

Expert Perspectives on Creativity and Innovation in European Schools and Teacher Training

Enabling factors and barriers to creativity and innovation in compulsory education in Europe, based on interviews with educational stakeholders

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Preface

This report has been prepared by Futurelab and the Institute of Education (IOE), London, with the support of the Institute for Prospective Technological Studies (IPTS).¹

The report is part of a project on 'Creativity and Innovation in Education and Training in the EU27 (ICEAC)' carried out by the Institute for Prospective Technological Studies (IPTS) in collaboration with DG Education and Culture, Directorate A, Unit A1. This project aims to provide a better understanding of how innovation and creativity are framed in the national and/or regional objectives and applied in educational practice at primary and secondary level. It collects and analyses the present state of affairs in the Member States as regards the role of creativity and innovation in primary and secondary schools. The project started in December 2008 and the following methodological steps were taken:

- A scoping workshop (held in Seville on 23-24 February 2009);
- A literature review on the role of creativity and innovation in education by IPTS;²
- An analysis of curricula by Empirica;
- A report on a teachers' survey conducted by IPTS and European Schoolnet and analysed by IPTS with the support of the University of Seville;
- This report on Interviews with educational stakeholders by Futurelab and IOE;
- A report on good practices by Futurelab and IOE;
- A validation workshop (held in Seville on 1-2 June 2010);
- A final report.

More information on the project can be found at:

<http://is.jrc.ec.europa.eu/pages/EAP/iceac.html>

More information on current and past projects on ICT for learning can be found at:

<http://is.jrc.ec.europa.eu/pages/EAP/eLearning.html>

The studies and results of the IPTS Information Society Unit can be found on the Unit website:

<http://is.jrc.ec.europa.eu>

¹ IPTS is one of the 7 research institutes of the European Commission's Joint Research Centre.

² See http://ftp.jrc.es/EURdoc/JRC52374_TN.pdf

Executive Summary

This report provides an overview of enablers and barriers of creativity and innovation in compulsory education in the EU27 according to educational stakeholders from different fields of education, namely: academia, teacher training institutions, inspectorate boards, curriculum development agencies, and the Ministries of Education.

The aim of this report is to provide a general picture of the role of creativity and innovation in schools according to the opinions of the experts who were selected. It pays special attention to the ways in which ICT could enable creative and innovative practices in schools.

For this aim, 80 interviews were carried out in the 27 Member States, with 3 interviews per country except in a few cases. In order to provide a wider picture of the current educational situation in the EU27, it was decided not to limit the interviews to stakeholders who are directly involved in developing creativity in education, but to choose experts who have an extensive knowledge of their countries' education, regardless of their involvement in creative and innovative projects. An effort was made to provide a selection of different job profiles so as to have an assessment of educational standard practices from different angles in each country.

The diversity of educational systems throughout the EU27 makes it difficult to identify a cross-national set of enablers and barriers for the implementation of creativity and innovation in schools. However, a series of trends can be sketched. The most common picture across Member States is that there are a number of schools, teachers, training institutes and projects where creativity and innovation are blooming. Nevertheless, these pockets of innovation remain isolated and in need of systemic support and interventions to proliferate to a larger scale. Policy makers could have a crucial enabling role in the dissemination of these good practices.

Several experts point to the need to **tackle innovation in education in a holistic manner**: for instance, changes in curriculum can be undermined or disregarded if they are not matched by changes in assessment. Moreover, policies encouraging league tables and testing teachers' performances are inhibiting many forms of innovative and creative teaching and learning. Teachers and heads who need to meet targets are less likely to engage in innovative and experimental paths as they are afraid of deviating from the norm. In addition, policies are seen by some experts as being out of touch with school realities.

School curricula should be inspiring, flexible documents, leaving time and space for teachers and learners to think, imagine, create, and deviate from what is prescribed. Curricula are very often content-heavy and over-loaded, resulting in compartmentalised timetables which leave no space for engagement and flow.

Educational institutions are in many cases resilient to change. In several institutions across Europe there is a strong ethos of control, and hierarchical relationships – between heads and teachers, between teachers and learners – are the norm. Discipline is highly regarded. All these factors contribute to an environment which stimulates conformance and punishes or discourages divergence, thus hindering creativity in

teachers and students. Constraints can also arise from the way that school space is organised architecturally.

Traditional methods are still common in many countries. Several interviewees recognise that frontal teaching, teacher-centred interactions and chalk and talk continue to be widespread educational practices. Many teachers and parents defend and believe in 'transmission' modes of learning. Repetition, copying of factual information and rote learning are still happening too often, according to some experts. There are nevertheless pockets of innovation but the challenge is to sustain and upscale them. Teachers are very often isolated and lack the support needed to become reflective practitioners.

Summative assessment and tests do not allow learners to express their creativity. Traditional assessment methods, based on factual recollection and knowledge acquisition, leave very little space for creativity. The pressure of having to teach and learn for tests makes teachers and students risk-averse. This has a strong impact on pedagogies and methods, which are heavily influenced by the assessment system. According to the interviewees, this emphasis on grades limits learners' creative potential. This area is particularly delicate, as different stakeholders – teachers, parents, students and policy-makers – seem to share the conviction that tests, factual recall and grading are the only way to monitor learners' performances and progress.

ICT facilities are available in many countries. There are nevertheless important national differences: in some Member States, interactive whiteboards (IWBs) and computer rooms are to be found in most schools, while in others there is, according to interviewees, a lower share of computers per child. Very often computers are concentrated in computer suites, which are too often used only for a restricted number of subjects or not used at all because teachers are too pressured to take students in from time to time. Mobile and handheld digital devices have not yet found their place in the classroom.

The use of ICT is not necessarily innovative. Many respondents are quite critical of the current use of ICT, stating that it is often taken as an up-to-date pen and pencil method. Interviewees claim that IWBs and projectors are exploited through frontal teaching, and their interactive potential is left to one side. There seems to be a tendency to believe that one can do the same thing with digital technologies as with analogue tools. More student participation and interaction during classroom practice could lead to the development of creative and collaborative skills.

Innovative use of ICT depends on the willingness and preparation of individual teachers. Several teachers and projects are using ICT in innovative ways. They need to be supported and their innovative practices shared. Too many teachers assume that they need to be more competent than their students in order to use technologies in class, whereas interviewed experts do not think this is the case, as teachers could work in partnership with students.

A shift in the culture and mindset of teachers and other educational actors is called for. Many respondents assert that creative and innovative teaching practices largely depend on the cultural attitude of stakeholders. There needs to be a consensus on the importance of creativity in education. This should include the attitudes towards

creativity of parents and students, who are often reluctant to change established practices.

Initial Teacher Training (ITT) and Continual Professional Development (CPD) are the key for a change in teachers' mentality and practices. Teachers need support in terms of training to be up-to-date with innovative teaching practices. The interviewees assert that very often ITT is based on subject content rather than on pedagogical development, particularly for secondary school teachers. This has a possible negative influence on the ability of teachers to put their knowledge into practice once in the classroom, as they are not trained for that. In other countries, however, the time spent in the classroom is squeezing out time for theoretical and reflective explorations of innovative methods. There needs to be a balance and an integration of theory and practice, of pedagogies and subject knowledge. Another important issue is CPD, as teachers tend to settle in and be reluctant to innovate after a few years in the job. Moreover, teacher trainers are not necessarily innovative themselves and, in many countries, tend to perpetuate old and traditional ways of teaching. In addition, teacher training curricula should be updated.

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List of Abbreviations

CPD	Continual Professional Development
ICT	Information and Communications Technology
ITT	Initial Teacher Training
IPTS	Institute of Prospective Technical Studies
IWB	Interactive Whiteboard
JRC	European Commission's Joint Research Centre
OECD	Organisation for Economic Co-operation and Development
PISA	OECD Programme for International Student Assessment

1. Introduction

1.1 Focus

The reported study builds on current research being carried out for the Institute of Prospective Technological Studies (IPTS)³ on the topic of Creativity and Innovation in compulsory education in European Member States.⁴ In particular, the expert perspectives discussed and reported in this study extend research on teacher perspectives and curriculum documents by examining how Member States are structuring and supporting Creativity and Innovation in their educational policies and practice. Our report complements existing studies by summarising the views of targeted educational stakeholders – mainly school inspectors, teacher trainers and academics – in order to recognise and conceptualise the importance and practical setting of Creativity and Innovation in compulsory schooling in Member States.

The main **research questions** addressed by our study are:

- What is the level of creative learning and innovative teaching taking place in schools, according to educational stakeholders?
- What are the links between educational policies on Creativity and Innovation and educational practices according to educational stakeholders?
- What conditions enable good practices of creative learning and innovative teaching in Europe?
- What conditions are viewed as barriers to creative learning and innovative teaching by expert stakeholders?

1.2 Research Approach

Our research approach has been underpinned throughout by a belief in and commitment to the notion that promoting creative and innovative approaches within education is essential (Ferrari, Cachia and Punie, 2009). We hold the view that, in what is often considered to be a knowledge society, Creativity and Innovation must go far beyond the arts in education. Often viewed as vital for economic recovery and sustainability, the wider benefits of creativity for education and learning have been explored through literature examining the 'rhetorics' of creativity. These include themes such as 'play and creativity' in reference to the enduring claim that childhood play is the origin of adult problem-solving and creative thought; 'ubiquitous and ethical creativity', that creativity is a skill which supports individuals to have the flexibility to respond to problems and changes in the modern world and one's personal life; 'creativity for social good', that promotes creativity as a means of social regeneration, personal empowerment and reintegration of socially excluded individuals (Banaji and Burn, 2007/2010; Banaji, forthcoming).

³ The Institute for Prospective Technological Studies (IPTS) is one of the seven scientific institutes of the European Commission's Joint Research Centre (JRC). The mission of IPTS is to provide customer-driven support to the EU policy-making process by developing science-based responses to policy challenges that have both a socio-economic as well as a scientific/technological dimension.

⁴ <http://is.jrc.ec.europa.eu/pages/EAP/iceac.html>

In line with this approach, this report provides a critical summary of how educational stakeholders from government, policy, research, the inspectorate, academia and teacher training understand and experience practices of creative learning and innovative teaching in schools in EU Member States. We convey our sense of these perspectives by providing a detailed explanation of the enablers for and barriers to good practice in this field within the wider context of educational policy and institutional innovation.

1.3 Methodology

1.3.1 Selecting expert respondents

Our methodology for identifying educational stakeholders built on work already undertaken in this field (Banaji and Burn, 2007; Banaji, 2008). In this process, policy-maker, stakeholder and academic discourses on creativity and education were mapped via an extensive literature review, an expert seminar and discussions with leading experts such as Julian Sefton-Green and Ken Jones on creativity and schooling in the UK.

The methodology for the current project comprised a range of different strategies to take account of the different groups of stakeholders involved and, if possible, to triangulate the perspectives received:

- The names of the first 20 experts were provided by IPTS. Another 20 names were suggested at a later stage. Not all experts suggested by IPTS replied to our request to be interviewed.
- Further experts were identified via an extensive review of current and ongoing work at national and international level in the intersecting fields of education practice, education policy, teacher training, Creativity and Innovation. Evidence used to select experts included recent research reports, conference papers, ongoing projects in this area, website profiles, peer-reviewed journal articles and policy briefings.
- We identified experts who have contributed to the following: The Handbook of International Creativity (2006) and The Routledge International Handbook of Creative Learning (Forthcoming 2010, Eds. Julian Sefton Green, Pat Thomson, Liora Bresler and Ken Jones)
- We mobilised existing expert contacts developed through the production of an international literature review produced by Banaji and Burn (2007).
- We identified relevant stakeholders for interview through a range of intermediary individuals and organisations including European Schoolnet – the membership of which includes the ministries of all the countries of the European Union and the work of which focuses on developing learning for schools, teachers and pupils across Europe (see <http://www.eun.org/web/guest/home>).
- We mobilised existing expert contacts developed through other multinational European projects in which the research team has participated. These projects include: Mediappro - funded under the EU's Safer Internet Action Plan (<http://www.mediappro.org/>); Reintegration Transnational Evaluation of Social and Professional Reintegration Programmes for Young People – funded under the EU's Leonardo Programme; Chicam (funded under the European Union's Framework 5 programme); Civicweb (www.civicweb.eu, Funded under the European Union's Framework 6 programme).
- We mobilised existing expert contacts established through our Creativity and Innovation, media and digital literacy and education networks (built, for example through Futurelab's work on the Enquiring Minds programme, see <http://www.enquiringminds.org.uk/>).

- We contacted experts highly recommended by one or more other experts interviewed for this project.

Although a preference has been given to respondents who were experts in creativity for education, we also contacted people who did not work specifically on creativity but who held a wide expertise in compulsory education in their country, in order to have a more balanced assessment on the perception of the relevance of Creativity and Innovation in policies and practices in the EU27. In some cases, the categories of 'inspector', 'teacher trainer' and 'academic' to which we were initially working did not easily map from country to country. For instance, some countries do not have an identifiable 'inspectorate', while in other cases there is little distinction between academics and teacher trainers or researchers and policy-makers. In these instances, we called upon experts from the fields of policy and the quality assurance or advisory branches of national education ministries, or curricula development agencies. We also included many experts with a remit for teacher in-service training, educational research and continual professional development. The expertise and standing of all respondents was agreed and validated by the project team at IPTS before being contacted for interview.

1.3.2 Contacting the expert respondents

We contacted respondents initially by email. In some cases we followed up the first contact with a second or third written reminder about the request, and in others with one or several more telephone calls if such details were available to us.

Issues encountered during the contact process were varied and generally related to the high status and hectic work schedules of our expert contacts.

Many respondents simply did not have the time to take part; others were not comfortable with giving interviewees in English or were uneasy about providing their perceptions rather than providing factual data and felt that they did not have appropriate expertise. On these grounds, 27 contacted experts declined to participate. 15 contacted experts did not respond and 5 proved uncontactable via email or telephone.

Finally, the research team digitally recorded and documented interviews with 80 educational stakeholders: three experts from all of the 27 countries except for Member States presenting a regional difference (See appendices 1 and 2 for details). The interviews also included four experts from pan-European organisations who provided an over-arching perspective of the relevance of Creativity and Innovation for education. In a very small number of cases reluctance of experts to respond combined with our tight time schedule resulted in less than the full quota for each country being possible.

1.3.3 Conducting the interviews

We addressed issues of language in interviews through our extensive experiences of interviewing international experts and stakeholders for previous projects; in a small number of cases where appropriate stakeholders were unable to contribute in English to the project, the research team drew upon a team of Masters and Doctoral students with a wide set of language capabilities.

We conducted most interviews via Skype and used digital recorders or software to record these with the explicit permission of interviewees. Interviews lasted between 30 and 75 minutes, depending on the availability and engagement of the stakeholders being interviewed. These were not transcribed in full but were written up by our research team to coincide with areas of interest as outlined in the thematic questions for stakeholders. In a very small number of cases, we employed researchers to carry out interviews in other languages where the expert was unable to carry out the interview in English. The researcher then wrote up the interview under our guidance.

1.3.4 Thematic Analysis

A topic guide was provided by the IPTS project team, which was based on a literature review highlighting a series of enablers for creativity in education (Ferrari, Cachia, and Punie, 2009). This topic guide was developed and refined by the research team. The different areas of the topic guide (namely: curricula, policies, pedagogies, resources, tools, digital technologies, assessment strategies and barriers for innovation and creativity) were utilised by the team in the following sections on 'Enablers' and 'Barriers' for Creativity and Innovation. As the interests of both the project team in IPTS and the research team focus on the area of new and digital technologies for learning (Redecker, Ala-Mutka, Bacigalupo, Ferrari and Punie 2009; Selwyn, Potter and Cranmer, 2010), emphasis has been given to the topic of ICT in schools. Ultimately, it was decided to merge resources, tools and technologies (ICT in schools), however, to reflect the view of many of our experts said that the separating out of these issues in policy and practice was detrimental to understanding how they can and should be integrated.

There are, however, broader and better-known national factors mentioned by expert interviewees that inform our perspective on barriers and enablers for Creativity and Innovation in education and teacher training in the EU27 but are not individually discussed here. For instance, alongside analyses of the role and relevance of Creativity and Innovation in compulsory education and teacher training within national education systems, insights about the histories, contexts and implementation of the education systems in the 27 Member States were also discussed by the 80 experts and included in summaries. Regional cultural and linguistic traditions, histories of occupation or dictatorship, regime changes, the inevitable influence of different ideological and political philosophies on educational structures are all named repeatedly by interviewees as affecting the context in which policies are made and curricula written. While we hope to explore elsewhere the connections between such factors and daily practices in classrooms, it would not be appropriate given the brevity of this report to do so here.

1.3.5 Robustness of the data

Expert interviewees emphasized four different levels of certainty about the perspectives and information they contributed. Due to restrictions in the space allocated for writing up notes from interviews, these cautions and caveats about differing levels of knowledge and experience are not always reflected alongside each point made and should be kept in mind when reading the report. The overall **levels of certainty** expressed fall into the following four categories:

- 1) personal opinions/knowledge of these expert interviewees, supported by personal or anecdotal evidence;

- 2) professional opinions/knowledge based on extensive work-life experience and research of classrooms, curricula, teachers, policy, teaching and/or inspections;
- 3) professional opinions/knowledge based on their own research or that of others that they have read and/or worked with;
- 4) 'examples' based on textual evidence such as websites, reports, curricular documents or books that they can refer us to and/or send us.

Notably, each of these four levels depends on a) the self-reflexivity of the experts concerned b) their specific professional and disciplinary contexts and c) their overt or implicit ideological perspectives. Interviewees move between these levels when talking about subjects most familiar to them and those less so in relation to our topic guide. Additionally, our expert interviewees often qualify statements by explaining that they cannot speak for and about all schools, all teachers, all colleagues or for a whole region or country. In this context, we have to reiterate a longstanding warning connected to such social research – these interview summaries must be viewed as insights and perspectives about trends and circumstances to guide further research and not as precise historical accounts of specific national education systems.

Further, there are degrees of accuracy even within experts' accounts: professional and personal opinions and knowledge are inflected by the interviewees' degree of association with the particular education system they are speaking about. For instance, in a number of cases, although most certainly not all, it must be noted that some expert interviewees wished to represent their country's education system, or the academic institution they worked for in a favourable light because they were highly identified with aspects of the system. However, notably, as will be seen in many cases, merely being employed by a government/inspectorate or teacher training body does not imply that the expert interviewees are unwilling to be critical of these institutions and systems. We have an equal number of cases where expert interviewees with 'insider' perspectives on the systems and institutions they discuss are highly observant, detached and critical.

In light of the above caveats, it is imperative that the testimonies of the experts in this report are received within this complex context. Most of them, while having been teachers, do not currently spend every day in a classroom. Often they have regular contact with teachers but not with parents or children, while others visit schools every day. Any data based on talk and summaries of talk, as well as opinion, translation and relative knowledge, has to be viewed within a qualitative interpretative framework (Denzin and Lincoln 2000; Kvale 1995) but with a constant analytical orientation towards triangulation (Miles and Huberman, 1984). Our report, in summarising such expert talk, presents a selective snapshot of education systems, policies and national or local educational practices in relation to innovation and creativity. Nevertheless, the high levels of coincidence in the views, knowledge and opinions of many of our expert stakeholders in relation to national patterns and international compulsory education policy, teacher training, curriculum development, classroom pedagogy, assessment, educational ICT use, creative learning and innovative teaching suggest that collecting data from expert stakeholders in a careful, systematic and rigorous manner, as undertaken here, can yield sharp and pertinent insights for policy and practice in education and teacher training.

It should be noted at the conclusion of this section that by the evidence of expert interviewees in inspectorates, teacher training, research, policy and academia, the

enablers for creative learning, innovative teaching and excellent practice as outlined in this summary do not occur as frequently, widely or consistently across the EU27 as the barriers. Most of the barriers – with the exception of those linked to very specific policies on teacher allocation to school districts, recent political events or union politics – are mentioned frequently by most experts, across the different fields in Eastern, Central, Western and Southern EU27 countries.

Where barriers are said to be entrenched after long years of 'traditional' emphasis in curriculum and policy or for social and historical reasons, some of the enablers, in fact, are mentioned by experts we interviewed as existing only in 'pilot' stages or 'research project schools', while others are widely and successfully practised in two or three countries but have failed to be initiated in others. There are, of course, some excellent and innovative practices that occur in all countries, but which are practised only by the most confident and more experimental teachers. In some countries these happen to be the teachers who have been in the profession between one and two decades and who are less apprehensive about being seen to resist top-down initiatives that are not conducive to creativity, while recognising and implementing policy changes which are conducive to innovative and creative teaching and learning. In other cases these are the open-minded teachers, whether young or old, who are willing to concede some space or place to children's perspectives in the classroom and who do not fear a loss of control.

In rare cases mentioned there are teacher practitioners who are also academics and share an interest in creativity. These teachers have put into practice and successfully innovated in their classrooms an astonishing number of the best practices regardless of the regime they find themselves working under. In a very small number of cases these teachers have been supported by their senior leaders and have gone on to spread their ideas across a school district. While the enablers are seen as scaffolding or embodying the very best practices in this field, many experts in our sample suggest that in some cases the mere removal of some of the barriers would act as an impetus for Creativity and Innovation in their education systems.

2. Effective and Innovative Enablers⁵ for Creativity in European Schools and Teacher Training

The diversity of the EU landscape makes it difficult to identify a cross-national set of enablers and good practices in relation to innovative teaching and creative learning in compulsory schools. As experts suggest, there are big differences in Europe, ranging from creativity being paid lip service or enshrined in 'rhetoric' and 'discourse', to it being really valued in educational systems, with serious attempts of integrating it in systems of accountability. The most common picture is that of occasional training colleges, teacher trainers, schools or teachers providing examples of excellent and innovative practice, valuing of student agency and the consequent development of creative learning in students. This is neither systematic nor widespread across all of the countries surveyed. Notwithstanding such diversity, some common themes have emerged which point the way forwards for compulsory education systems at both macro and micro levels.

2.1 Educational Cultures and Creativity

- Creativity is consistently seen by experts in interviews as a vital aspect of education, necessary in order to equip younger generations of learners with flexible and adaptable skills for a knowledge society, as one interviewee put it: "we have no idea what the future demands from us so we have to be flexible".
- In the testimony of experts from all countries there are excellent examples of good practices but there is also an awareness of a significant lack of a system to disseminate and 'expand' such ideas and methods. Policy makers could have a crucial enabling role by developing mechanisms that allow dissemination and cross-fertilisation.
- Some interviewees point out that for an education culture to move in the direction of Creativity and Innovation, different aspects of the system have to change in a holistic manner. Changes in curriculum can be undermined or disregarded if they are not matched by changes in assessment. They are most successful where they are embedded first in changes in pedagogic culture and teacher training before being implemented. For instance, in Italy interesting innovations are being introduced thanks to the recent 'national system of learning evaluation',⁶ which is trying to explore new assessment systems in secondary schools. According to one of our Italian experts, these recent developments have more potential for stimulating change than the regular introduction of new curricular directives.
- National educational cultures, which are already said to be generally supportive to Creativity and Innovation, could also benefit from a more critical and reflective understanding of creativity, which takes into account the multi-faceted nature of agency. For example, many teachers in Greece are apparently concerned with the 'darker' aspects of creativity, namely the fact the many students use their creative skills for divergent purposes, to circumvent school rules. In the Republic of Ireland, creativity also means that schools in more deprived areas have adopted, out of

⁵ As discussed in the introductory methods section, all enablers are drawn from the individual testimonies and perceptions of the 80 expert interviewees who participated in this research.

⁶ See: www.invalsi.it

necessity, alternative approaches to the curriculum to meet the needs of their students. In Latvia, which has been hit hard by the economic crisis, creativity is also seen as a way of coping with difficulties and being resilient: "being creative in a painful way".

- A supportive culture also entails making references to creativity more explicit and engaging practitioners and the wider public in discussions. This can allow definitions and evaluative principles to emerge from practice and from local contexts. Many interviewees note that implicit but unacknowledged assumptions about Creativity and Innovation can be damaging, particularly where they are seen as driving top-down directives. As one interviewee put it, "you have to develop a discourse of talking about concepts, getting used to them, familiarise them with expected outcomes".
- Similarly, a cross-national enabler is acknowledging the cultural and local differences across Europe, and that some themes might have a stronger resonance in some countries, while at the same time being more problematic. For instance, in the former soviet countries the emphasis on creativity meant that teachers were suddenly encouraged to think independently, moving away from uncritical reliance on books and educational models. As one Lithuanian respondent noted, this was not easy as "the mentality of teachers doesn't change very quickly".
- Several interviewees noted the key role that could be played by humanities in enabling Creativity and Innovation. One interviewee mentioned values like "irony" and "eccentricity" which are fundamental aspects of Creativity and Innovation and can only be fostered through a genuine and critical appreciation of the nuances and subtleties of artistic and literary expression.
- Paying much more attention to how school leaders are recruited, trained and supported is seen as a positive enabler for a culture of creativity to thrive in education. In this sense they must focus not only on school management, but also on the ability to be 'pedagogic leaders' and innovative themselves in a way which is sensitive to their context. As one interviewee suggested, "leadership is a very crucial issue, and if not well understood it might become a barrier" and as another noted "toughness in managing a budget or administrative tasks is not to be confused with good educational leadership".
- An example of systemic approach to creativity is a competition for new ideas in Luxembourg, which ran from 2009 to May 2010 and focused on ideas for science and mathematics. Many projects were organised in schools, but a programme of activities was also arranged by the Agency for Lifelong Learning. The resulting initiatives will continue as they are taking advantage of the networks and the bridges that have been built between the different partners involved in the projects: schools, creative organisations and commercial companies. Innovative extra-curricular competitions are also common in Cyprus, Austria and Slovakia: but these cater to a self-selected group of gifted and/or devoted students.
- It is widely held by expert interviewees that teachers need a fairly high level of independence and autonomy within the educational system and within their individual schools, to allow the space for them to innovate within lessons. They need to feel trusted and responsible. They also need to know their students well in order to teach effectively and vary the range of approaches. This occurs more in cultures where consistency and the pastoral role of teachers is valued and maintained through

adequate time allocation to 'group' or 'tutor' time rather than as is often the case in secondary school to subject-specific learning.

2.2 Curriculum and Policy

- Policies that fund the teaching profession well, and provide excellent benefits for those who remain in the profession by ensuring that teaching salaries keep pace with inflation, were seen as positive enablers for Creativity and Innovation. This frees teachers to think about how to improve and refine their practice. Such policies also reward collective good practice and innovative endeavour rather than individual competition between teachers.
- Policies which balance central control with district- and school-level control over budgets, assessment, pedagogic delivery of the curriculum and subject content – rather than being either totally devolved or totally centralised – are uniformly seen by experts as enabling Creativity and Innovation.
- Policies which either give equal funding to schools from a central budget or redistribute income between wealthy urban districts, impoverished urban districts and rural areas – in effect a Robin Hood system – are seen as most likely to improve chances for Creativity and Innovation across a large number of schools and school populations.
- Policies aimed at increasing the importance and understanding of the benefits of formative assessment are seen as extremely beneficial by most experts in our sample.
- Policies targeting teachers who have been in the profession five years or more and ensuring that there is well funded, compulsory continual professional development in a range of skills and theoretical areas are seen to increase the chance for Creativity and Innovation. This was mentioned as taking place in some countries and in some subjects, but was a very rare occurrence overall.
- Policies which give teachers a sense of their own agency and collective competence foster an environment conducive to experimentation and innovation. This allows teachers to carry out peer-evaluations and learn from each other through frequent local network and professional meetings, rather than being evaluated by inspectors or quality assurance leaders.
- A common theme running across the interviews is that there is a general expectation in Europe that curricula need to have a greater emphasis on Creativity and Innovation.
- Curricula which are broad and open, with emphases on products and processes, affective, social and intellectual learning as well as on content and competencies are seen as best practice in this area by most experts. Such curricula are being written and implemented in some countries, particularly in Northern Europe and Scotland.
- Building on the innovations, and generally on the more open approach, of primary curricula is seen as a useful direction for secondary curricula. Often the less restrictive nature of primary curricula allows experimentation and data gathering about innovations in teaching and learning. For instance, one of the Italian experts is currently using games innovatively in primary schools to assess learning and in parts

of the UK there are a range of digital arts and media projects taking place with children in both primary and secondary schools. However it was also noted that these innovations are difficult to export to other contexts.

- Building in requirements for the innovative and active uses of technology for learning alongside requirements for ICT skills in curriculum and policy is seen as essential. This is being done sporadically in some of the countries and cannot be achieved simply by investing in technology.
- Experts in more than half the countries in the EU27 informed us that their curriculum documents had recently been reformed or were in the process of undergoing a change to include a broader and more competency-based curriculum. Best practice in writing such new material to ensure successful implementation was seen as lying in:
 - the scope of the consultation and the type and ways of including views in the new curriculum;
 - the inclusion of coherent, well-informed pedagogic, subject-specific as well as broad, academic, researcher and teacher opinions in the new curriculum;
 - an understanding of competencies as working alongside skills, knowledge and context rather than as replacing content entirely.
- Enablers for best practice in the area of curriculum reform include policies that require school districts, school leadership, teacher trainers, teachers, parents and students to prepare for the changes over an extended period of time. This entails:
 - the piloting and exploration of the new materials with some schools prior to the national roll out;
 - reflexivity on the part of the curriculum authors: learning from mistakes and good experiences in initial implementation;
 - the evaluation and analysis of the pilot findings – with a feedback loop to alter the curriculum if certain aspects are too binding or not emphasised enough;
 - a consideration of all the other changes that might be necessary in order for the new curriculum to work – i.e. changes to practices at a district level, a school and individual teacher level or changes to other aspects of the education system such as assessment regimes and teacher training frameworks;
 - reader-friendly explanations of the changes for parents; opportunities for parents to discuss and understand the changes to the curricula by speaking to education policy makers;
 - time and funding for in-service training of teachers and school leaders in how to understand and implement the new curriculum alongside existing documents.

2.3 Pedagogy

- Allowing students plenty of time during the school day to discuss topics being studied, ask unexpected questions, find their own answers, make mistakes and find solutions to problems is uniformly mentioned by experts from different fields, occupations and disciplines in our sample as a key enabler for creative thought, learning and production.
- Working with students in a collaborative and supportive manner rather than as a figure of absolute authority who stands at a distance is acknowledged to be an extremely significant enabler for creative learning in the classroom and for motivating creative learning outside the classroom.

- Asking open questions that require a combination of critical thought, information acquisition, discussion and reflection is named by almost every expert interviewee as conducive to creative learning.
- Encouraging students to work with those both less and more able and less and more skilled than themselves in different subjects (mixed-ability teaching) is seen as a strong enabler for creative learning by many of our interviewees.
- Within mixed ability contexts, always having extension activities at hand for those more able in particular subjects, and alternative activities or teaching assistants on hand for the less able in particular subjects is seen as preventing boredom and increasing the potential for creative learning.
- Rewarding students rather than punishing them for going against the received opinion in a subject is a key enabler.
- Actively maintaining an atmosphere of respect for all social groups, religions, ethnicities and genders in the classroom is noted by several interviewees as being crucial to successful engagement with and of students in urban schools. Such engagement is a precursor to learning and creativity.
- Allowing open, uncensored but regularly-monitored access to the internet is seen as excellent practice in this area.
- Encouraging students to follow up ideas, topics and questions in their own ways, and across subject areas is seen as a strong enabler for creativity.
- Bringing in students' out of school skills, experiences and knowledge – in areas such as citizenship, caring, music, language and culture is a hugely motivating and enabling experience according to interviewees who have witnessed this approach. In line with this, valuing 'student voice' without trying to control the outcome of what students say is a rare but important aspect of scaffolding their creativity as citizens.
- Giving students some choice and control of what they learn and how they learn was mentioned by a significant minority of our interviewees as increasing creativity. Allowing them spaces in the school where they can move around free from surveillance and meet, talk or debate with each other but feel protected from bullying was mentioned as an important aspect of building students' autonomy.
- Valuing non-standard responses and rewarding divergent or critical answers as positively as other answers encourages participation, motivation and creative thought according to a large number of our expert interviewees.
- Encouraging and requiring all students to speak and to listen to each other during discussions; valuing the outcomes of non-writing based tasks equally with written tasks enables different kinds of creativity and fosters respect for the abilities of others.
- Allowing and encouraging students to work alone some of the time and collaboratively at other times – in pairs, in small groups, in big groups, and as a whole class is said to make for a dynamic atmosphere in the classroom which motivates creative learning.
- Being innovative with space in the classroom – moving things around, allowing students to move around – is seen as a good practice which is more common at primary/elementary school than secondary but would highly benefit secondary students.

- Allowing students to work at different paces with frequent plenary sessions when they can share and catch up was named by several interviewees as an excellent practice.
- Taking students out into their school's local community and into different places and spaces is seen as excellent pedagogy. This can include trips, walks, and data collection exercises to illustrate points about traffic, architecture, or geographical features.
- Calling non-teachers such as poets, artists, botanists, astronomers, and mathematicians into the classroom to discuss their subject area with students is seen as excellent practice to scaffold creative thought and learning for both students and teachers.
- Organising mentoring schemes where older students or those at university work with individuals or groups in the classroom is seen as hugely beneficial for students in both secondary and primary school.
- Showcasing both the processes (through mobile video on ambient screens, podcasts or through paper and pen or printed displays showing workings and thoughts) and the products of students' classroom labour, play and experimentation is motivating and encouraging for students.
- Doing project work, which engages both the imagination of students and requires them to deal with contemporary issues and problems in the world and in specific subject areas, is mentioned as best practice.
- With regard to project work, many interviewees pointed out that for projects themselves to enable creativity the teachers must constantly scaffold students through discussion, feedback, input of information sources, keeping track of time, logging the processes and watching the learning taking place.
- Many interviewees pointed out that projects do not need to be interdisciplinary to enable creative learning.

2.4 Tools and Technologies

- Instances where teachers do not feel threatened by or afraid of new technologies – or constrained by their absence (in the case of very under-funded schools in poorer nations) were mentioned as exemplary. In Bulgaria, Slovakia, Czech Republic and Hungary, for instance, we were told of under-funded schools where students are using nothing more than paints, paper and pencils to draft elaborate designs for architectural, mathematical or artistic projects.
- Where new technologies, such as virtual learning platforms, interactive white boards and graphic design or geographical navigation packages, have been purchased, the provision of regular and non-pressured sessions to train all staff in their effective use is seen as crucial to innovation. Giving staff time to adjust to the new technology is also important in encouraging creative and innovative uses.
- Giving teachers support networks improves the chances of innovative uses of tools and technologies in schools.
- Resourcing of computers and interactive whiteboards in schools is reportedly good in many countries with a few notable exceptions. For instance in one country, it was reported that schools are very poorly equipped in terms of ICT, and only 1% of

schools have computers. In another we were told teachers and students have to wait ten minutes for the operating systems to load. Computers are available in media laboratories or computer suites and in some schools, laptops are also available to be used. Maintaining and upgrading technology before purchasing every latest technology is seen as best practice.

- Building in funding for the support and development of an e-learning plan in collaboration with teachers and with different age groups and ability levels of students is also seen as a good practice, which needs to be considered.
- Broadening children's horizons by introducing them to aspects of technology that they have not already encountered – be these old or new – is seen as best practice. In the Flemish region of Belgium, for instance, some schools have outdoor areas with architectural and building materials and introduce students to ways of working with bricklaying technologies for measurement and support of structures.
- Thinking through the ways of using both old and new tools and technologies – whichever are available – so that students can be active while using them is mentioned by many experts in our sample as enabling creative learning and being a rare example of innovative practice. Examples include:
 - allowing students to build a computer game and trial it on classmates;
 - the use of mobile telephones in the class for finding maps, facts and locations, for orienteering outside the class, and for capturing data;
 - using digital cameras to contribute to ideas about space, place and size in geography and mathematics;
 - using Modern Foreign language programmes on computers to make cartoons and film strips or record and listen to oneself speaking;
 - scanning in paper diagrams or brainstormed ideas from groups and showing them to other groups via projectors and screens;
 - encouraging students to write their own computer programmes;
 - getting students to construct stage sets and screens from cloth, paper and colours;
 - using the body imaginatively to represent ideas, contradictions, problems in physical education, sport, dance, drama, mother tongue lessons, history and art;
 - authoring collaborative essays, stories and poems using ICT or indeed pens and paper for the same;
 - bringing in and collecting found objects – e.g. metals, plastics, cardboard, resins and insect skeletons for categorisation and display;
 - keeping a class pet;
 - growing plants in pots, tubs and window boxes;
 - having books in all subjects, both old and new, accessible in the class and in the library;
 - encouraging students to blog about their learning and ideas;
 - using YouTube to show clips, initiate discussions in design and technology, informatics, science, media, history, civic education and economics;
 - using digital tape recorders to encourage students to make podcasts of stories or topic essays for younger students and/or their parents, or to record their thought processes in design and technology projects;

- Using water and ice imaginatively during lessons;
- regularly asking students to take apart outdated technical equipment – e.g. old cameras, watches, mobile phones and computers – in order to see how they work and what parts are used;
- asking students to build their own machines – e.g. instruments for measuring moisture and wind flow, resistors, etc;
- having an outdoor classroom where biology and geography, as well as literature, art and mathematics, can be taught;
- having an outdoor space where building technologies – materials for building walls, different kinds of bricks, solar panels, mortar, paint etc, can be used, experimented with and stored.

2.5 Assessment

- In best practice cases, for instance in some schools in Wales (UK), Scotland (UK), Denmark and Finland, processes of peer-assessment and self-assessment are explained by the teacher in terms of sets of criteria, and are valued in the day-to-day formative assessment practices of the classroom. Pupils have a sense of what they have achieved, what they need to do to improve both their work and their thinking, and how they can push themselves further in specific areas.
- Innovative assessment occurs when there is a lot of emphasis on talk and discussion not only once the work has been completed, but also during the time it is being carried out. This means that there is no requirement for silence for much of the process, although there are clearly stated and understood rules and rituals for turn-taking and sharing talk-time.
- Expert interviewees testify that whether collaborative, individual or competitive, explaining to students the objectives of particular assessments and making sure that these objectives are tied to students' continual learning, progression and motivation – thus avoiding testing students in order to tell parents a grade, or give schools a rank to please the politicians – is the most enabling practice in assessment.
- In the schools which have given thought to assessment innovation, particularly in parts of the UK such as Scotland, Wales and Northern Ireland, and in Northern European Countries such as Finland and Denmark, pupils share their learning outcomes and objectives with ease and confidence.
- In schools in the countries named above, and in best practice schools in other countries, pupils are encouraged to develop individual thinking and the sharing of ideas by groups and partners. There is generally a collaborative rather than a competitive atmosphere during assessments, although some interviewees stress that competition between groups does not rule out the sharing of ideas.
- Experts across our sample mentioned having witnessed examples of excellent practice whereby the teacher rarely initiates specific questions and instead encourages groups to challenge each other with open questions. Different groups or individuals control the tasks, which are monitored with the use of a timer. In such classrooms, the teacher is not seen to be the ultimate judge of how successful a particular task outcome is because students are confident about their ability to evaluate thoughtfully and fairly their own and others work. This is, interestingly,

attributed both to the ethos of the school and to the confidence of the teacher in leading through a coaching style rather than a didactic presence at the front. In some countries such practice was much more common than in others.

- A single outcome is not demanded by the teacher or the school as a pre-requisite for students' work being judged successful – divergence and difference are valued as much in the outcomes as in the means of achieving these outcomes. In subjects where achieving a specific answer is mandatory – such as some areas of science or mathematics – students are rewarded for being able to find different pathways to the common answer.
- Many interviewees noted that it is possible to evaluate the originality and the creative thinking of students, even in 'traditional' subjects like mathematics and science. For instance, in France evaluating the strategies employed by a student when trying to solve a specific scientific problem is an example of current good practice. This can amount to one third of the entire evaluation. During this type of evaluation it is possible to assess the thinking process behind a problem posed, rather than the correctness of the answer. If the students provide answers which are incorrect, but are able to demonstrate logical consistency and use data meaningfully, they receive the highest mark.
- Some interviewees point to the importance of subjects that have practical components, and in some cases it might be beneficial to set up a second component of assessment where students have to take part in practical exams. This can lead to greater variety in teaching and learning methods.
- There might be some opportunities for assessing creativity even within traditional summative assessment. One respondent acknowledged that it would be unrealistic to advocate the complete removal of summative assessment of knowledge.
- For the most innovation to occur, particularly within conditions where end-of-secondary-school examinations are likely to be a feature of the assessment system which for political reasons in particular countries cannot be removed, experts recommend recourse to a combination with project work and coursework completed over the period of the year. They also emphasise open-book exams, open-ended questions with a problem solving component, critical questions with a discursive and debate component valuing personal opinion, and open-internet examinations.

2.6 Teacher Training, Professional Development and Innovation

- Expert interviewees state that innovation is encouraged when teacher trainers themselves view knowledge as diverse and not on a spectrum from good to bad.
- Many experts state that innovation is enabled when there is an emphasis on research-based practice and on reflexive learning. Where initial teacher trainees and those engaging in CPD are given extensive time to explore problems and difficulties as well as new approaches, and to reflect on 'what went wrong' or 'what went well, and why', they can become more reflective practitioners.
- The ITT curriculum was mentioned several times as a key issue in relation to scaffolding reflective practitioners.

- For instance, there is said to be more chance of innovation in the early years of teaching when the ITT curriculum is not too theoretical, subject-focused or purely academic but includes a range of encounters with different pedagogies and teaching styles.
 - A significant enabler for innovation occurs when the ITT curriculum includes significant teaching practice, in real institutions, with real students. Student teachers need to experience living contexts with multilingual students from different classes and/or ethnicities, whom they might end up teaching in their first school.
 - The ITT curriculum needs to explicitly value innovation and divergence, rather than simply the transmission of knowledge to young graduate teachers.
 - When the ITT syllabus emphasises and provides time to explore assessment pedagogies with practical suggestions on how to develop formative and summative assessments using open-ended tasks and questions there is a much stronger chance of innovative assessment in schools. This is rare according to most experts in our sample.
- Teacher Trainers and those delivering CPD or INSET⁷ need to model open and active methods of teaching and learning with their students, reducing power differences arising from age or experience and attempting to create a non-authoritarian atmosphere in their own classes. This is a key enabler for innovative teaching.
 - There needs to be an emphasis on the importance of the links between imagination, skills, knowledge and competencies, rather than an assumption that there is no connection between subject content and competencies, or between imagination and skills.
 - Much more creative work is enabled when students on ITT courses are shown how to support their pupil's project work throughout the process of the project in a creative manner by identifying all the issues related to the several different topics the students have chosen, organising groups, fostering a questioning creative environment, supporting oral discussion, rather than just selecting a topic and setting a deadline. Students can then do this with their pupils in schools.
 - A significant point made by interviewees working with ITT, CPD and ICT was that social media was enabling teachers in far flung regions of their countries and with long hours of work to catch up on courses, ideas and with colleagues via virtual learning platforms and to collect evidence about their practice via e-portfolios. Although this was not seen to be widely used across the sector, it was a significant enabler for the sharing of innovation and mentioned as a 'Trojan horse' for encouraging teachers to use social media with their own students.

⁷ In-service training. Training for teachers which takes place during the school year.

3. Barriers to Creativity and Innovation in European Schools and Teacher Training⁸

Again, this section of the report gives a broad sweep across Europe showing the scope and predominance of particular characteristics or barriers which emerged in the interviews with educational stakeholders. It is worth noting that over half of the countries appeared to have educational systems which were to some degree changing, often as a result of policy and changes to curricula; and also due to the introduction of, in some countries, digital technologies. Nevertheless, the introduction of new tools - which might have encouraged new practices - does not necessarily mean a transformation in education as the following insights and perspectives focusing on Creativity and Innovation will show.

3.1 Curriculum and Policy

- Government policies in relation to the placement of teachers in school districts and/or the movement of teachers around a country's schools - particularly where this meant that teachers' time in any one school was limited to one or two years - form a barrier to developing collaboration and communities in which innovation can take place.
- Government policies which encourage competition between schools - particularly the practice of using 'school league tables' and of publishing data about individual student performance in public examinations and apparent teacher performance - are seen to be notable barriers to schools developing an atmosphere of innovation, critical thinking and risk-taking conducive to student creativity.
- Restrictions framed by curriculum requirements and subject syllabuses are named by numerous interviewees as inhibiting in some specific countries.
- Content-heavy and overloaded curricula, which leave no time for thoughtful and critical processes and innovative approaches, are widespread across many of the countries in this study, particularly in Western, Southern, Central and Eastern Europe, though less so in Northern Europe/Scandinavian countries.
- A significant but vocal minority of experts in our sample commented that extremely 'loosely' formulated curricula which give all responsibility for the delivery of materials and pedagogic methods over to individual schools were also liable to becoming barriers. This is because they are seen to lack the drive for new methods, and to concede pedagogy entirely to schools, which might be totally 'traditionalist' and passive in their delivery methods.
- Government policies, which see teaching as target-driven and use the inspectorate to 'punish' teachers who do not meet targets, are seen as being completely opposed to a spirit of active innovation and change. It was noted that some countries are planning to follow England in implementing this approach to 'quality assurance' and this is seen as a very negative move for innovation and creativity. As one expert put

⁸ In the barriers section, specific country examples have not been given because this could amount to be an unhelpful 'naming and shaming'. Also, where a view was expressed by only one expert out of the three in each country, we have included it as it may be indicative of a deeper issue, however we would not want to present it as conclusive evidence.

it, teachers “don’t have time to fulfil the obligations and also support the creativity of students”.

- Similarly, another expert noted that often teachers feel “disappointed and frustrated” because they are asked to perform many “irrelevant tasks”, which are detached from their teaching duties. This reduces the time and energy that could be dedicated to fostering creativity.
- Timetabling, linked to the curriculum, often inhibits work across subject areas in secondary schools so there is ‘compartmentalisation’. It is impossible to be creative on demand – teachers need whole days to discuss, plan, play with ideas, risk, make mistakes and develop products and processes. Common timetabling in two to three hour blocks would greatly enhance the possibility of such work. This is affected by a lack of flexibility in curriculum requirements, i.e. a curriculum based on subjects and a qualifications framework that is also based on subjects.
- Educational systems with rigid bureaucratic structures make it hard for creativity to “trickle down” from official documents to the classroom. The aspirational talk and vague aims of central directives often struggle to influence teachers’ professional practices. Because of this, the teacher-centred model is still the most widespread according to many of our interviewees.
- Very often interviewees noted wide gaps between the written objectives of central curricula and what is actually going on in schools. These documents and the policies that underpin them are meant to provide guidance from central ministries, but they are often perceived as out of touch with the actual practices in the classrooms.
- The problem is compounded by the fact that in many EU countries important decisions, for instance about technology provision, are removed from schools and teachers, and are taken by local governments on purely administrative grounds, with little concern for Creativity and Innovation.
- Local area or school policies which restrict access to the internet or to significant numbers of websites are said to reduce the chance of ICT being used innovatively for learning and creativity.
- A lack of evaluation procedures following pilots of new policy initiatives – before either scrapping or implementing them – is seen as a barrier by some experts, particularly researchers and academics.
- Planning and implementing any educational scheme simply for the reason that money is available – or not available – is seen as a barrier by expert interviewees in the research field.
- A small minority of government and policy interviewees asserted that teaching unions were a barrier.
- Issues around funding included:
 - Lack of funding for teacher salaries and for teacher progression, which ties into government policies on education as well as to overall national wealth or poverty – in a large number of interviews with the EU27 experts is mentioned as a significant barrier, particularly inhibiting teacher motivation to innovate or even follow effective child-centred practice.
 - Lack of funding for schools in general, including for teaching assistants, technicians and new resources such as textbooks or even furniture and building

maintenance was seen by some interviewees in poorer European nations as a significant barrier.

- Lack of funding for sustained, well-remunerated continual professional development was seen as a major barrier.
- Lack of funding, time and support for bringing outsiders such as scientists, mathematicians and artists into schools to contribute to children's learning was perceived as a barrier.
- The view of creativity as limited to the arts:
 - The belief enshrined in some curriculum and policy documents that creativity is an arts linked phenomenon is a barrier noted by some. Whilst creativity is very popular in the educational discourse at a policy level, in most cases it is still seen as something to be done within traditional arts subjects. National curricula rarely seem to provide any guidance of how to achieve creativity in subjects other than arts, such as mathematics.
 - This issue is compounded at the classroom level, as many teachers also identify creativity solely with writing, drawing, painting abilities and so forth, struggling to recognise it and foster it in other subjects.
 - Similarly, many of our interviewees confirmed that there are persisting views of creativity as something produced by 'geniuses'. There is still little concern for creativity as a 'process' involved in everyone's lives beyond the arts.

3.2 Pedagogy

3.2.1 The influence of the institution

- Authoritarian institutions, where there is a strong ethos of control as well as a very hierarchical relationship between students and teachers, and teaching staff and managers, have been seen by our interviewees to be highly unlikely to develop innovative teaching or creative learning methods.
- Strategies which put children into class groups or subject groups based on an assumption about their similar ability level – sometimes known as streaming and setting, respectively – was seen as a poor classroom practice. This could prevent class mobility, overall personal development of children; and emphasised one set of target-driven outcomes over and above creativity, imagination, working together and emotional or cultural development.
- Pushing children too early into specialisms or 'vocations', and thus teaching them more of what they are already good at but ignoring other aspects of their education, was seen as a barrier to further creativity.
- Both frequent punitive inspections of teachers' practice or alternatively a complete absence of evaluation of teachers' practice are cited by educational experts as destructive to innovation and creativity.
- In some countries, for example Italy, teachers work with high levels of independence, which often verges on isolation, following established and traditional patterns of practice.

- Resistance to change is also strengthened by the way schools are organised spatially and architecturally (mostly classrooms and corridors), which has a constraining effect on creativity. One interviewee noted that the built environment sends powerful messages to young people in terms of expectations and values underlying teaching and learning.
- However, resistance to change is a complex issue, not to be simplistically dismissed as a backwards attitude. For instance, even in countries with a long tradition of school autonomy and innovation like Sweden, there are discussions about whether it is a good idea to give teachers complete freedom in choosing practices and methods, or whether it should be for the national steering documents and curricula to provide a more uniform guidance, therefore being more restrictive. According to one of our Swedish experts, the system is currently under review, including investigations carried out by the inspectorate, which suggested that Swedish teachers were having difficulties handling high levels of freedom, and many were in fact asking for more specific guidance and directives.

3.2.2 Teachers and classrooms

- The role of teachers in nurturing students' Creativity and Innovation was thought to be key.
- Disciplinary classroom environments, where divergence or failure to conform is punished were stated as barriers.
- Frequently, our interviewees saw a lack of differentiation in methods and 'teaching to the middle' as inhibiting to the creativity of the least and most able students.
- Many expert interviewees commented that in their opinion some teachers' fear of losing control of classes, linked to a lack of confidence in their own classroom management skills, discourages active learning approaches which allow even basic talk in the classroom.
- Some teachers' and parents' insistence on 'transmission' modes of learning – where the teacher stands at the front of the class and talks from notes or reads from a textbook and students sit silently and listen or write notes – are one of the most frequently mentioned barriers across all categories of expert interviewees.
- Closed questions to students, and closed exercises requiring the copying of basic factual information are seen as shutting out creativity by most interviewees.
- An emphasis on repetition and rote learning are also named as barriers and some of the experts said that this happened in classrooms all too often.
- A dualist framework - which sees some knowledge as 'good' and some knowledge as 'bad', and so prevents children from engaging with it - is seen to be a key barrier.
- The fear of risk and harm is seen as a major barrier to allowing particularly primary age children to develop critical and individual thinking and creativity.
- It is difficult for teachers to sustain innovative practices due to institutional pressures. For example, following CPD or training which might emphasise interesting and challenging pedagogy, many teachers revert to a 'default' teaching style which is not innovative on a daily basis.

- In the absence of any time or monetary incentive, there is an added reluctance on the part of some teachers to collaborate in making changes to their practice which will give children more control and enjoyment of lessons but will take more time outside school on their part.
- Some teachers holding closed attitudes towards outsiders from other professions – and hence not bringing artists or researchers into the classroom – was seen as problematic and a barrier to fresh approaches and new skills.
- The speed with which the curriculum has changed in some countries has left some teachers apprehensive and inadequately supported.
- It was said that some teachers don't have the time and energy to be creative themselves which then hinders how far they can nurture their students' creativity.
- In some countries, traditionally, conformism and the reproduction of knowledge have been valued in pupils. Therefore it is difficult to get both teachers and pupils to think differently and therefore creatively.
- There was a strong feeling among experts that within many classrooms, interactions were still teacher-centred.

3.3 Tools and Technologies

- The landscape is very diverse across Europe, but it appears that in several countries curricula and official guidelines are less important in informing practice than habits and conventions passed on uncritically from teacher to teacher. Traditional, textbook-based teaching practices appear to be entrenched and resistant to change.
- Notebooks, paper, pens, colouring pens, rulers, erasers and pencils, as well as art materials and science labs in secondary schools, are still the most common and widespread tools in compulsory schooling across the EU27 according to experts. This is not in itself seen as a barrier to creativity, but the refusal of school districts and/or school leaders to allow children and teachers to use alongside these other handheld digital devices ranging from mobile phones to calculators in learning is seen as a barrier.
- The rarity of modern, innovative and critical textbooks customised for different ability levels and language groups is seen as a severe barrier for creativity in several countries. Textbooks are still the most highly used teaching resource in compulsory classrooms, closely followed by worksheets made on computers or downloaded from the internet.
- Issues around funding included:
 - The cost of good, challenging, new textbooks is seen as a barrier.
 - The cost of equipment in subjects such as music and sports is seen as having an adverse effect on students from lower-socioeconomic backgrounds. The emphasis on ICTs has in some schools come at the expense of other resources.
 - In several of the EU27 countries, experts report government or EU programmes making schools buy interactive white boards, laptop schemes or learning platform environments. In some cases the programme is now over and the money for digital hardware is no longer available - the resources are becoming outdated, and

the training to use the materials is non-existent or is based on school leaders, who send a single teacher to become a 'champion'.

- One of the experts said that there is an ongoing discussion about whether it is better to give teachers freedom in choosing their practices, methods, tools and resources or whether these should be provided nationally to ensure more uniform guidance.
- Some of the experts mentioned that prior to 1999 there was one official textbook per subject, now the teacher can choose. Nevertheless, experts thought that teachers relied on textbooks 'more than is necessary', using these to structure lessons rather than setting clear objectives.
- Government policies, driven by the EU in some cases, which have invested a great amount of funding in new technological hardware, with little funding for software, upkeep, upgrading, e-learning strategies or training of teachers in innovative pedagogies have become a barrier to innovation. Teachers feel that they have to use ICT in their lessons, otherwise they are bad teachers, even where the technology is slow, does not work, wastes time, does exactly the same thing that they could do manually or involves a whole repetition on their part of time and effort.
- The lack of availability of innovative and creative resources online in languages other than English is seen as a barrier by some experts and is named as being seen as a barrier by many teachers.
- Some practices are changing just because of the availability of the internet – more and more homework assignments are based on information searches. This in itself is not innovative or creative necessarily and if it is seen as such it can be a barrier as it replaces time for other assignments.
- Slow internet connections or complete lack of computers that can handle fast connections are named as barriers to the innovative use of free software online.
- In some countries the concentration of computers in computing suites and the lack of space or design which allow the use of computers and internet in classrooms are a barrier. Although the percentage varies across the EU, computer suites are seen as problematic as they are either a) used only for informatics and ICT lessons; b) block booked by certain subjects across the year not allowing other subjects access; c) not used at all as most of the time, as many teachers are too pressured to book in or to take students to those classes from time to time. They are named as being problematic for spontaneous integration of new technologies into teaching.
- A belief that one has to do exactly the same thing with digital technologies as with analogue technologies is seen as a barrier – i.e. cases are reported where Microsoft PowerPoint is used again and again almost like turning the pages of a textbook to deliver copious amounts of graphs, charts and written information. In schools which have the newest and most modern facilities – such as IWBs, projectors, laptops and learning platforms, a lack of imagination and training in how to use them innovatively turns them into "expensive chalkboards and textbooks".
- Local authorities and schools tightly controlling which sites schools, teachers and children can visit is seen as deeply inhibiting to experimentation, risk-taking and creativity.

- There is a lack of sustained, compulsory, integrated and rewarded continual professional development in the area of digital tools and technologies for teaching that is named as a profound barrier by some experts from all parts of Europe.
- Some experts said that teachers lacked the skills they needed to use ICT for teaching and learning, and this is just as likely to be the beginner teachers as the much more established teachers.
- Some of the experts thought that teachers assumed that they need to be more competent than their pupils in order to use ICTs effectively and safely in classrooms. Some of the experts stress that this was not the case and that teachers should work in partnership with pupils.
- ICT is not embedded across the curriculum, and the skills that are taught to students tend to be functional rather than creative and communication based.
- Lack of time to participate in online teachers' networks and subject associations online which do exist in some countries is seen as preventing further collaborative creation of innovative resources.

3.4 Assessment

- Experts in most of our EU27 countries and across all three fields submit that education policies emphasising written summative examinations are seen to inhibit innovation and reduce the possibility of creativity.
- Assessment largely remains a very sensitive and political issue in all educational systems. Many suggested that assessment and testing regimes as they stand are driving creativity out of the classroom.
- A culture of competition between schools based on their national examination results in subjects such as mother tongue and mathematics is seen as extremely problematic and undermining creativity.
- Target setting, which is now entrenched in several European countries' educational culture, is seen to pull school leaders and classroom teachers in two different directions away from creative and innovative teaching. The need to push students to do well in traditional national examinations and to prove that one's students have succeeded in this area is viewed as antithetical to many of the more innovative formative assessment strategies and as devaluing peer-assessment, self-assessment, extended project work and open-ended discussion in class.
- The idea that what one should be teaching and testing a body of knowledge is a huge barrier to innovative assessment and creative assignments. Doing student-centred, active, creative things such as debates, trips, discussions and projects is thus viewed in some countries by some teachers as a 'risk' or as 'a waste of time'.
- The view espoused by many of the experts was that pressure is on in terms of tests, exams and teacher-led assessments. Therefore, we need a much more dramatic shift in the ways that skills are tested.
- In almost all countries, post-primary examinations tend to favour standardised methods aimed at answering specific sets of questions.

- This issue is also related to rising concerns about falling standards in literacy and numeracy in many EU countries, e.g. in the context of PISA evaluations which have a significant influence on national educational policies. According to one expert with a broad understanding of European educational systems, we are “at a junction”, with some countries putting much greater emphasis on traditional testing of subject knowledge. The same expert also mentioned “interesting tensions” in the way PISA results are being interpreted in different countries. In this respect, it needs to be noted once more that there are variations between countries, and these are sometimes very marked.
- Literacy and numeracy take priority in high stakes exams and they are always assessed in traditional ways, mostly focusing on knowledge acquisition.
- The lack of a clear, transferable framework for assessing creativity, competencies, skills and knowledge all together in different subjects and disciplines is a barrier named by some.
- The idea that assessment needs to focus on individual students is seen as a barrier.
- The notion that competition and pressure increase productive learning is a barrier.
- Several interviewees noted that, given the opportunity, teachers would be willing to experiment and try new approaches, but assessment does not provide a climate for this willingness to flourish.
- From the beginning of secondary school teachers feel the pressure of having to teach towards the final exams. This is one of the biggest problems for creativity according to many of our respondents. The overall trend, noted by many experts, is that national examination systems make both students and teachers risk averse, and lead teaching and learning to focus on exam content.
- There are also issues in countries where teachers are not involved in the final, high stakes evaluation of their students. Removing teachers from the picture inevitably leads to standardised, highly formalised procedures that by their very nature struggle to take into account pupils’ creative performances.

3.4.1 New paradigms in assessment

- As noted by one of the interviewees, traditional assessment tends to encourage convergent thinking, in most cases rewarding the pupil’s identification of a single solution or correct answer. Creative teaching, on the other hand, encourages divergent thinking.
- As one interviewee put it “do you attempt to assess key competencies using and stretching the traditional system you already have, or do you start talking about a new assessment paradigm, which shifts the locus of control from the teacher to the learner, perhaps supported by digital technology, which would allow young people to capture and share their performances?”
- As one interviewee noted, traditional grading systems tend to take the creative thrust away even from the supposedly creative subjects like music, as students rarely create new content but only reproduce existing content.
- This new paradigm also means finding ways of assessing the creativity of teachers, and rewarding the more innovative practices.

- A new paradigm is also needed to address the confusion about the relationship between content knowledge and creativity, which is crucial in the assessment debate. One of our experts urged us to keep in mind the complexity of assessment, and the fact that it serves many different purposes. It is not 'a black and white' situation, and there is a rationale for traditional summative assessment of knowledge.
- Frequent testing via homework, oral work or written examinations are seen as barriers.
- Many educators' sense of how to recognise creativity is underdeveloped. They tend to latch onto concrete things during assessments, and to ignore processes or divergence and critique.
- Habits of mind formed during teachers' and parents' own schooling, possibly 20-30 years ago, are seen to dominate in the area of assessment, forming the single most mentioned barrier in this area. The thinking goes – marks and grades are necessary in order to measure pupils' progress. In order to award these marks and grades, regular tests must be administered. These tests generally have closed questions testing factual recall, in order to facilitate quicker marking.

3.5 Teacher Training and Continual Professional Development

- In many of the countries in the EU27, the content of the ITT curriculum is too full to allow for much space to innovate and discuss creativity or even innovations related to ICT and digital technologies more specifically. This was named as being the case far more in secondary training courses than on primary training courses, although for some of the primary education degrees, trainee teachers are required to master a wide range of subjects in order to teach, and this can contribute to the squeezing out of time for creative approaches.
- Outdated and outmoded teacher training curricula, and conservative and traditionalist academics were seen as a barrier to improving innovative methods in teacher training – particularly the hierarchical and disciplinarian view of the student-teacher relationship can become entrenched at this stage. This was said to be the case in, for instance, Cyprus, Austria, Hungary and Bulgaria.
- The lack of 'evidence' about the effectiveness of Creativity and Innovation in delivering traditional assessment outcomes makes many new and trainee teachers scared to attempt such approaches. This is clearly a barrier, though it is the mindset about what counts as evidence that needs to be changed.
- In many countries the stage of teacher training was named as being crucial to blocking innovation, in that traditional and rigid pedagogic and assessment regimes are passed on to new teachers by the methods used to train them, limiting creative potential.
- In several countries, the separation of practical and theoretical aspects of the ITT curriculum, with an emphasis on educational theory or history in a vacuum, with scant attention paid to practical encounters with children in real environments, was seen to be damaging to the quality and potential of the teachers produced by the system.

- An emphasis on subject-knowledge rather than on pedagogic approaches during ITT courses was seen as a complex and problematic barrier to classroom innovation.
- In other countries – particularly where one-year post graduate certificates are the norm - the amount of time spent by trainees in the classroom was viewed as squeezing out time for theoretical and reflective explorations of innovative methods or the meaning and point of creativity.
- A lack of relevant and challenging in-service training was named as a barrier by a number of experts across categories.
- In most of the EU27, experts asserted that the professional development offer is not sustained and strategically targeted to give teachers the confidence to transform their teaching environment. In some cases there are too many bits of training going on currently with no common thread. In other countries the continual professional development is provided erratically by private organisations and is not compulsory so many teachers miss out.
- Lack of funding and lack of time is a barrier to innovation -since the lack of budget for bringing in outside cover means that there is a difficulty of releasing teachers from lessons to go for CPD. It also means that students who are trying to be creative are prevented and 'moved on' to other things.
- In one country, it was said that in-service training for teachers being provided to support the introduction of reforms had been resisted by the teaching unions.
- One of the experts reported that teacher development programmes had been cut back due to economic circumstances.
- A number of experts said that ICT skills were not adequately covered in initial teacher training courses, particularly developments which could enhance creativity and teaching and learning.

Conclusions

This report brings together the main findings from interviews with 80 educational stakeholders from government, policy, research, the inspectorate, academia and teacher training in order to understand expert perspectives on the enablers and barriers to creativity and innovation in compulsory education in the EU Member States.

First of all, it is clear that the experts we interviewed placed great importance on creativity and innovation, particularly in order to equip young people with the flexibility and knowledge they need in what some saw as a continuation of the knowledge society. Moreover, there was an acceptance amongst many of them that there needed to be a cultural shift in education if creativity and innovation were to be given the emphasis that they believed was required. For instance, the interviews showed that, at policy level, creativity and innovation were frequently espoused and promoted in curricula, and many small pockets of good practice were enacted by teachers, in schools and in teacher training colleges. Nevertheless, gaps were perceived between the rhetorics in such documents and the realities in schools. These practices need to be made more widespread and systematic, and given sustained governmental support if this agenda is to be promoted and to become embedded within formal education.

One of the key findings of this project is that teachers hold a key role in promoting, encouraging and nurturing creativity and innovation in classrooms. However, the extent to which they can fulfil this role is often limited by systemic and institutional policies and factors. In order to teach in an innovative manner and to encourage creativity, teachers need to be supported at every stage. They need to have the time to help their students develop the thoughtful, critical and reflective processes that are essential to creativity. At present, the overall story that emerged from educational experts in many of the countries is one of content-heavy and overloaded curricula, restrictive and constraining assessment regimes which focus on 'teaching to the test' and meeting targets, a lack of systematic and widespread continual professional development, under-resourced classrooms in terms of textbooks or digital technologies, and teachers who are not adequately valued in terms of good salaries and structured career progression. Although academics and teacher trainers have emphasised in interviews that they are keen to promote creativity and innovation in initial teacher training courses, they acknowledge that it can be difficult for beginner teachers to maintain these good intentions as they become enculturated into a particular school system and are required to adjust to its established values and commitments.

This then is the challenge for creativity and innovation in Europe. Policy makers need to think about how the good intentions espoused in creativity-oriented curricula can be systematically supported in practice if this agenda is to be more successfully pursued. Older and less innovative curricula need to be updated. All aspects of the education system need to be prepared to take on board not just superficial but more fundamental critiques of current practice. The first part of this report which details the enablers to creativity and innovation as reported by educational stakeholders is a good place to start assessing how this could happen.

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Appendix 1: List of educational stakeholders interviewed

Table 1

Country	Academic	Inspector / Policy	Teacher Trainer
Austria	✓	✓	✓
Bulgaria	✓	✓	✓
Cyprus	✓	✓	✓
Czech Republic	✓	✓	✓
Denmark	✓	✓	✓
Estonia	✓	✓	✓
Finland	✓	✓	✓
France	✓	✓	✓
Germany	See table 2 below		
Greece	✓	✓	✓
Hungary	✓	✓	✓
Irish Republic	✓	✓	✓
Italy	✓	✓	x
Latvia	✓	✓	✓
Lithuania	✓	✓	✓
Luxembourg	✓	✓	x
Malta	✓	x	✓
Netherlands	✓	x	✓
Poland	✓	x	✓
Portugal	✓	✓	✓
Romania	✓	✓	✓
Slovakia	✓	✓	✓
Slovenia	✓	x	x
Spain	See table 2 below		
Sweden	✓	✓	✓
United Kingdom	See table 2 below		
EU	See table 2 below		

Table 2⁹

Country	Regions / EU				
Belgium		French region: ✓	German region: ✓	Flemish region: ✓	
Germany	General: ✓	Saxony: x	Nordrhine-Westphalia: ✓	Bavaria: ✓	
Spain	Overview: ✓	Andalucía: ✓	Extremadura: x	Madrid: ✓	
UK	Overview: ✓	England: ✓	Northern Ireland: ✓	Scotland: ✓	Wales: ✓
EU	Overview: ✓	Overview: ✓	Overview: ✓	Overview: ✓	

⁹ For Member States presenting a regional difference, Belgium, Germany and Spain and the UK, regional differences were covered as in table 2 above. In addition, four European wide interviews were carried out.

Appendix 2: List of educational stakeholders interviewed who asked to be named

Table 3

Country	
Austria	Andreas Ulovec, Alfred Fischl, Michael Schratz
Belgium	See below
Bulgaria	Eliza Stefanova, Sylvia Kantcheva, Jenny Sendova
Cyprus	Leonidas Kyriakides, Kyriakos Telemachou, Panayotis Angelides
Czech Republic	Jaroslav Faltyn, Jiri Filip, Martin Skutil
Denmark	Jens Rasmussen, Leo Hojsholt-Poulsen, Katja Munch Thorsen
Estonia	Piret Luik, Epp Rebane, Inge Timostsuk
Finland	Liisa Ilomaki, Leo Pakhin, Reijo Aholainen
France	Roger Raynal, Roger-Francois Gathier
Germany	See below
Greece	
Hungary	Marta Hunya, Judit Lannert, Istvan Bodoczsky
Irish Republic	John Halbert
Italy	Massimo Faggioli
Latvia	Ieva Rocena, Jolenta Klišane,
Lithuania	Asta Buinevičiūtė
Luxembourg	Victor Jovanovic
Malta	Philip Bonanno
Netherlands	Keimpe de Heer
Poland	Edward Nęcka
Portugal	MJ Conde, Roberto Carneiro, Ivete Azevedo
Romania	
Slovakia	Viera Blahova, Magdalena Polyakova, Zdenka Gadusova
Slovenia	Natalija Komljanj
Spain	See below
Sweden	Ulla Lindquist
United Kingdom	See below
EU	See below

Table 4¹⁰

Country	Regions / EU
Belgium	Marianne Poumay, Corina Senster, Chris Van Woensel
Germany	Thomas Hochleiter
Spain	Petra Pérez Alonso-Geta, Juan de Pablos Pons
United Kingdom	David Parker, Anna Craft, John Anderson, Jackie Gapper
EU	Maruja Gutierrez-Diaz, Graham HC Donaldson, Tapio Saavala, Anne Looney

¹⁰ For Member States presenting a regional difference, Belgium, Germany and Spain and the UK, regional differences were covered as in table 4 above. In addition, four European-wide interviews were carried out.

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Technical Note

Abstract

This report is part of the ICEAC study on Creativity and Innovation in Education and Training in the EU27. It presents enablers and barriers for creative learning and innovative teaching in compulsory schools in the EU27. It is based on 80 interviews with educational stakeholders from all Member States, from Ministries of Education, academia, teacher training institutions, inspectorate boards, and curriculum development agencies.

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