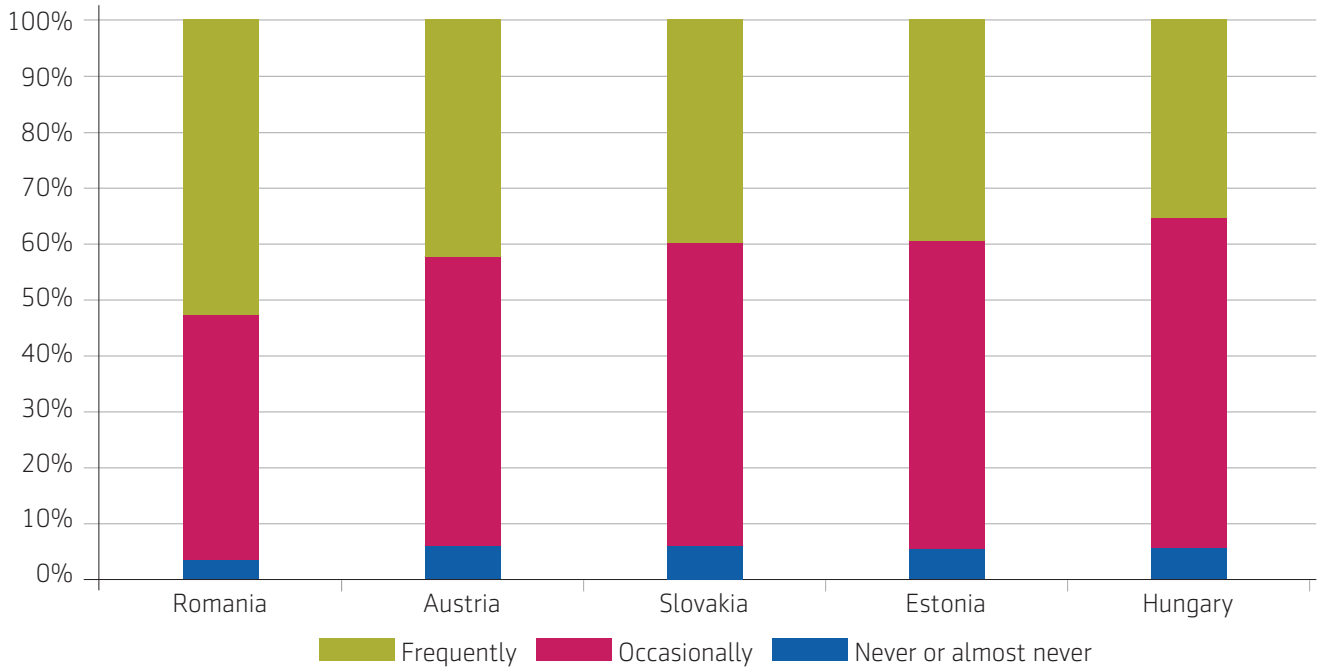
The TALIS questionnaire also reveals that teachers in Hungary and Slovakia are less likely to assign long-term projects or group exercises to students than the OECD average, while teachers in Romania preform somewhat better than average in this aspect (in 2018, and around the avg. in 2013). (These data refer to a randomly chosen class from the weekly timetable of each teacher.) Similar TALIS data

7. It should be noted that this categorization is widespread but arbitrary, and one might easily argue that performing, for example, at around 450–470 points on average is a terrible result for a country's education system, and should not be labelled mid-level.

8. In the case of mathematics, for instance, one can define low achievers as those who do not reach Level 3 (482 points). These people are typically unable to draw indirect inferences and are incapable of solving problems with sequential decisions. They usually have trouble extracting information from more than a single source and generally do not know how to work with percentages, fractions, decimal numbers, and proportional relationships. High achievers, on the other hand, are those at Level 5 and 6 (606+ points). These students can work with models for complex situations, identifying constraints and specifying assumptions. They work independently: decide on the appropriate ways to solve a task, and they are also good at presenting their results, interpretation and reasoning.

from 2013 are available for Poland and Serbia as well: they show that both Polish and Serbian teachers use fewer of these techniques than the OECD average. This shows that there could be potential to improve the preparedness of CEE education systems for the shift away from routinized work on labor markets. However, in these dimensions the benchmark countries perform similarly to the studied countries, indicating that good practices for group and project-based learning might be more difficult to establish in post-socialist or post-Austro-Hungarian-Empire countries (see Figures 4 and A5 & A6 in the Appendix). Romania may be in a slightly better position than the other countries; however, this advantage cannot be exploited while basic skills education remains insufficient.

Figure 4 ▲ Students work in small groups to come up with joint solutions

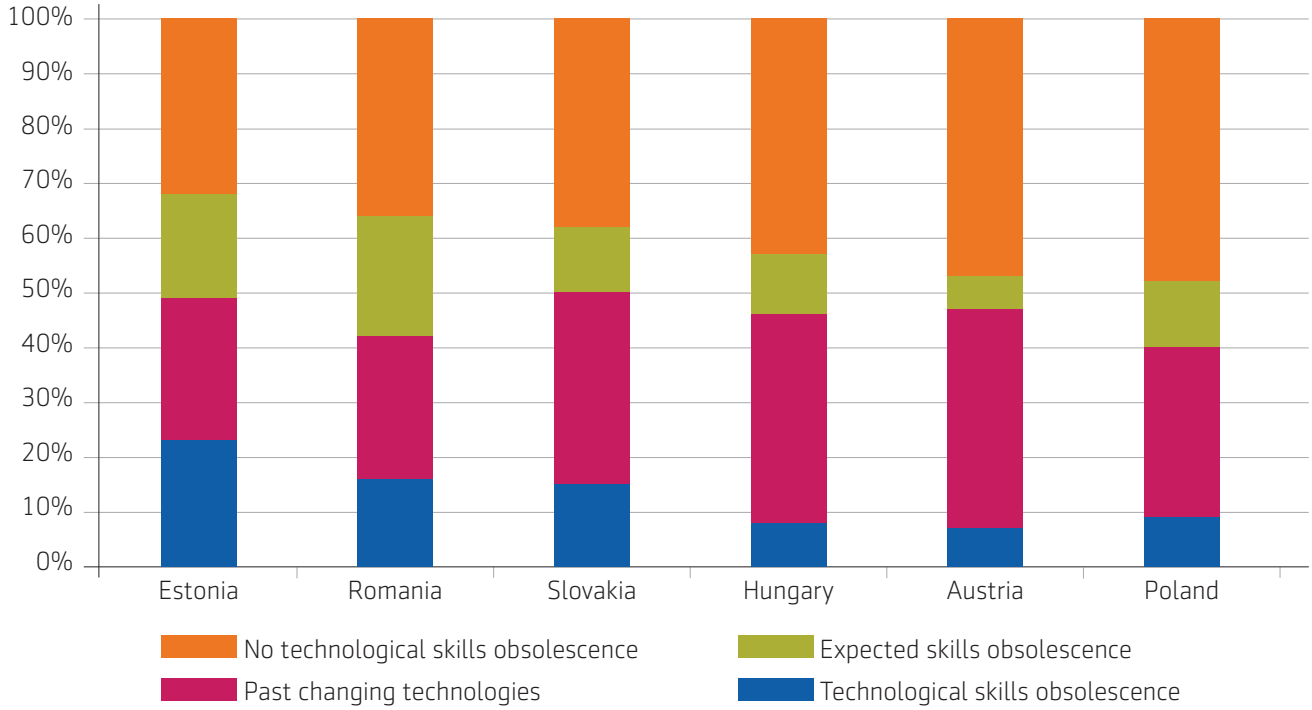


Source: Teaching and Learning International Survey (2018)

It is not straightforward assessing the weight of the challenge of automatization for a given country, and data on this topic is scarce. What one can derive from the few studies that try to assess this problem on a country-by-country basis is that the countries in the region are impacted very similarly. In an analysis of the 2014 European Skills and Jobs Survey, the European Centre for the Development of Vocational Training concluded that—among other countries—Hungary, Poland, Slovakia, and Romania have a working adult population with technological skills that will become obsolete due to expected or occurring technological changes (Figure 5). In a more recent study from 2018, McKinsey & Company labelled Hungary, Slovakia, and Poland countries with very high automation potential within the EU (Figure A7, Appendix);[9] however, they also highlight that public attitudes towards automation are much less accepting than with digital front-runners such as Denmark or the Netherlands, and that low labor costs decrease the economic incentive for automation.

9. The study did not include Romania or Serbia.

Figure 5 ▲ Share of adult employees at risk of technological skills obsolescence, 2014



Source: European Skills and Jobs Survey (2014)

The final challenge from the changes in the global markets that requires some country-level assessment is the globalization of trade and work. These countries all have small and open economies in which lots of foreign companies are present on the labor market. These firms generally offer higher wages but demand foreign-language skills and intercultural openness. One easy (if perhaps overly simplistic) way to assess countries' preparedness for this challenge is to compare the proportion of citizens who speak at least one foreign language. Here, the analysis focuses on 25-to-35-year-olds who were educated after the regime change. Data from the 2016 Adult Education Survey (Figure A8, Appendix) indicates that Hungary and Romania are among the countries with the smallest share of young foreign language speakers in Europe. This indicator shows a brighter picture for Poland and an even brighter one for Serbia and Slovakia. There is reason to believe, however, that the language situation is not as good as the data suggests. Most statistics about language for these countries are distorted by the fact that the Slavic languages usually have very close relatives (such as Slovak and Czech, or the Croatian and Serb languages) that are so similar to each other that learning one while being a native speaker of the other might not increase one's language skills noticeably.

Table 3 ▲ Relative weight of economic challenges for each country

Challenge aspect/measure	Hungary	Poland	Romania	Serbia	Slovakia
Basic skills (reading, mathematics)					
Digital skills					
Personal and learning to learn competencies (~flexibility skills)					
Foreign-language education					

The colors indicate very severe challenges, severe challenges, and moderate challenges considering how prepared countries' education systems are, and how severe the challenge is expected to be for them. See details in the preceding paragraphs.

2.3 Social challenges

The next block of disruptive changes outlined in Radó (2020) could be labelled challenges arising from (changing) societal structures. This includes the problem of an aging society and the emigration of young people, regional differences, changing gender roles, and differences in ethnicity, language, sexuality, religion, wealth and social status. These issues are often difficult to deal with as they tend to be divisive, highly politicized, structural problems.

The (over)reaction of political actors to these challenges can lead to regressive or outright disastrous consequences. For instance, a decline in pupil numbers could be regarded as a threat to teachers' jobs or schools' existence and lead to defensive, conservationist policies, limiting the scope of adaptation for both schools and the education system as a whole (Radó, 2020). However, this should not be the only possible outcome. Central educational management could also see this as an opportunity to reduce the pupil-to-teacher ratio, to train teachers, and enable them to teach collaboratively, helping them practice differentiation in the classroom.

The EUROPOP2019 prediction (Figure A9, Appendix) shows that all five of the countries under analysis are likely to witness a great drop in their population by 2100. Poland and Romania are projected to be impacted the most relative to their populations. Due to these demographic trends, the pupil-teacher ratio (Figure A10, Appendix) is expected to decline in every country, but most prominently in Poland and Romania. If teacher numbers do not decrease significantly, this will mean that Romanian primary schools will have a pupil-teacher ratio that is closer to the current OECD average (~13). However, this number in Poland is already quite low (~10 in 2014, no data since), which makes this demographic challenge extremely relevant for the Polish education system.

One way to look at the equitability[10] of an education system is to assess how inclusive it is regarding younger (3–6 years) and older (14–20 years) students. An education system that fails to enrol and keep children in school punishes families with disadvantaged backgrounds by not allowing family members (typically, mothers) to work (as they have to look after their children), and by not giving children the education necessary for obtaining higher-paying, more motivating jobs. In terms of early childhood education, the Hungarian system performs the best, with >85% coverage in 2018, even for three-year-olds (see Figure A11, Appendix). Serbia has the most serious problem with early childhood education with less than 60% of six-year-olds enrolled. The case of older students more-or-less mirrors the compulsory schooling age in each country. In Poland, schooling age is 18, hence the drop in the proportion of those enrolled at 19. Romania has problems keeping children in school (or enrolling them in the first place), and student numbers clearly start to decline after 14 (which is the compulsory schooling age in the country).

Table 4 ▲ Compulsory schooling age in the five CEE countries and two comparison countries

Austria	Estonia	Hungary	Poland	Romania	Slovakia	Serbia
15	17	16	18	14	16	14.5

Other indicators suggest that the problem of education inequalities induced by differences in wealth, social status, and ethnicity (especially in the case of Roma) are severe in CEE countries. The proportion of disadvantaged students who score in the top quarter for reading performance in their own country (aka. academic resilience; see Figure A12, Appendix) is small in all countries in the region except for in Serbia (which performed slightly above the OECD average). Low academic resilience among disadvantaged students is an especially prominent issue in Hungary, Romania, and the Slovak Republic. In Serbia, the literacy performance of students from disadvantaged backgrounds is around two years behind other students in their cohort, and this number is similar for other countries in the region as well (PISA, 2018). The capacity of schools to compensate for a disadvantaged family background is typically very low in Hungary, Romania, and Slovakia (Figure 6). In Hungary, Romania, Slovakia, and Serbia the impact of a disadvantaged background is transmitted through the social status of schools, meaning that students with a less advantageous family background are more likely to get into less prestigious schools, which also has a negative impact on their levels of competencies (see the PISA 2018 results for proof).

Not only did the COVID-19 crisis indicate the lack of digital preparedness of schools in CEE countries, but it also put the digital divide in society into the spotlight. Preliminary (local) research suggests that in each country a significant share of students lacked sufficient access to education during the first year of the pandemic. In Serbia and Hungary, a substantive portion of pupils with multiple disadvantages, students with special education needs, and Roma students were either not included in distance learning or were delivered paper materials to their homes and received no further tutoring.

10. Education equity (i.e. making sure that every student gets the support necessary to achieve a minimal level of educational success) is an important issue not only from a social justice point of view but also because it increases social efficiency by allowing talented students from low- and mid-income families to use their skills in occupations where they can be both happier and more productive.

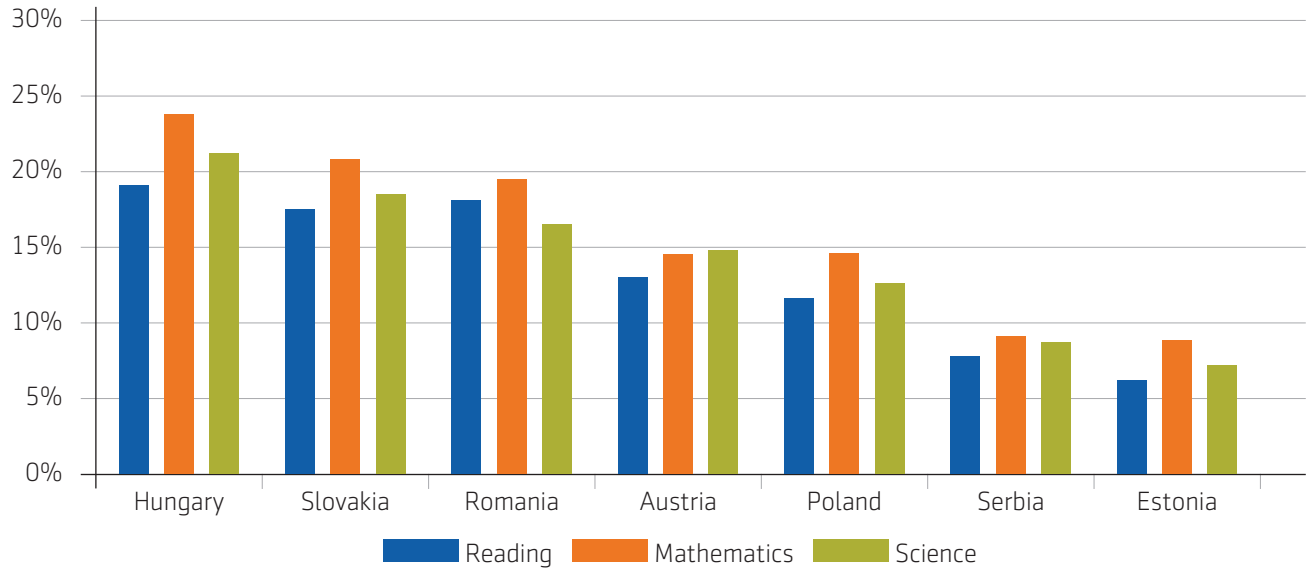
In Warsaw, optimistic estimates suggest that 15% of students did not participate in most online lessons during the first and second waves of the pandemic, and there is some evidence that it was a widespread practice to overload children with homework-like independent work without sufficient support from teachers. The same type of homework-based teaching practice was reported for the first wave in Slovakia as well, with an estimated 7.5% of students not receiving distance learning nationally.

Ethnic inequalities are often interwoven with inequalities in social status and wealth. The most obvious example of this interconnectedness is the case of Roma people in most of East-Central and Eastern Europe. Roma students usually come from low-SES families, are overrepresented in special education schools/classes, and are usually far less likely to enrol in secondary education than their peers.

These social status-based, wealth-based, and ethnic inequalities are correlated with regional differences, but they are not the same thing. Typically, rural schools are smaller, with lower student-teacher ratios, fewer socio-economically advantaged students, are more likely to experience staff shortages, and usually have less talented / qualified teachers than those in urban areas (OECD, 2013a). The rural-urban educational divide is especially prominent in Romania, where 25% of students in the countryside aged 18–24 leave school early (compared to 15% in towns and 4.2% in cities), and in Serbia, where in 2013 the dropout rate from primary education was a whopping 14.25% in rural and only 1% in urban areas, while students who attended schools in cities scored 122.3 points higher on average than those in rural schools. There are three main challenges to overcome in rural schools: *distance*—schools may be far away from students' homes both in terms of kilometres and in commuting time; *the smaller pool of teachers* leads to less qualified teachers; and a *shrinking number of students* caused mainly by migration to urban areas. Echazarra & Radinger (2019) propose context-specific policies for ensuring high quality learning for rural students. For example, creating rural-context-specific training and professional environments for spreading good practices for rural education are both crucial for keeping teachers in schools and helping them develop and be more effective in classrooms. Also, policies that promote ICT use in schools and distance learning can ensure the involvement of students who live far away from their schools—while also helping them live healthier lifestyles and sleep more. Students should be enabled and encouraged to take part in secondary and tertiary education through a variety of support services such as "scholarships, allowances, social and emotional support, career guidance and counselling, and boarding and housing" (Echazarra & Radinger, 2019). Finally, these and all other education policies should be adjusted to local features such as the type of rurality, teaching capacity, and school leadership capabilities.

These alarming symptoms of different, interconnected inequities and the digital divide do not suggest much optimism about the ability of CEE education systems to create paths for mobility. There is one exception—which is also the main source of hope: Poland, where two waves of comprehensive education reforms (1997–2001 & 2007–2011) increased learning outcomes for low-achievers substantially. These reforms, among other things, delayed entry to tracked education (specialization) to the age of 15, extended the period of comprehensive schooling, introduced vocational education reform, and increased both school and teacher autonomy.

Figure 6 ▲ Variation in reading, matematics and science score explained by ESCS, PISA 2018 (%)

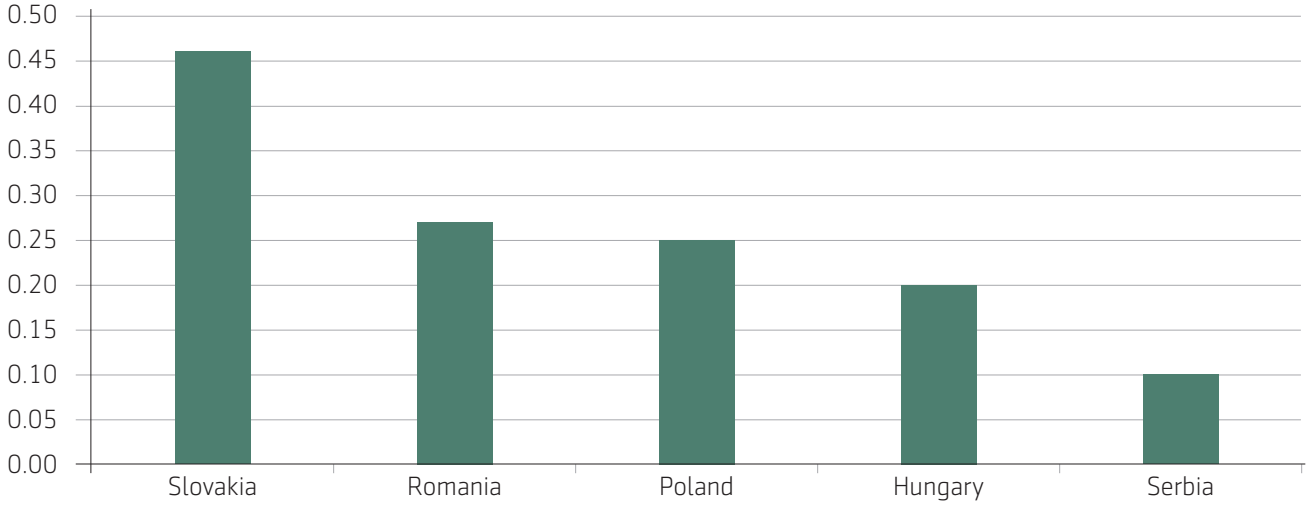


Source: Program for International Student Assessment (2018)

From a gender perspective, there are three major facets of inequalities (based on Kende, 2020a): learning performance differences (measured by standardized tests), differences in learning pathways, and socialization. These issues are of course interconnected, and they require adequate responses from both teachers and institutions. Some major differences in learning performance can be measured by data from PISA: country-level gender differences from 2018 show that girls have better reading skills than boys (Figure A13, Appendix), while boys have better mathematics skills than girls (Figure A14, Appendix). The difference in reading skills is most pronounced in Serbia and least in Hungary. In mathematics, there is a negligible gender difference among Polish students, while Hungary has the most substantial one. Such differences between countries show that these differences between girls and boys are not due to inherent cognitive factors but are related to cultural and socialization factors. Moving on to learning pathways, measuring the differences between the education tracks of boys and girls is not straightforward. One common comparison is that of the number of students of both genders attending STEM education (natural sciences, mathematics and statistics, information and communication technologies, engineering, manufacturing and construction). The difference is largest in Hungary (see Figure A15), where in 2018 for each woman there were nearly three men in STEM occupations. The ratio is around 1.5–2 for other countries. Finally, gender-related-attitudes (measured by the European Value Survey, 2017) are useful for assessing the necessity of (a change in) socialization. The composite index presented in Figure 7 shows the proportion of various responses to statements like "the child suffers when women work," "women really want a home and children," "family life suffers when women have a full-time job," "a man's job is to earn money, a woman's job is to look after home and family," "men make better political leaders than women," "university education is more important for boys than girls," and "men make better business executives than women." All countries received a much higher score than the EVS average, which means that these countries are more 'conservative' when it comes to gender roles. Serbia came out as the most 'progressive', while Slovakia proved to be the most 'conservative' on this scale.

In an EDUC working paper, Rédai (2021) looked at the institutional and legal aspect of gender equality in the studied countries and concluded that "Serbia seems to be the most progressive country in terms of gender equality goals" but this is mainly due to the fact that Serbia wants to become an EU Member State, "and one of the conditions for accession is the improvement of gender equality in the country". The other four states had similar preconditions for EU accession, "but after joining the EU, and after conservative governments came to power, this progress slowed down, stopped, or even reversed". This implies that the challenge of gender differences and changing gender goals could become more severe in Serbia after (if) they join the European Union.

Figure 7 ▲ Agreement with conservative gender-related statements in the European Value Study (2017)



Source: data from the European Values Survey (2017), calculation by Horn (2020).

Note: A higher number means more "conservative." The indicator is constructed as the country average of the first principal componant factor of the seven variables (i.e. the linear combination of the seven variables that has maximum variance among all linear combinations. It accounts for as much variation in the data as possible.)

Table 5 ▲ Relative weight of social challenges for each country

Challenge aspect/measure	Hungary	Poland	Romania	Serbia	Slovakia
Decline in student population					
Ability of schools to compensate for socioeconomic disadvantages					
Compulsory schooling, early education, and dropout rates					
Gender attitudes and study perspectives					
Differences in the skills of boys and girls					

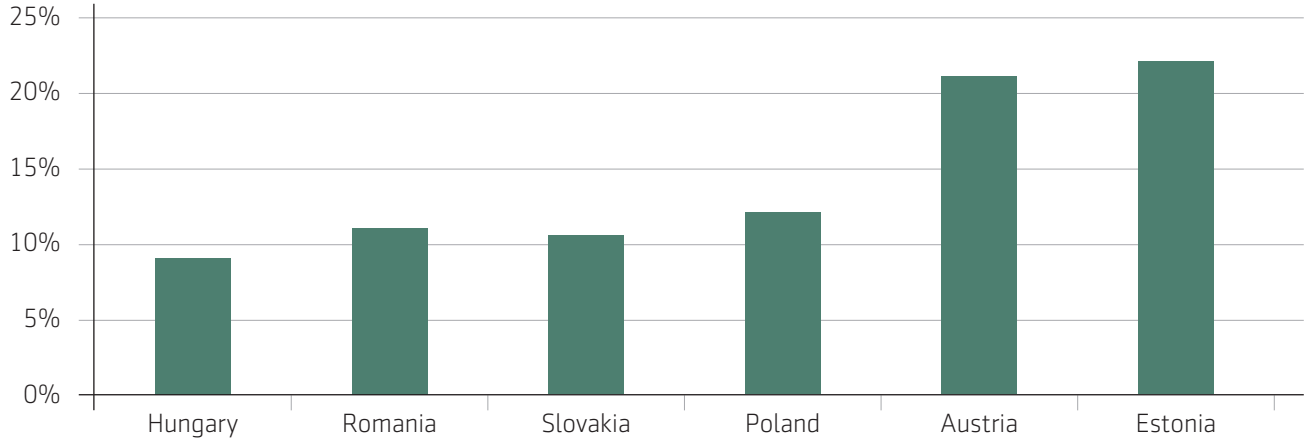
The colors indicate very severe challenges, severe challenges, and moderate challenges considering how prepared countries' education systems are, and how severe the challenge is expected to be for them. See details in the preceding paragraphs.

2.4 Climate change

The last challenge considered in Radó's (2020) paper is climate change. The climate-related attitudes of all, but especially the younger generations, will be crucial determinants of the social changes necessary for mitigation and adaptation. A more climate-change-aware society has a better chance to prepare for the consequences and is more likely to commit to the changes necessary to mitigate effects.

According to a 2019–20 climate survey from the European Investment Bank, individuals from countries in East-Central Europe are less likely to deny climate change and are more likely to believe that it is mainly caused by human activity than the EU average (Figures 8 & A17). This could be connected to the fact that people in these countries are more likely to report that they feel the impact of climate change (Figure A16, Appendix). People in Hungary and Poland are also somewhat pessimistic, as they are more likely to believe that climate change is irreversible, while Slovakians are more likely to believe that it is still reversible. Overall, the data suggest that climate-change-related attitudes pose only a minor-moderate challenge to schools in the region.

Figure 8 ▲ Ratio of respondents who do NOT believe that humans and human activity are the main cause of climate change (EIB, 2019/2020)



Source: https://www.eib.org/en/publications/the-eib-climate-survey-2020-2021.htm

SECTION 3.

Directions for Education Policy and Teaching Practices

This section outlines some desirable policy directions for overcoming the eight future challenges of education in CEE countries. The proposed directions are divided along two dimensions: the challenges they are meant to address, and the actors in the education system who are affected by them. The latter dimension contains two levels: the governing level, and the school level. The governing level refers to policy makers, school owners, employees of ministries, school district bureaucrats, and other people who set the educational agenda either on an international, a national, or a municipal level. The school level refers to the school's management and staff (including but not limited to teachers). These directions are mainly derived from the policy guidelines of the OECD and other international institutions: to save space, the underlying empirical and theoretical grounds are not presented here, but the sources are included in the bibliography.

3.1 General recommendations

3.1.1 Data availability and monitoring

There are three main recommendations concerning data and education that are advocated by international organizations that are highly relevant for CEE countries. These can be regarded as three pillars of effective monitoring and policy evaluations.

First, all countries in the region are advised to participate in every relevant international assessment that generates publicly available data. These assessments provide a good basis for international comparison and help researchers contextualize the problems and reforms associated with education systems by comparing them to those of more and less successful countries. Those referred to in this study (e.g. PISA and TALIS) are good examples of such assessments.

Second, it is extremely beneficial for education management to use regular, standardized tests for all students within the country. These tests can measure the primary output of the system: the actual competencies of children. In order to measure competency, these tests have to be low stakes (as much as possible): i.e. they should not be graded, and they should not be made available to the public so teachers cannot use the findings to prepare their pupils for the specific types of tasks regularly found in them. Both Poland and Hungary use systems that are somewhat similar to this idea. Hungary's system is especially outstanding, with relatively low-stakes testing in the sixth, eighth, and tenth grade, a variety of background variables, and the option to link this data to other administrative datasets

(anonymously) such as the PES unemployment register or the labor market and firm database of the tax office.

Finally, and this is an issue present in most European countries, there is a severe lack of data about ethnicity. The Open Society Foundations recommends that in order to become better equipped to deal with systematic discrimination, governments should carefully collect data on peoples' ethnic background as long as they maintain the ethical and legal boundaries defined by the EU. These are: anonymity, confidentiality, data collection on a voluntary basis, and restricting the use of data to the purpose for which it was collected. For more information on how to collect ethnic data ethically and other important considerations, read Hermanin (2013).

3.1.2 Teacher education, training, and the integration of novice teachers

Teacher education is one of the greatest barriers to pedagogical change in the region. This subsection will give some general suggestions regarding how to improve teacher education in any country of the region, based on OECD (2019a) and OECD (2019b). These recommendations will be sorted into three categories: potential improvements to teacher education, to teacher training, and to the integration of new, young teachers into the school environment.

Let us start with teacher education. Teacher education should be grounded in the profession from the very beginning. It is important to let teacher trainees observe classes of practicing teachers from the beginning of their education, and to provide them with multiple opportunities to practice teaching in actual classrooms. Visits to diverse classrooms with teachers experienced in 'differentiated instruction' should also be an integral part of the program. Certain cornerstones of modern education should be integrated into the curricula of teacher education programs, such as the use of ICT in class and the issue of classroom diversity. This means that these issues should not be treated simply as separate subjects in the curriculum but rather as an integral part of the pedagogy that should be considered in every class. Basic teacher education should also ensure that every teacher speaks at least one foreign language well—preferably English—as this enables them to improve their teaching techniques based on a wider knowledge of the international community.

The main way to improve teacher training is by involving teachers in every step of the process. They can help with the design of training programs, ensuring that the professional development opportunities that are provided are in line with teachers' needs. They can also become teachers of other teachers, thereby spreading good practices and strengthening the national network of teachers (serving as central nodes in a web, and connecting teachers looking for ways to develop good practices they might consider adopting). On top of classic training programs, governments should facilitate peer learning both within and between schools. This is an area with a great deal of potential: it is clear from TALIS (2013 & 2018) that teachers in the region are not likely to observe each other's classes, or to learn new teaching methods collaboratively on a regular basis. There is also evidence that peer learning can improve students' test scores substantially (Jackson & Bruegmann, 2009). However, teacher training—be this classic classroom training or peer learning—needs time. Teachers' contracts should include paid time that is specifically allocated to self-development. Not incorporating this element into teachers'

salary plans will force teachers to participate in training in their free time and during school breaks: potentially to a lesser extent than is desirable, or maybe even not at all.

Finally, TALIS also tells us that there should be greater emphasis on the proper introduction of novice teachers to the profession. The goal every school should strive for is to establish "a nurturing environment that allows for enough flexibility to try different approaches to teaching and provides enough support to guide novice teachers in their daily tasks" OECD (2019b).[11] Unfortunately, TALIS (2013 & 2018) shows us that schools in the region have a lot to improve in this respect. The OECD (2019b) recommends helping novice teachers enter less challenging working environments for their first placements, while encouraging experienced teachers to work in more disadvantaged schools. They also recommend incentivizing schools leaders to make the transition of recent graduates into the profession smoother through mentoring and introduction activities. Further, they advise lowering the teaching load of new teachers and offering additional support for young teachers with a minority background. These measures could make novice teachers more confident in their profession and lessen the risk of early attrition.

3.2 Adapting to political challenges

There are two situations CEE countries may find themselves in in the first part of the twenty-first century when it comes to populistic policies. There are countries where autocratic-populist parties have seized control (Hungary, Serbia, and Poland), and others where they might become a major political issue in the future (Romania, and Slovakia). Countries in the latter group are arguably in a better position to change as, at least in theory, the leaders of these countries may be convinced to implement comprehensive educational reforms. This subsection primarily focuses on what local, school-level actors can do to ensure quality education for their pupils who are under pressure from these regimes, as well as on the policy directions democratic governments can take to preventively make schools and education system more resilient to bad or destructive governance.

Let us begin with how to make education more resilient. First, the country reports identified a common regional problem: schools in the region are generally underfunded and, more importantly, they lack financial flexibility. This makes schools more susceptible towards political pressure, but is also a source of outright inefficiency. During the COVID-19 crisis, public schools in the region were unable to adapt to online teaching as fast as private schools partially because they lacked the resources to cover the cost of school coordinators who could support teachers by solving technical difficulties and managing schedules. Had governments permitted some flexibility in school budgets (i.e. money that schools can spend either completely freely, or freely but on certain types of things) schools would have had the opportunity to adapt quicker to the new circumstances. Of course, a flexible budget is useful outside times of crisis as well: it allows educators to allocate resources to further training, the implementation of new teaching methods, to modernize classrooms, or any other goal that the given institution finds desirable for pedagogical development.

11. Quote from the connected blog post: https://oecdedutoday.com/talis-support-novice-teachers/

Second, the country reports also highlight the need for more professional autonomy of schools and teachers. This primarily means greater autonomy over what is taught and how students are assessed. Poland is the only country in the region where the government introduced educational reforms centred on increasing professional pedagogical and institutional autonomy. The fact that even though the current, populist government has reversed a lot of these policies, the professional autonomy of schools remains strong and mostly unaffected by politics—especially compared to in Hungary, where similar government efforts have succeeded—shows the lasting impact of these kinds of reforms.

There are some general directions schools and teachers can follow even if they are under pressure from populistic-autocratic regimes. For instance, there are some fundamental skills and knowledge educators can focus on to counter the influence of populistic-autocratic regimes on their pupils. It goes without saying that classroom activities should nudge students to develop a high level of critical thinking, defined by McPeck (1981) as the propensity and skill to engage in an activity with reflective scepticism. These activities could include in-class brainstorming, organized debates, critical content analysis of text or media, opinion essays, and so on. It is a good idea to mix these exercises with ones that improve fact-checking skills and information fluency, so students learn to use the internet for their own benefit without being misled by scam sites or fake news. Furthermore, teachers should seize every opportunity to increase students' knowledge and awareness of the media and economic or social issues. These topics are typically under-taught in the region—even though basic knowledge in these subject areas is fundamental for understanding simple policy discussions.

If students can experience and practice democracy in school, they will understand democratic processes and might be more likely to protect democratic institutions. They will also notice when these institutions are threatened or under pressure. Student organizations can serve as democratic playgrounds if students feel that through these institutions they have an actual impact on student life at their schools. For example, student parliaments that include representatives of all classes could have the right to suggest changes to school policies or to form committees about student matters and negotiate with principals about these issues. Vitally, teaching staff must take these suggestions and negotiations seriously, as these processes are part of the democratic education of children, and thus count as one of their pedagogical obligations.

3.3 Adapting to economic and social challenges

While economic and social challenges to education are fairly easy to tell apart, it is not so straightforward to split potential responses to these challenges into two groups. Policies that make education more accessible and equitable also create pathways of mobility for talented children, and for pupils who master the ability to learn. The policy directions outlined in this subsection all contribute to three major goals at the same time:

1. Reducing dropout rates and other forms of failure of the education system.
2. Making education more equitable and hence society fairer.
3. Reducing the large societal cost of having adults with inadequate skills.

There are eight areas of improvement highlighted in this subsection: basic skills, language learning, ICT use, soft skills, vocational education and tracking, supporting families and teachers of low-SES students, intercultural education, and gender equality. Let us consider them in this order.

3.3.1 Teach basic skills

This policy direction is probably the most straightforward: all courses in the curriculum should in one way or the other improve the literacy and numeracy skills of pupils. Naturally, mathematics and native language and literature classes play a bigger role in learning these competencies, so students should encounter the need for these skills and knowledge in a lot of different settings so they learn how to apply them under new and different circumstances.

3.3.2 Facilitate language learning

Language has very high "enabling-power" in today's labor market in CEE countries. It enables workers to apply to positions at firms that offer higher salaries (usually owned by foreign investors and selling goods or services abroad). It opens up a whole new avenue of training and self-improvement classes both online and in the form of international education programs or work exchange programs. It is also a crucial basic skill for those who want to start a business: foreign language skills can open channels to new suppliers or customers. They also lower the barrier to better financial literacy (as most material on financial education is in English) and help people make better investments (by enabling them to read news from other countries directly). Also, being able to use a lesser-known language is also a great asset in the labor market that could lead to unique job opportunities. The list of arguments for the importance of language skills could go on forever.

At the very least, governments should set the goal of ensuring every capable child attains at least a B2 level of proficiency in one language by the time they become 16. A more ambitious but also more beneficial goal would be for pupils to reach a C1 level before they become adults. Besides direct language education, student exchange programs, international summer schools, and distance (online) language learning partnerships are also great ways to motivate students and increase their language proficiency at the same time.

3.3.3 Promote the use of ICT skills in education

At the school level, there is an urgent need to increase the digital preparedness of teaching staff. School management must incentivize teachers' (self-)development and provide or suggest opportunities to acquire new digital teaching methods. It is vital to make sure that teachers have access to functioning and sufficiently modern equipment (laptops, smart boards, etc.), and support staff. Most importantly, as the heads of teaching staff, school directors and managers can and should promote a working environment in which teachers are encouraged and given the flexibility to experiment with these new technologies. New teaching methods using ICT software and skills should be welcomed (e.g. flipping

the classroom, where watching the lectures in video format is the homework, and classroom time is reserved for discussion and interactive tasks), but should also be examined closely to determine the extent to which they are suitable for the school's social environment.

Obviously, these changes are only possible with state support. Education management should provide the necessary finances and financial flexibility, while it can also provide platforms for spreading good practices (for the use of digital technologies in class). For further information on what governance-level actors can do to improve ICT skill learning, see the subsection on teacher training.

3.3.4 Cover soft skills and skills of adaptation

The shift away from routine, "algorithmic" tasks at work pushes workers to focus on more abstract tasks that often require good interpersonal competence. For this reason, it is the duty of schools to prepare students for collaborative work that often also requires constant self-improvement. This means that schools and educators should focus on helping students acquire high levels of personal and social skills and learning-to-learn competences. That is, "the ability to reflect upon oneself, effectively manage time and information, work with others in a constructive way, remain resilient, manage one's own learning and career [...] cope with uncertainty and complexity, learn to learn, support one's physical and emotional well-being, empathize, and manage conflict" (European Council, 2018, p. 10). For further details on the concept and effective teaching of this key competence area, see Caena & Punie (2019) and Letina (2020).

3.3.5 Reform vocational education, extend comprehensive schooling, and delay tracking

Csillag (2015) recommends that countries in the region should look to the reforms in Poland (1997-2001 & 2007–2011) as a source of inspiration. Some of these reforms have been reversed in the past six years, but this was despite the overwhelming consensus of experts that these reforms were successful.

The Polish reforms extended comprehensive schooling (and delayed the tracking procedure) through "policies that prevent the concentration of low socio-economic background students in some schools, e.g. establishing larger schools, or [cautiously] limiting free school choice" (Csillag, 2015). The OECD (2015) recommends these kinds of reforms and suggests limiting early tracking and the postponement of academic selection.

Csillag (2015) also highlights the integration of basic vocational education into vocational secondary education that enables all students to conclude their studies with a secondary-school-leaving certificate (matura / baccalaureate / final exam) as a reason why the reforms in Poland worked so well. This also ensures that vocational students also receive the necessary education in basic skills and languages alongside (and incorporated into) technical subjects. This is also in line with the recommendation of the OECD that higher-level vocational education and pathways to tertiary qualifications should be promoted, but also highlights that these policies should be accompanied by efforts to minimize dropout.

Another desirable reform direction would be to open pathways between tracks, enabling students from a vocational background to enter university if they want to. This can be facilitated by several policies: ensuring compatibility between educational structures, retention policies, fiscal or educational study aid, etc.

A state-of-the-art vocational education program should also provide students with managerial, entrepreneurial, and teaching skills so they can improve their businesses, themselves, and their (novice) colleagues in the future. These skills can also come in handy if the government decides to promote German-style apprenticeship programs or other work-based learning programs in which schools and industry partners work together, and the government provides quality assurance systems.

The OECD also recommends working with stakeholders from the labor market to design a measurement framework for the output of vocational programs. The current practices—not just in the region but in the whole of Europe—are either of low quality and not sufficient for output monitoring, or are (in most cases) non-existent.

A final thing to point out is that a responsible government should be aware of the present-biased thinking of labor market stakeholders. Leaders or representatives of firms and companies sometimes tend to overstate their short-term needs and propose lessening the emphasis on non-vocational courses and skills (literacy, numeracy, ICT, and language) in the curriculum. These propositions should be handled with caution and the voice of pedagogical experts and social science advisors should also be considered.

3.3.6 Support families and teachers of low-SES students

The main ways to help teachers of low-SES students are addressed in the subsection of policy directions related to teacher training, above. One aspect that has not been covered yet is school financing. There are multiple financing strategies governments can choose to compensate for the disadvantages of low-SES students. One example would be allocating school budgets from a central source on the NUTS-4 level based on a formula that considers—for example—regional development and the number of students per teacher. The important thing is that budgets should incentivize and help the education of low-SES students, and direct resources to the teachers of students with the greatest needs.

The rest of the policy directions detailed in this subsection are borrowed from the OECD's "Ten Steps to Equity in Education" policy brief from 2008:

1. Offer second chances to benefit from education.
2. Identify and provide systematic help to those who fall behind at school and reduce year repetition.
3. Strengthen the links between school and home to help disadvantaged parents help their children to learn.
4. Set concrete targets for more equity, particularly related to low school attainment and dropouts.

3.3.7 Educate children about dissimilarity

The policy changes mentioned in the previous two subsections would undoubtedly benefit Roma and other children of ethnic background as well, but there are further policies that could alleviate their situation and open up paths for social integration and mobility. These policies often require educators to rethink how they approach education: the now-traditional nationalistic view of history, literature, and general world view can and should be replaced by inclusive but locally still relevant alternatives. These could range from outright intercultural education to simply taking the time to educate children about dissimilarity. For instance, national education in CEE countries does not leave space for studying the historical perspective and literature of neighbouring nations (with shared histories) and the minorities within these countries. Major national events such as the revolutions of 1848 or democratic rebellions during the Soviet era could be presented from a cross-national, multi-ethnic point of view, wherein students learn about the perspectives of different national and ethnic groups involved in these events.

Meanwhile, ethnic/national subjects in school (such as Roma languages, history, literature, etc.) could be presented as an option (at the very least until and including the first stage of basic education, but preferably further) to both children from both Roma and non-Roma families. These changes, in the right environments, would make education more children-focused and allow Roma students to feel included in their own education, in turn making them motivated to learn and think more about their place in the world. For a detailed overview of the preparedness of the education systems of CEE countries to provide inclusive education for Roma pupils, see Kende (2020b).

3.3.8 Mitigate gender-related inequalities

There are a couple of practices teachers and schools can apply to mitigate gender-related inequities. First, educators need to be reflective about how they evaluate their students: it is important to measure "achievement" on the same scale for the members of both sexes—there is evidence of gender bias in teachers' individual evaluations of boys and girls (Lavy & Sand, 2018; Jones & Myhill, 2004), whereas standardized testing is argued to play a role in reducing gender-based performance differences (Hadjar & Buchmann 2016). Teachers and schools should support pupils to pick learning pathways based on their abilities, not on their gender (e.g. STEM subjects). Second, gender segregation is more prominent in education systems with early tracking and vocational orientation (Smyth, 2005), which provides yet another argument for delayed specialization. Finally, schools should allocate time for discussing topics like the history and status of gender differences and discrimination, gender diversity, and concepts such as social justice, equity, and inequality. However, this should be the responsibility of teachers who have been trained to discuss sensitive topics such as these: initial teacher training for pre-service teachers at universities should include gender-related topics in pedagogical and psychological areas, and further in-service training should later be offered on the same topics.

3.3.9 Inform and involve parents

In theory, parents may be important stakeholders in school reforms: they may put pressure on schools to improve performance or adjust their goals using formal or informal channels, acting via established parent organizations or individually (OECD, 2013b). In reality, the role of parents tends to be limited in CEE countries, partly due to institutional frameworks that allow little room for parent involvement and partly due to the inherited attitudes of both teachers and parents that frame their relationship in terms of authority and responsibilities rather than the mutual cooperation of equal partners. At the same time,, in a political context where there is little external pressure for school reform, parents have some potential to push for improvements—however, this depends on their understanding of what sort of change is needed, and also on the financial and other costs of securing good education for a select few within or outside the public education system. Reform-minded policy makers, professional organizations for teachers (or external donors), and NGOs that promote equal opportunities should work towards empowering parents. In fact, informing parents about the new ideals of teaching methods and content is useful even when there is sufficient political will for reform, so that parents understand the need for change, and are not used by opponents who push for their reversal.

3.4 Climate change

The approaching climate disaster will undoubtedly have a serious impact on the lives of today's children. Therefore, it is important to raise awareness among students, "to help [them] understand the science of climate change and its social consequences, and to prepare them to cope with its impact" (Radó, 2020). It is also vital to give them the ability to assess the validity of information that is available on the subject (i.e. to tell fake science from real science). Pupils should learn the primary ways to reduce the climate footprint of individuals and societies, and connect to the topic by changing their own and their families' habits into more climate-friendly routines.

SECTION 4.

Recommendations for Further Research

This section outlines eight areas where further academic research on existing CEE education systems would be especially useful in relation to future challenges. These are areas where well-designed policies have significant potential to steer education systems towards better performance, but the scarcity of empirical evidence seriously constrains the design of such policies. To identify these areas, the authors of this paper drew on previous sections and informal discussions with Márton Csillag, Dániel Horn, and Balázs Váradi, as well as comments from Péter Radó and Dorottya Rédai.

4.1 Teacher's labor market

Teachers are arguably the most important actors in the education process. However—at least in CEE countries—there is a severe lack of research (and available micro-level data) about teachers' compensation, teacher-student ratios, and teacher supply and demand. Research that reveals regional and between-school patterns associated with the labor market for teachers would help with formulating well-targeted teacher-centric education policies.

4.2 School effectiveness and learning environments

This research area concerns the potential of school autonomy as a policy lever. Can effective school leadership improve the learning environment, and ultimately learning outcomes, in schools where most teachers are unmotivated and/or poorly trained? If so, what are the good practices of such leaders that could be disseminated to other schools?

4.3 Vocational education: effectiveness and lobbying

There is no standard measurement of vocational learning outcomes. To establish such measurements, researchers should propose a framework for identifying what makes vocational education effective. Another way researchers can facilitate the formation of these assessments is through an analysis of the extent/types and reasons for the apparent bias of labor market actors. The latter analysis can aid decision makers in their attempts to cooperate with representatives of firms concerning the establishment of these tests, and to understand where they come from, through having the necessary background knowledge.

4.4 Solutions for quality assurance applicable in CEE countries

The present operational solutions for quality assurance in public education were typically developed within a favourable institutional setup—in mature democracies with an efficient governance structure. In the CEE context, these solutions may not work effectively, while some second-best solutions may prove more effective. There is need for more research on how the institutional context (broadly defined as covering stakeholder attitudes and social norms as well as financing, autonomy, and regulation) may limit the functioning of quality assurance tools and mechanisms in CEE and how these limitations may be overcome or circumvented by adjusting the assurance system. One line of investigation may be the interplay of municipal systems and the inherited governance structure of public education: the political costs (and their deterring effect) of limiting school autonomy may vary significantly depending on this initial setup. Cross-country analysis of the outcome of attempts to increase or curb school autonomy may also shed some light on the role of the institutional context.

4.5 CEE best practices for mitigating the effects of segregation

There are a variety of small but successful initiatives throughout CEE countries that try to tackle the issue of segregated schools. These include schools or networks of schools owned by independent foundations, religious institutions, or sometimes even the government. However, as yet there has been no attempt to summarize the experience and practices of these schools in a way that makes their knowledge accessible to educators and policy makers in other countries. In an education system that is well-adapted to the challenges discussed in this working paper series, segregated schools would be replaced by (or dissolved into) mixed-ability schools with mixed-ability classes. Nevertheless, knowledge of these initiatives could be useful from at least two perspectives. First, knowing which practices may be scaled up from the school level and adopted by the national education system (i.e., are there any teaching methods, financial allocation mechanisms, class compositions, etc. that could be implemented in every school—as mixed ability schools will face similar challenges to segregated schools but to a much smaller extent)? Second, are there examples of segregated schools with a motivated teaching staff and innovative teaching practices with high value added—i.e. if abolishing segregation is not an option in the short run, are there any second-best alternatives?

4.6 Subliminal messages in teaching materials and their role in reinforcing or changing social norms

Many of the new challenges can only be tackled if new generations are able to change pre-existing social norms and attitudes—for example, about climate change, gender roles, or tolerance for ethnic and other minorities. Textbooks are a vehicle for transferring social norms, but this role may pass unnoticed unless systematically wired into the professional review process. As a result, textbooks may unknowingly reinforce outdated norms even if this runs counter to the intention of educational authorities. Although there is a growing body of research on textbook content in CEE, it tends to

focus on outcomes (i.e. the norms reflected in particular texts), rather than the institutional process that generates them. The latter is needed for developing viable policies for making systematic and profound changes in teaching materials.

4.7 Democratic education and the cost of no change

Teaching in CEE countries is often perceived as teacher-centric (as opposed to student-centric). It is characterized by frontal teaching, weak student participation in class, rigid course structure, and a lack of self-governing student bodies. In practice, teacher-centric education can also amplify the effects of teachers' innate biases and (latent) bigotry. These characteristics make today's schools in CEE countries fundamentally undemocratic. More democratic schools would encourage student participation at all levels of the education process, maintain self-governing (and democratic) student organizations, allow students to contribute to discussions about school-level decisions, and strive to ensure equal opportunities for all pupils regardless of their gender or ethnicity (both in class and regarding every other school-related matter).

One could argue that school democratization represents value on its own, as it helps students learn how to practice democracy and helps them become better citizens. Nevertheless, it would be interesting and policy-relevant to conduct research on the cost of undemocratic schools (as opposed to more democratic ones). Some areas of research where the two types of schools could be compared are: basic skills, soft skills and the learning-to-learn competence, the socialization processes, school-related gender and ethnicity-based violence, ethnic and gendered classroom management practices, and the effectiveness of school management and leadership. By looking at these aspects of both school types and the expected costs of switching to more democratic policies from currently undemocratic ones, researchers could identify the most efficient policies that should be implemented first in order to make CEE schools more efficient, equitable, and democratic.

4.8 Content-sharing practices

Online platforms have great potential for reducing the cost of accessing teaching materials and generating ideas for individual teachers, especially in resource-stricken education systems. Such platforms may be used by central education agencies or professional associations to share centrally developed materials, and may also support horizontal cooperation and sharing between teachers. The COVID-19 pandemic has given a boost to such initiatives, but there is yet little systematic research on the role of such platforms in improving teaching quality and possibly in magnifying inequalities. Research should explore who uses these platforms and who does not (and why), what the quality of materials that are shared is, how intensively these shared materials are actually used in the classroom, and how schools, agencies, and formal or informal professional groups may facilitate (or hinder) their use.

References

Caena, F., & Punie, Y. (2019). Developing a European Framework for the Personal, Social & Learning to Learn Key Competence (LifEComp). *Literature Review & Analysis of Frameworks*. EUR, 29855.

Ciolan, L., Stîngu, M., & Iftimescu, S. (2021). The institutional conditions of adapting to future challenges in the Romanian education system. Working Paper. CEU Center for Policy Studies.

Csillag, M. (2015). *Early tracking and Equity in Education in the Visegrad countries*. Policy Brief. Budapest Institute for Policy Analysis. Available at: http://www.budapestinstitute.eu/uploads/BI_policy_brief_2015.1.pdf

Echazarra, A., & Radinger, T. (2019). *Learning in rural schools: Insights from PISA, TALIS and the literature*. OECD Education Working Paper No. 196.

European Council (2018). Council Recommendation of 22 May 2018 on key competences for lifelong learning. *Official Journal of the European Union*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018H0604(01)&from=EN

Gawlicz, Katarzyna & Starnawski, Marcin (2018). Educational policies in Central and Eastern Europe: legacies of state socialism, modernization aspirations and challenges of semi-peripheral contexts, Policy Futures in Education 2018, Vol. 16(4) 385–397. Available at: https://journals.sagepub.com/doi/pdf/10.1177/1478210318777415

Hadjar, A. & Buchmann, C. (2016). *Education systems and gender inequalities in educational attainment*. In book: Education Systems and Inequalities.

Hermanin, C. & De Kroon, E. (2013). *The Race Equality Directive: a Shadow Report*. Open Society Foundations.

Horn, D. (2020). Comparative statistical analysis of the indicators related to future challenges to education in the CEE countries. To be published.

Jackson, C.K. & Bruegmann, E. (2009). Teaching students and teaching each other: The importance of peer learning for teachers. American Economic Journal: *Applied Economics*, 1:4. 85–108.

Jakubowski, M. (2021). *The institutional conditions of adapting to future challenges in the Polish education system*. Working Paper. CEU Center for Policy Studies.

Jones, S. & Myhill, D. (2004). Seeing things differently: teachers' constructions of underachievement. *Gender and Education*, 16:4. 531–546.

Jovanović, P. (2021). *The institutional conditions of adapting to future challenges in the Serbian education system*. Working Paper. CEU Center for Policy Studies.

Kaščák, O. (2021). *The institutional conditions of adapting to future challenges in the Slovak education system*. Working Paper. CEU Center for Policy Studies.

Kende, Á. (2020a). *The preconditions of institutional change in schools*. Working Paper. CEU Center for Policy Studies.

Kende, Á. (2020b). *Comparative overview of the capacity of the education systems of the CEE countries to provide inclusive education for Roma pupils*. Working Paper. CEU Center for Policy Studies.

Lavy, V. & Sand, E. (2018). On the origins of gender gaps in human capital: Short-and long-term consequences of teachers' biases. *Journal of Public Economics*, 167, 263–279.

Letina, A. (2020). Development of Students' Learning to Learn Competence in Primary Science. *Education Sciences*, 10(11), 325

McPeck, J.E. (2016). *Critical thinking and education*. Routledge.

Mincu, M.E. (2016). Communist education as modernisation strategy? The swings of the globalisation pendulum in Eastern Europe (1947–1989). *History of Education*, 45:3. 319–334. DOI: 10.1080/0046760X.2015.1127432

OECD (2008). Ten Steps to Equity in Education. Policy Brief. Available at: https://www.oecd.org/education/school/39989494.pdf

OECD (2013a). What makes urban schools different?. *PISA in Focus*.

OECD (2013b). *PISA 2012 Results: What Makes Schools Successful (Volume IV). Resources, Policies and Practices* https://read.oecd-ilibrary.org/education/pisa-2012-results-what-makes-a-school-successful-volume-iv_9789264201156-en#page145

OECD (2015). OECD Reviews of Vocational Education and Training. Key Messages and Summaries. Available at: https://www.oecd.org/education/skills-beyond-school/OECD_VET_Key_Messages_and_Country_Summaries_2015.pdf

OECD (2019a). *A Flying Start: Improving Initial Teacher Preparation Systems*, OECD Publishing. Paris. https://doi.org/10.1787/cf74e549-en

OECD (2019b). Supporting and guiding novice teachers: Evidence from TALIS 2018. *Teaching in Focus*, No. 29. OECD Publishing. Paris. https://doi.org/10.1787/fe6c9c0c-en

Pomerantsev, P. (2019). *This is Not Propaganda*. Adventures in the War Against Reality. Faber&Faber, 2019.

Smyth, E. (2005). Gender differentiation and early labour market integration across Europe. *European Societies*, 7:3. 451–479.

Radó, P. (2020). *The Adaptability of Education Systems to Future Challenges in Context: An Analytical Framework*. Working Paper. CEU Center for Policy Studies.

Radó, P. (2020). *The Institutional Conditions of Adapting to Future Challenges in the Hungarian Education System*. Working Paper. CEU Center for Policy Studies.

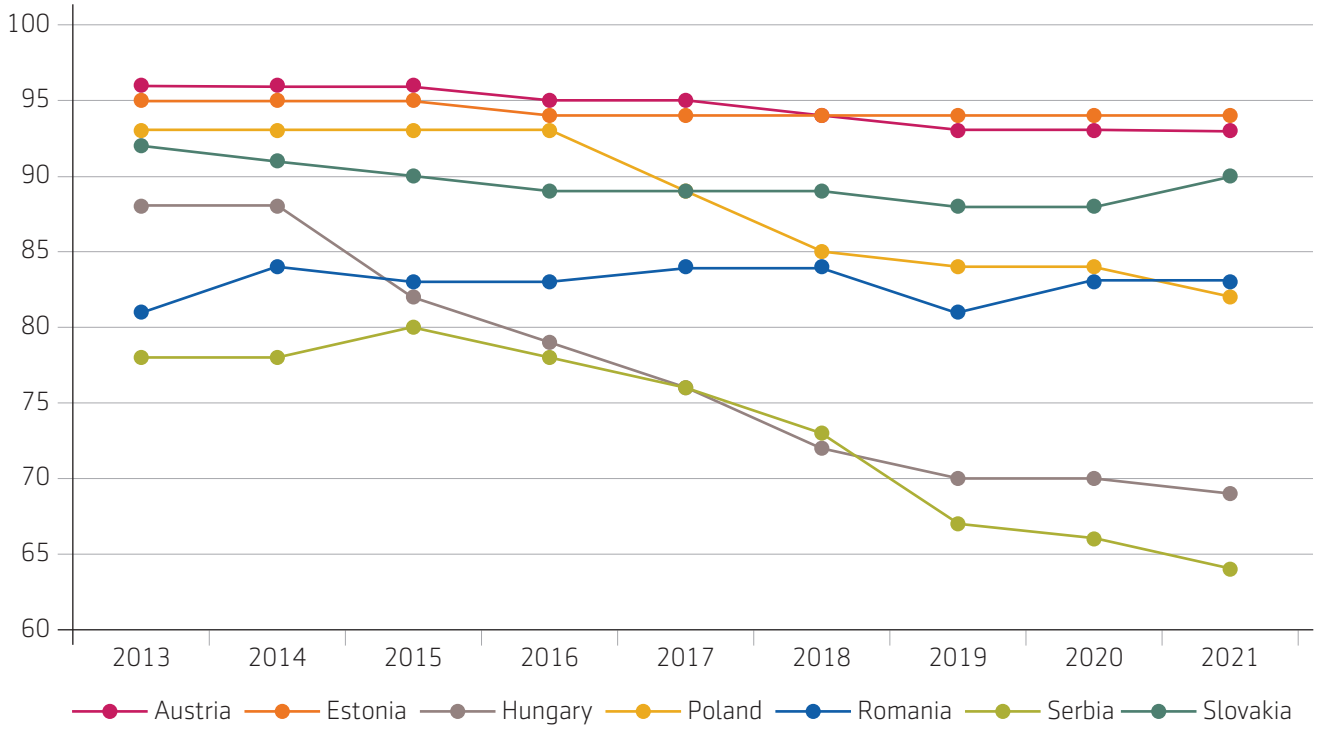
Rédai, D. (2021). *Comparative Overview of the Capacity of the Education Systems of Five Central Eastern European Countries to Adapt to Changing Gender Roles*. Working Paper. CEU Center for Policy Studies.

Szikra, D. (2010). Eastern European faces of familialism: Hungarian and Polish family policies from a historical perspective." In Diana Auth, Eva Buchholz, Stefanie Janczyk (eds.): *Selektive Emanzipation: Analyse zur Gleichstellungs- und Familienpolitik.* [Politik und Geschlecht, Band 21] Verlag Barbara Budrich, Opladen & Farmington Hills, MI, 2010. 239–254.

Appendix

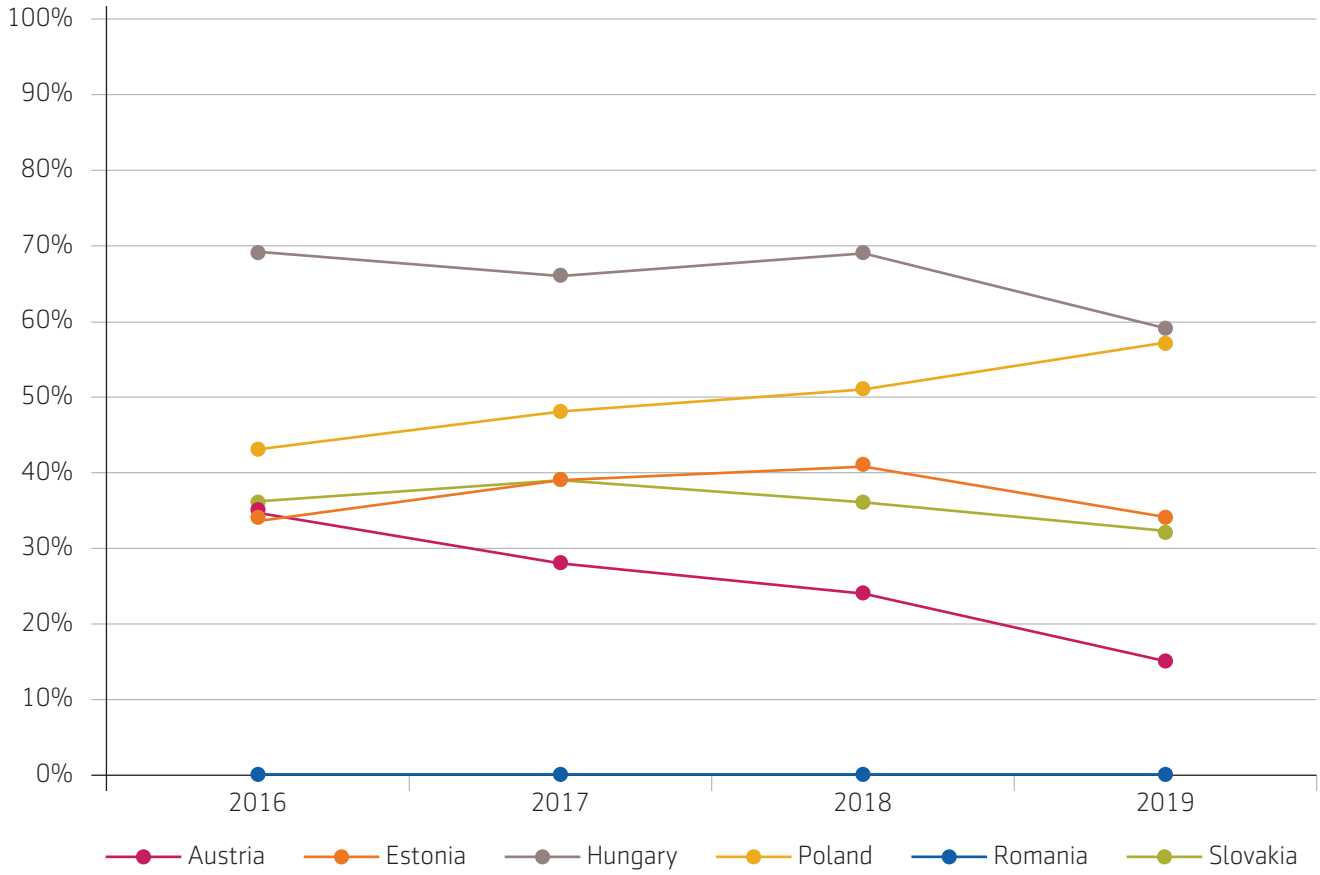
Figures

Figure A1 ▲ Freedom House Index



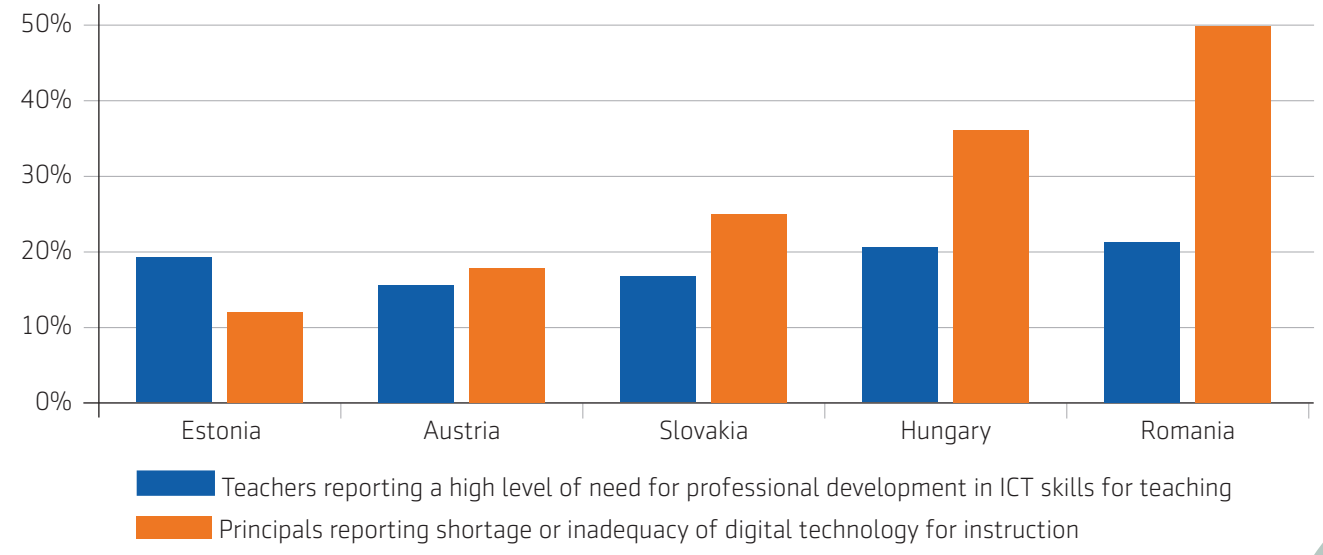
Source: https://freedomhouse.org/countries/freedom-world/scores

Figure A2 ▲ Predicted share of vote for populist parties (Populism Tracker, %)



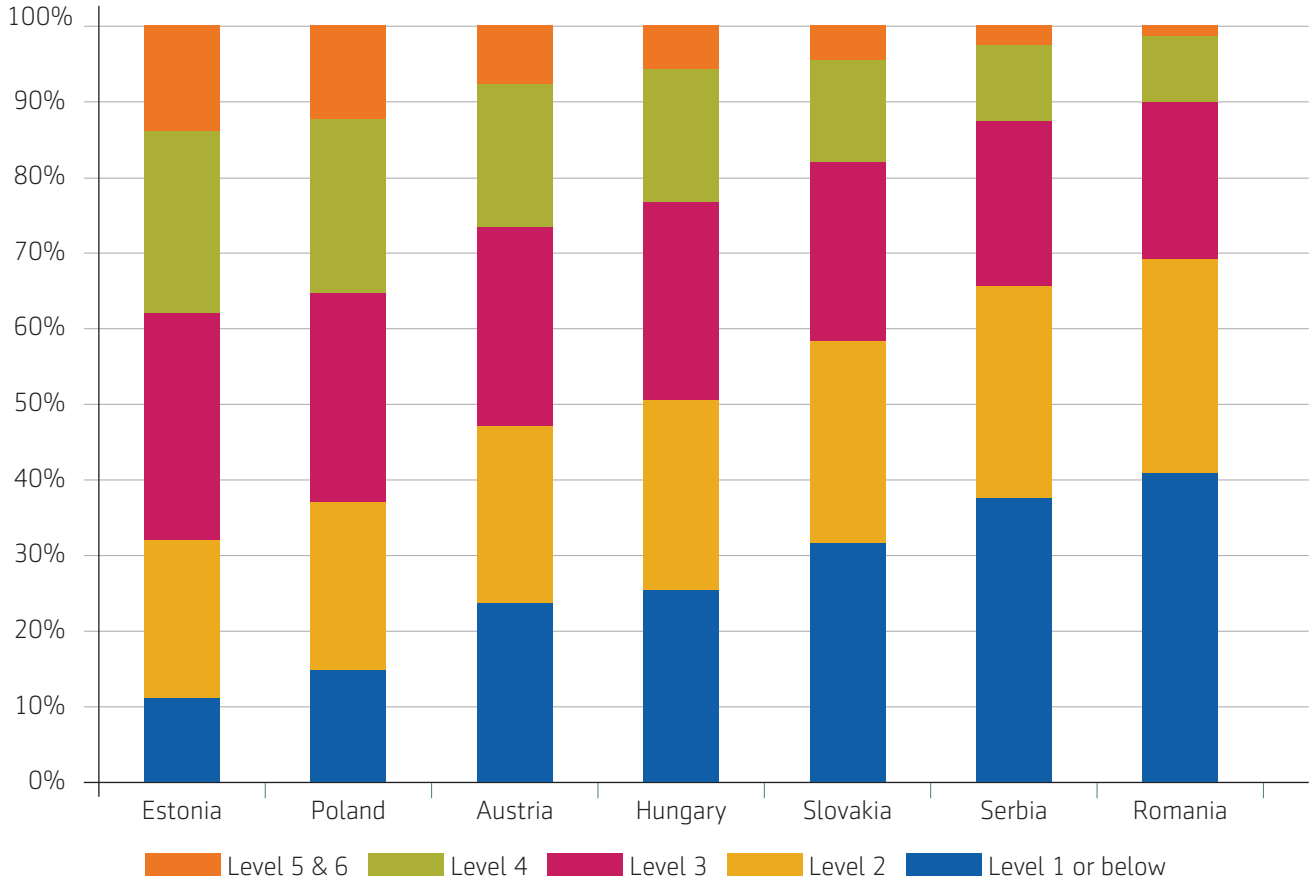
Source: https://progressivepost.eu/spotlights/populism-tracker

Figure A3 ▲ ICT preparedness of schools, TALIS 2018



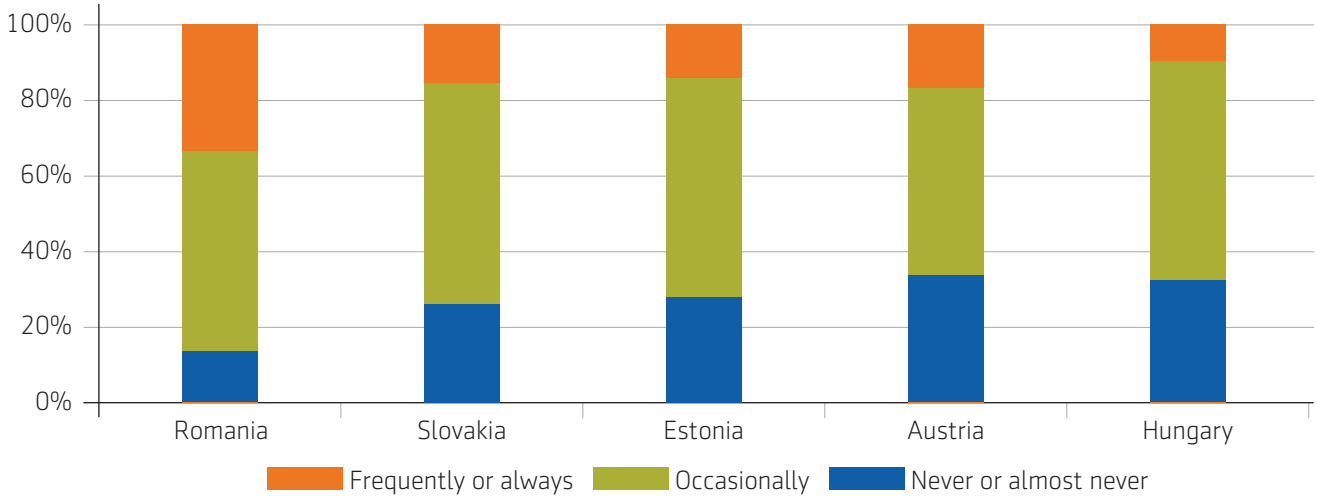
Source: Teaching and Learning International Survey (2018)

Figure A4 ▲ Results from PISA 2018: Reading



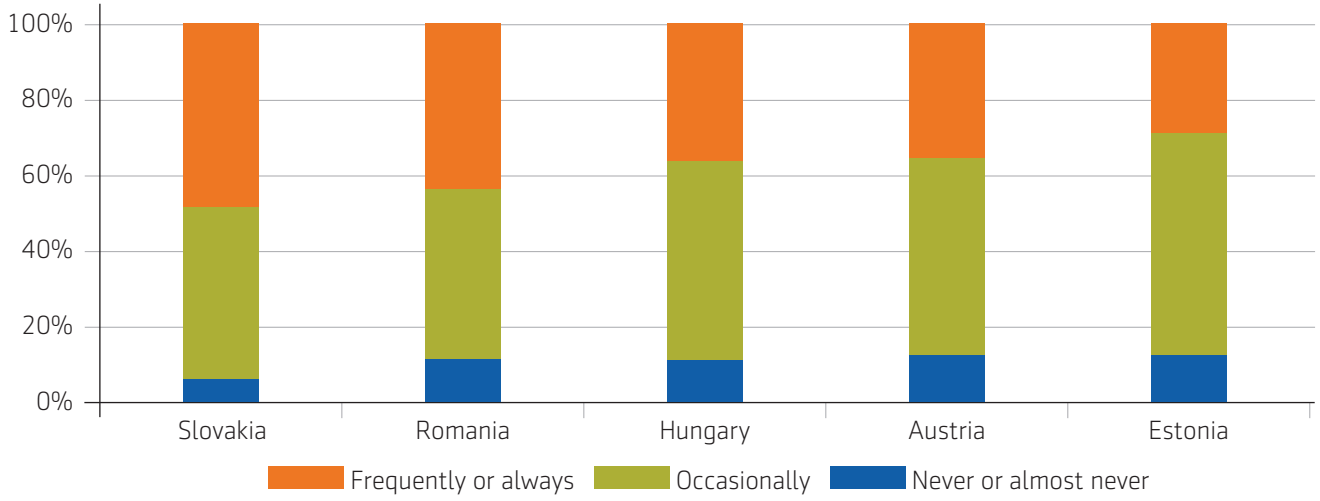
Source: Program for International Student Assessment (2018)

Figure A5 ▲ Projects that require at least one week to complete



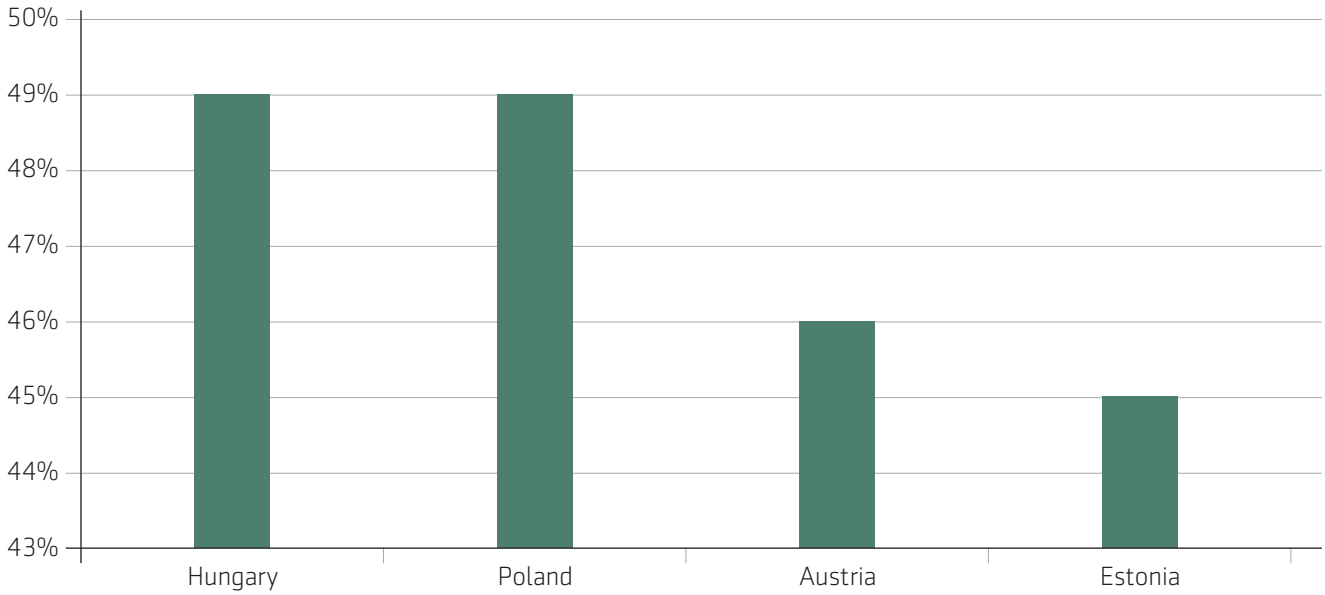
Source: Teaching and Learning International Survey (2018)

Figure A6 ▲ Students decide on own procedures for solving complex tasks



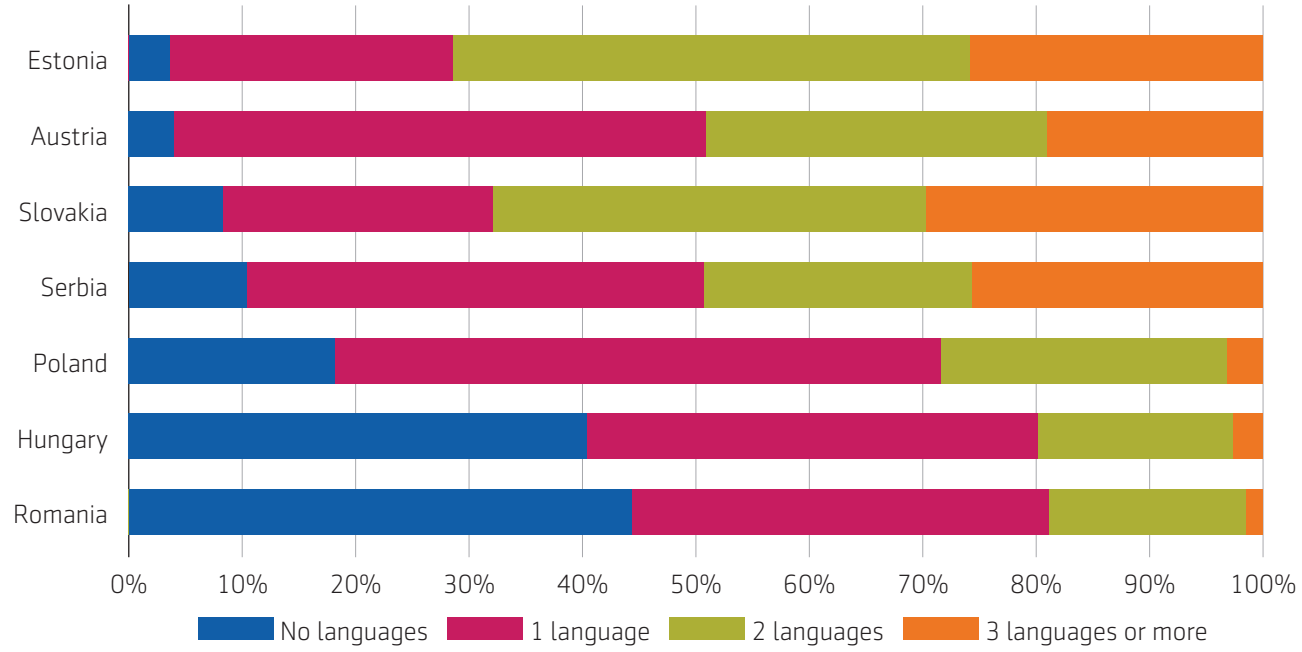
Source: Teaching and Learning International Survey (2018)

Figure A7 ▲ Aggregated technical automation potential of countries, % of working hours (2016)



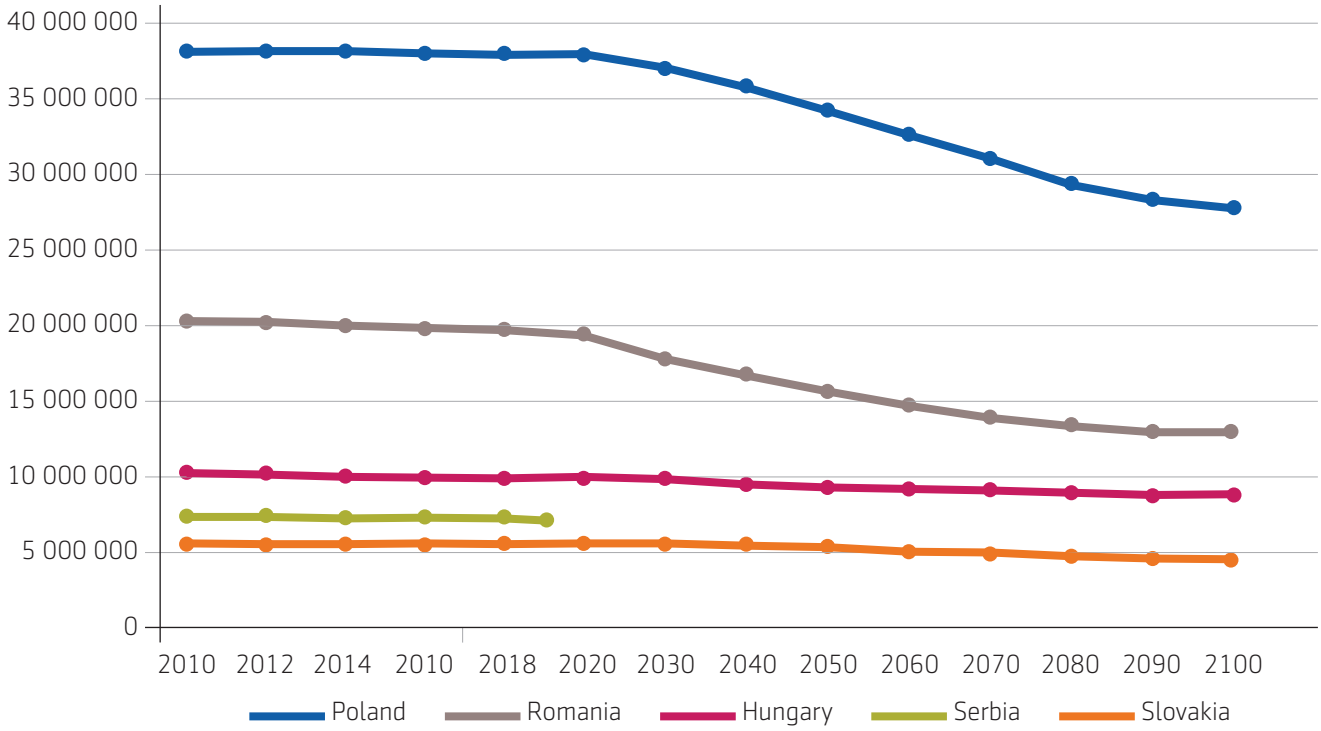
Source: https://www.mckinsey.com/~/media/McKinsey/Locations/Europe%20and%20Middle%20East/Hungary/Our%20Insights/Transforming%20our%20jobs%20automation%20in%20Hungary/Automation-report-on-Hungary-EN-May24.ashx

Figure A8 ▲ Number of foreign languages known (self-reported) among 25 to 34-year-olds, 2016



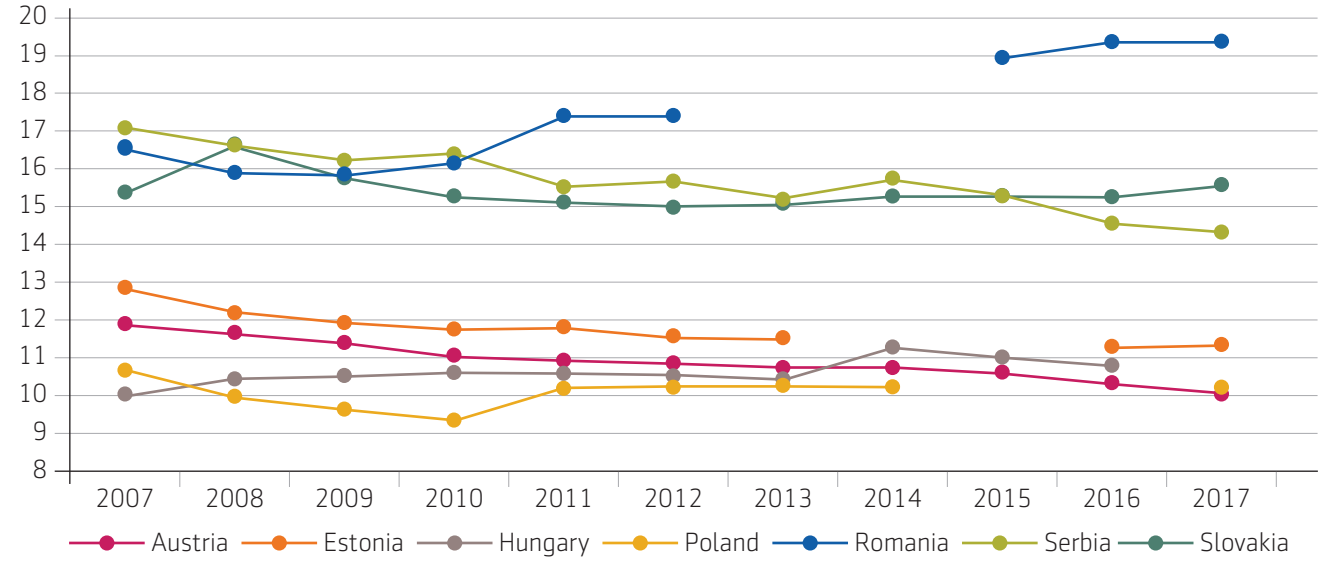
Source: Adult Education Survey (2016)

Figure A9 ▲ Population of countries—prediction



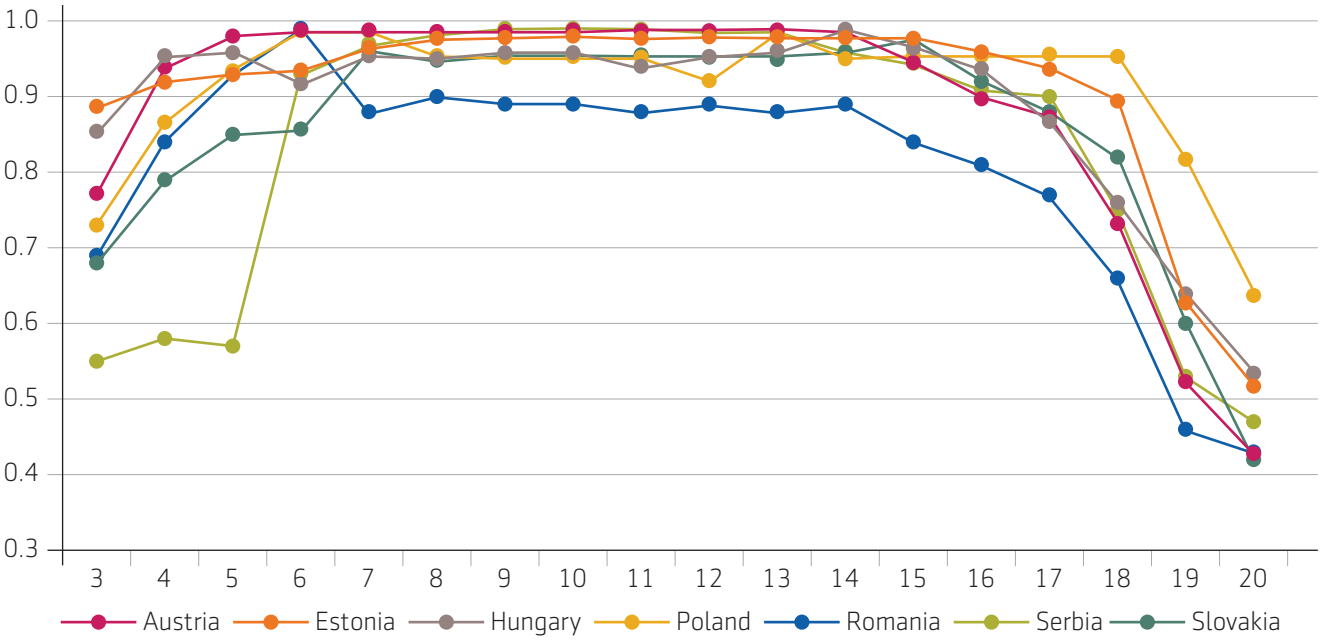
Source: Eurostat, https://ec.europa.eu/eurostat/databrowser/view/tps00002/default/table?lang=en

Figure A10 ▲ Pupil-reacher ratio in primary education (World Bank)



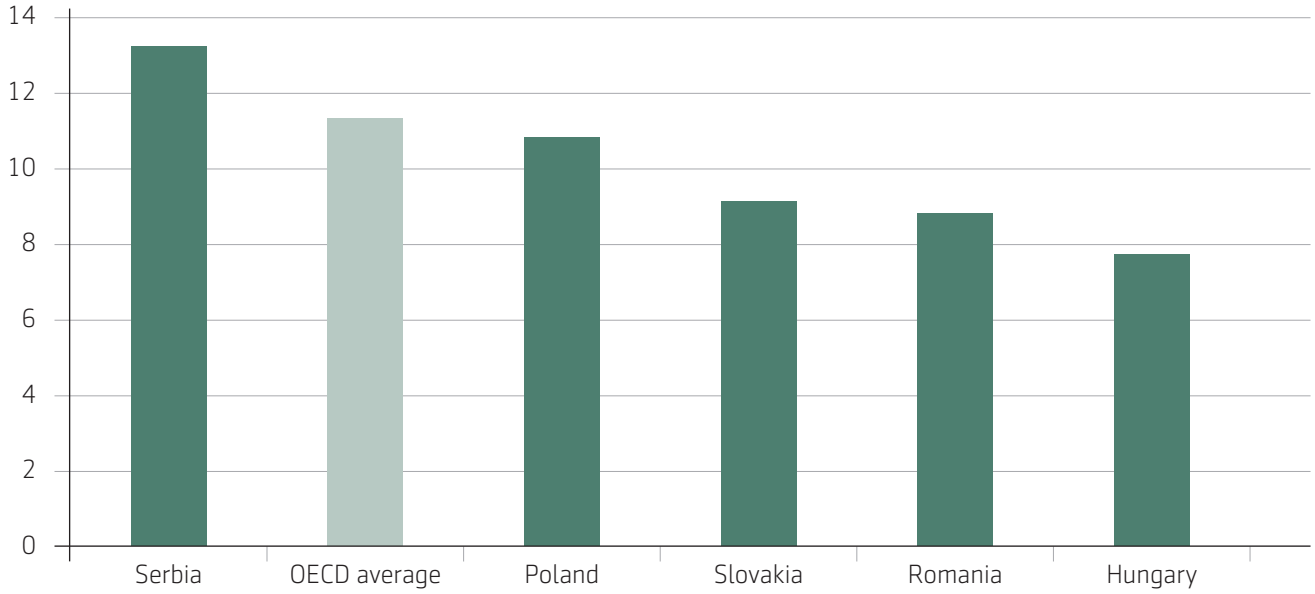
Source: The World Bank's public database: https://data.worldbank.org/indicator/SE.PRM.ENRL.TC.ZS

Figure A11 ▲ Population in formal education by age in 2018 (%)



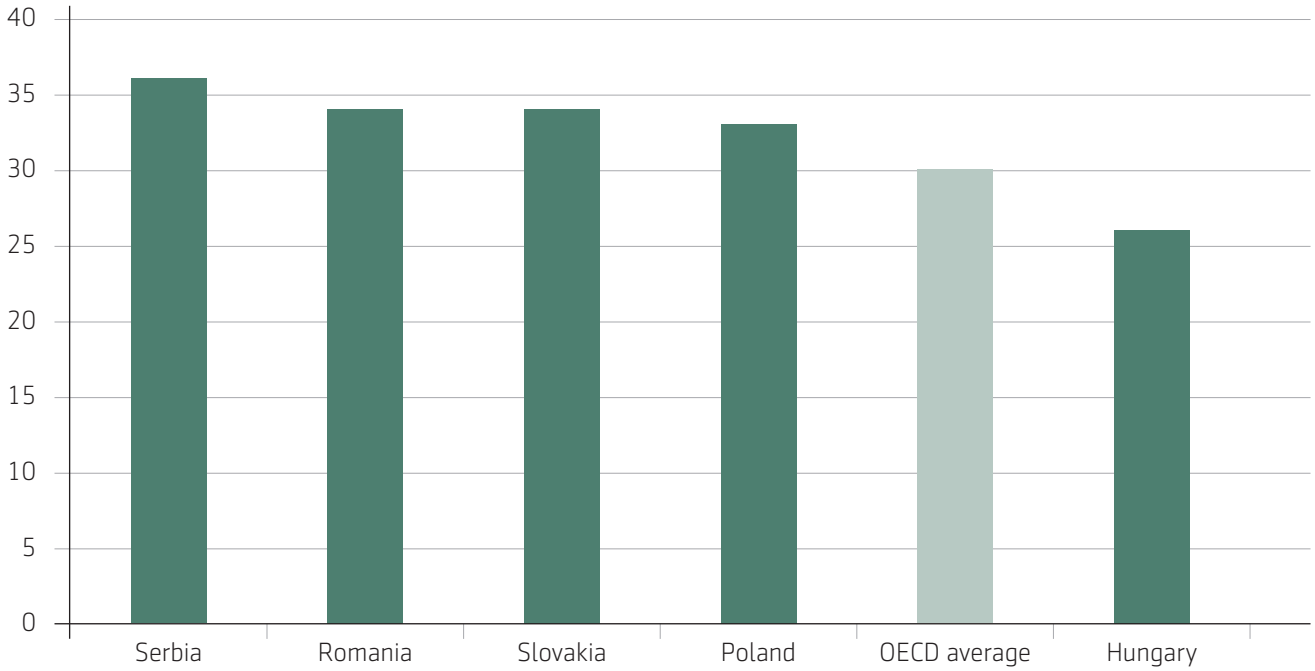
Source: Eurostat (2021)

Figure A12 ▲ Resilient students (students in the bottom quarter of the ESCS index who perform in the top quarter of students internationally at reading), PISA 2018



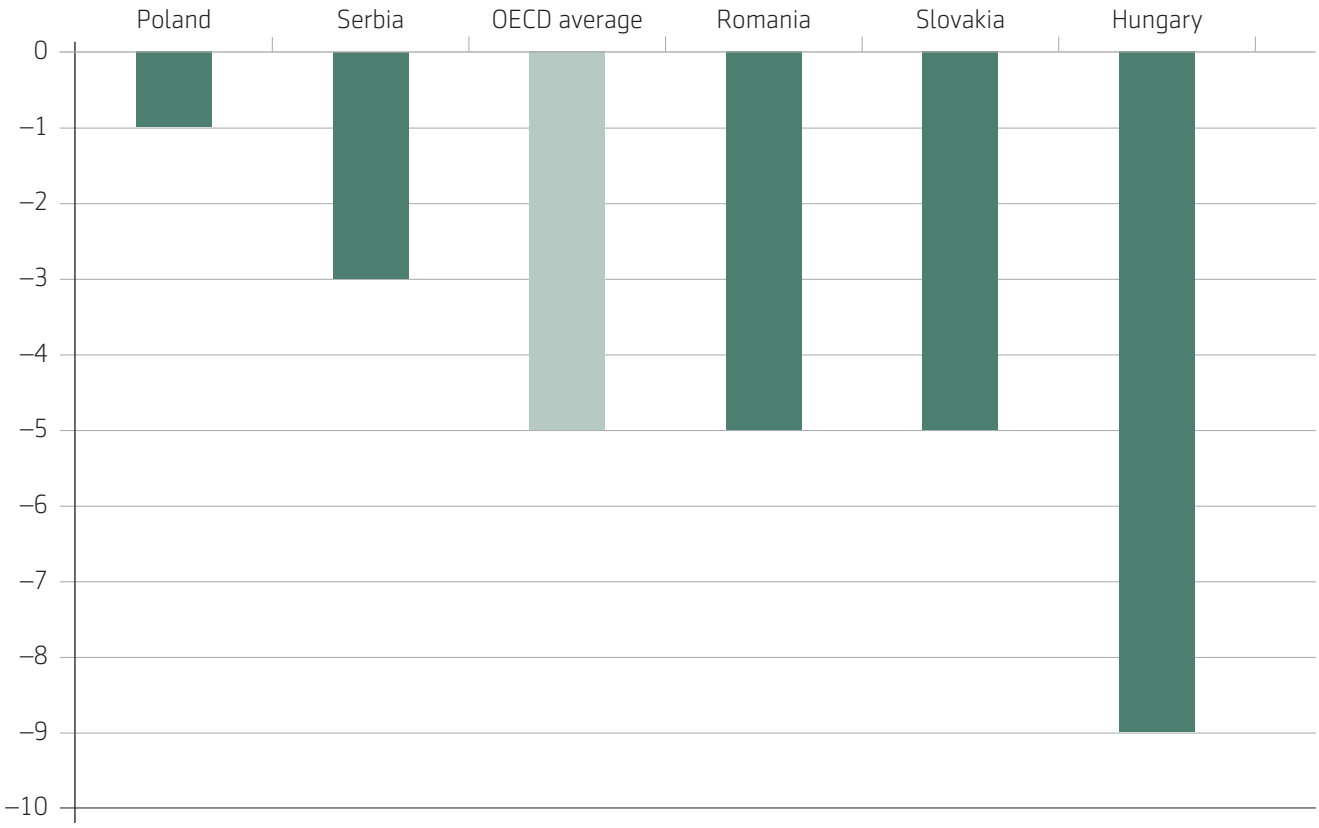
Source: Program for International Student Assessment (2018)

Figure A13 ▲ Gender difference in reading (female–male), PISA 2018



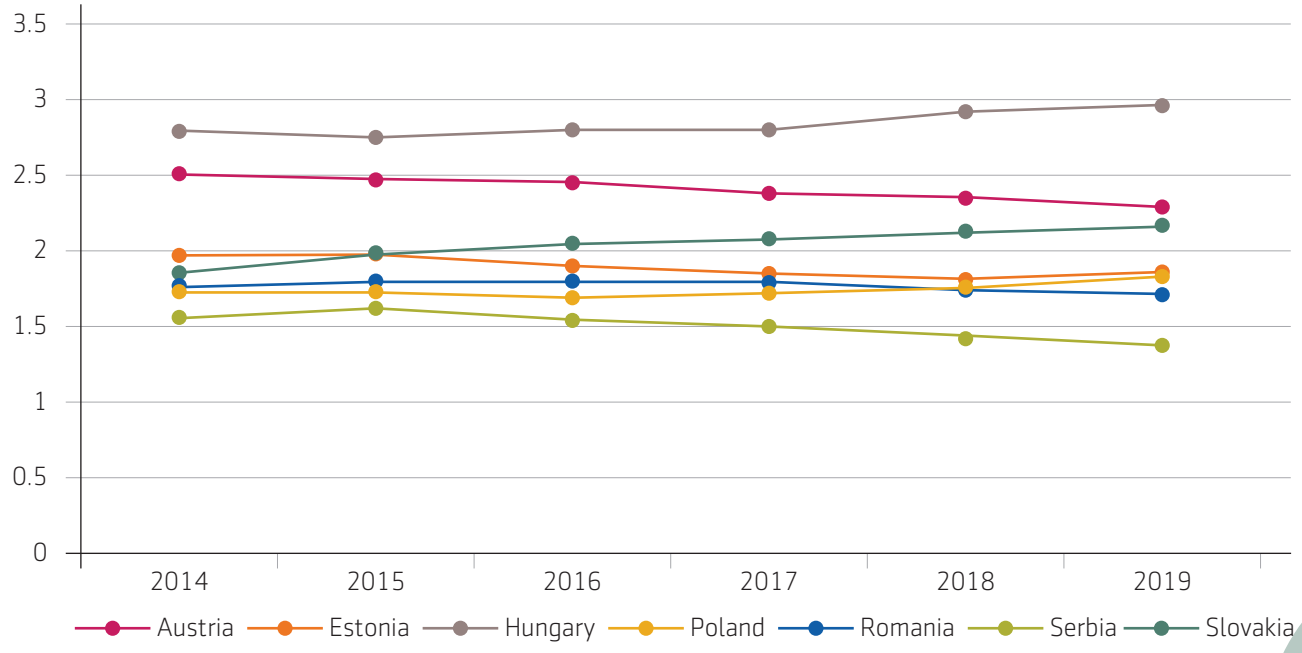
Source: Program for International Student Assessment (2018)

Figure A14 ▲ Gender difference in mathematics (female–male), PISA 2018



Source: Program for International Student Assessment (2018)

Figure A15 ▲ Ratio of men (compared to women) in STEM education (ISCED 5–8)

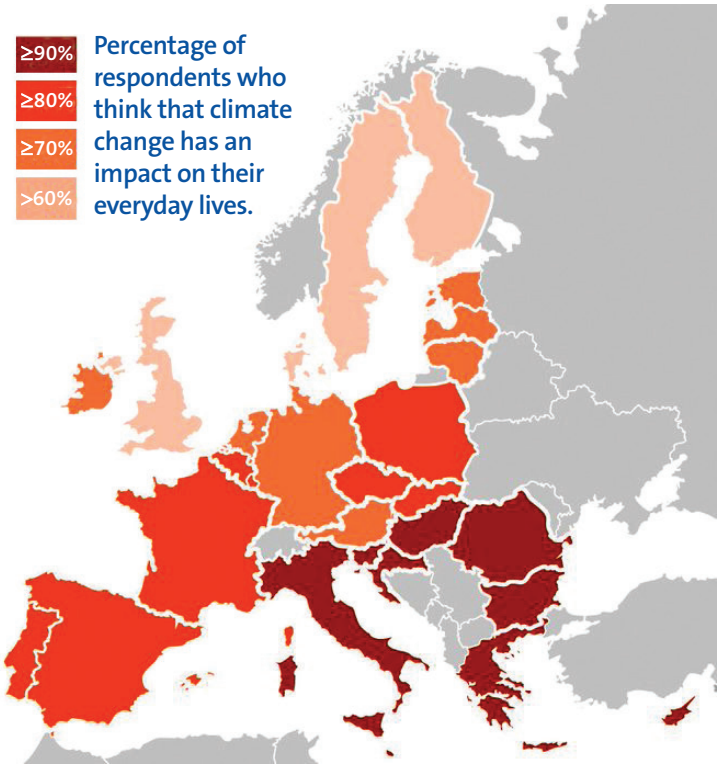


Source: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=educ_uoe_enrt04&lang=en

Figure A16 ▲ Impact of climate change on peoples' lives by country

EIB Climate Survey

In **Eastern and Southern Europe,** more people feel the impact of climate change on their everyday lives.

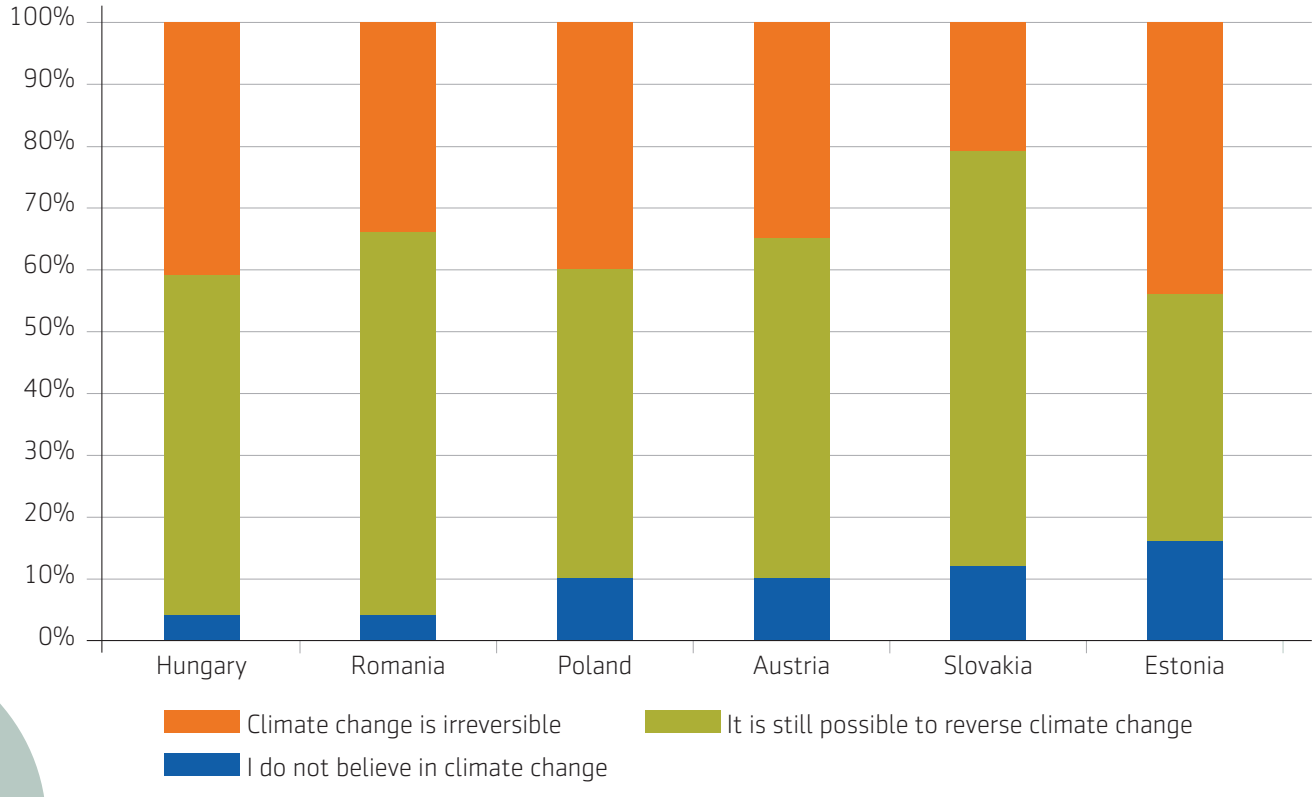


European Investment Bank The EU bank

Source: BVA for the European Investment Bank

Source: https://www.eib.org/en/publications/the-eib-climate-survey-2020-2021.htm

Figure A17 ▲ Beliefs about climate change



Source: https://www.eib.org/en/publications/the-eib-climate-survey-2020-2021.htm

Table A1 ▲ Challenge Matrix: how are schools and educators affected

	access	skills	knowledge	teaching method	institutional organization
Populism, autocratic regimes	exclusion, segregation, political control	critical thinking, fact checking, rhetoric, debating	media, economic and social studies, manipulation and rhetoric	critical content analysis during class and home activities, debate, classroom participation (forum of ideas), opinion essays	practice democracy, strengthen professional leadership and (financial) independence of schools
Technological change	digital +/–	IT, info management, learning skills	interpretation, big picture vs. facts	flipped classrooms and the presence of digital technologies in class	digital preparedness of schools and teachers (culture, technology, and competence): opportunities to learn and develop, direction and leadership, functioning digital equipment, an environment that gives teachers the flexibility to experiment, IT professionals at school
Globalization, internationalization, (migration)		languages, social skills, IT skills	global history, macroeconomic trends, cultures		student exchange programs, summer schools, etc.
The transformation of labor markets	LLL	soft skills, language, IT, learning skills	effective study methods	learning-by-doing, group work, case studies, flipping the classroom, long-term projects, peer editing/ feedback, differentiated teaching strategies, etc.	mobility, school adaptation ("shooting at an accelerating target"), central pressure of suboptimal policies (especially: demand for vocational skills)
Demographic changes (migration)	LLL parents' education	ageing → care, language diversity	tolerance (of atypical families)		parents' education, fewer students per school → school mergers vs. more versatile teaching staff, what to do with school conservation policies, financing rules
Old and new inequalities + regional differences	exclusion, segregation		concepts of social justice, equity and inequality, social responsibility	differentiated teaching strategies	goal: more mixed-ability, mixed-ethnicity schools and classes (e.g. the admission system) learning material (textbook) check for equality and tolerance
Changing gender roles	vocational training and STEM subjects	critical thinking	history and current status of gender differences, concepts of social justice, equity and inequality		promote all kinds of learning pathways (e.g. STEM) for both genders, delay specialization (both within and between schools) learning material (textbook) check for gender equality
Climate change		fact checking, changing (and sticking to new) habits	the science of climate change and its social impacts, social responsibility, ways to reduce one's climate footprint		green schools