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classroom

Internal Deliverable 5.8

National perspectives of the potential of iTEC to influence policy and wide-scale practice: Summary

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September 2013

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NATIONAL PERSPECTIVES OF THE IMPACT OF ITEC ON POLICY AND PRACTICE: SUMMARY

Introduction

As outlined in D11.5.2, The Exploitation Plan, in the third year of iTEC the evaluation work under WP5 has been refocused to provide more evidence for exploitation and up-scaling. Previous cycles have focused on classroom impact, and over the three cycles good evidence for the positive impact of iTEC Learning Activities has been gathered. In year three more attention is being paid to communicating this evidence to Partners, Associate Partners and wider stakeholders to ensure that the value and potential of iTEC is made high profile.

To support this change of focus, a series of national case studies were undertaken, by WP5 and WP11 working jointly, with a view to informing exploitation planning, in addition to gathering evaluation evidence. The case studies present national perspectives and are intended: to capture perceptions of change/innovation enabled through iTEC; to capture and evaluate how iTEC has supported ICT policy and development at national, regional and local levels; and to identify enablers and barriers in relation to scaling-up iTEC outcomes at national, regional and local levels.

Each national case study took the form of a report based on a short survey and one or more online interviews with NPCs, MoE representatives and other key stakeholders (approximately 3 interviewees per country were involved). These were conducted and written up by interviewers from WP5 and WP11 between June and September 2013.

This report, which summarises the responses from the 16 country level reports, is divided into three sections. The first describes interviewees' perceptions of innovation in schools and the role of iTEC processes and outputs in this. The second section reflects on the impact of iTEC on ICT policy, strategy and related activities to date. Finally, the third section considers the future impact on policy and practice, including potential barriers to upscaling and interviewees' reactions to recommendations made by the iTEC High Level Group (HLG). It should be noted that this report presents an analysis of the evidence gathered through this exercise, but does not attempt to interpret or provide extensive commentary on the points raised (please see D11.5.3 for further contextualisation and commentary on this data).

Key findings

Innovation and change

- The focus on pedagogy within iTEC, and the corresponding pedagogically-led changes supported by technology, are the most innovative features of the project for most. Examples include the changing role of teachers and students

including students as independent learners both individually and in groups, and opportunities for teacher collaboration.

- Technological change has varied from teacher to teacher, and from country to country, including using existing technologies to change pedagogical practices, the adoption of new technologies and the increased use of technology in the classroom.
- The iTEC Learning Activities, Learning Stories and Scenarios are seen as innovative and important in facilitating pedagogical and technological change.
- The scenario development process is perceived to be one of the most innovative aspects of the iTEC project at this point, offering a professional approach to developing and documenting best practice and a methodology that supports change management in schools involving ICT. However it should be noted that at the time of this study the learning activity development process had not yet been made available to countries and therefore interviewees were unable to comment on this iTEC output.
- Although some iTEC tools (widget store, TeamUp and the iTEC Composer/SDE) may be useful in supporting change in the future, as yet they have not been sufficiently developed, or deployed at a large enough scale in the project, to have a clear impact.

Policy development

- While it is important for iTEC to make efforts to link with current and future policy developments, directly influencing policy is difficult to achieve given the numerous factors, stakeholders and approaches that are involved in policy making in each ministry. Fundamental issues also exist such as the timing of policy making and whether policy relating to education and particularly innovation and ICT exist at all.
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- Furthermore, the high degree of autonomy enjoyed by schools means a top-down approach may not be the most appropriate model for mainstreaming in many countries.
- However, without support at a ministerial level, it will be difficult to address perceptions that unreliable infrastructure and a highly prescribed curriculum are barriers to mainstreaming.

Future plans

- Support for teachers is crucial if iTEC is to be up-scaled and teachers with highly diverse skill levels and experiences are to be involved. Support required includes training and opportunities for collaboration to develop both digital and pedagogical skills. Clear documentation and multimedia/video resources would be beneficial.
- Engaging with teacher education providers is challenging particularly as universities and teacher training institutions operate with a great degree of autonomy in many countries.

- The self-review framework and teacher ambassador scheme are broadly supported in most countries (similar schemes have already been adopted in some), and the possibility of linking with similar schemes already in existence should be investigated.
- In a period when many countries are still in an economic downturn, the lack of sustainable funding is a concern, especially when considering how to take forward the HLG recommendations. However, some countries have ideas for sustaining iTEC through integration with ongoing projects and existing networks.
- Some countries have plans to disseminate iTEC approaches in the long term, but in others interviewees did not yet feel it is clear where responsibility for doing this lies.

Methodology

Interviews were conducted with stakeholders from 16 countries (AT, BE, CZ, EE, ES, FI, FR, HU, IS, IT, LT, NO, PT, SK, TR, UK); responsibility for conducting the interviews was split between WP5 and WP11. Where possible interviews were arranged as group discussions. Where it was not possible to schedule a time suitable for all the interviewees, individual interviews were conducted. Interviews were conducted online using Flashmeeting or Skype, or by telephone. A total of 37 individuals were interviewed.

The interview questions were devised jointly by WP5 and WP11. The majority of interviews were recorded (where this was not possible, notes were taken), but were not transcribed verbatim. The interview schedule was designed to be semi-structured, with interviewers being free to respond to interviewees' comments and to adjust questions or provide prompts as they saw fit. Summary reports were drafted by each of the interviewers using a common template. Some interviewers prepared one report per country, while others chose to prepare one report per interview if more than one had been conducted[1]. The quotes below are therefore taken from the national case study reports and are not direct quotations from the interviewees (unless indicated by speech marks). In total, 18 reports were analysed using Nvivo[2]. A deductive approach was taken, basing the coding on the themes of the report template. In this resulting report, lists of the countries in which a theme was mentioned during the interviews are provided to allow comparison and to indicate the relative frequency with which particular comments appear. However, as the interviews were semi-structured, the precise issues discussed in each interview varied and this needs to be taken into account when interpreting this data.

This summary report follows the structure of the template used for the national case study reports (change and innovation, impact to date and future plans), summarising responses under each heading and highlighting common themes between the 16 countries.

This report also draws on data from a pre-interview survey which was sent to all interviewees prior to the online interview. Twelve surveys were returned from interviewees in ten countries (BE, CZ, FI, FR, HU, IS, LT, NO, PT, UK).

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[1] Where the numbers of the times given themes appear is provided, the numbers of case studies (rather than reports) is given to avoid weighting in favour of those countries for which more than one report was produced.
[2] http://www.qsrinternational.com/products_nvivo.aspx

Perceptions of change/innovation enabled through iTEC

Change and innovation in schools

When interviewees were asked about change and innovation in schools, pedagogically-led changes were reported more extensively than changes in the use of technology. However, technology was clearly an underpinning enabler of pedagogical change and although the pedagogical changes referred to by interviewees could be facilitated without technology it is clear that it has played a central role. What these responses underline is the perception that iTEC resources enable pedagogically-led change in the classroom rather than technology-led change. As the following comments illustrate, it appeared that innovation in pedagogy, supported by technology, was the most innovative change for many countries:

> …realisation that the most important element is pedagogy, not devices (TR)

> The innovation in iTEC is that it gets teachers focussed from the start on rethinking their pedagogical approach and is not technology-led. (FI)

Pedagogical change and innovation

▪ **Role of students and teachers**

Changes in the roles of students and teachers were mentioned in nine countries (AT, CZ, ES, FI, IS, LT, PT, SK, TR). Teachers were described as becoming 'guides', while students become more active, taking greater responsibility for their own learning:

> The most innovative aspect is the changing role of pupils and teachers. In iTEC, the role of the teacher becomes that of a guide and pupils are more active throughout the lesson. Pupils are working in groups and occasionally taking on the role of teachers, creating their own learning materials to teach younger pupils. Students are also motivated to work on iTEC in their own time as well as during class, for example, writing blogs. (CZ)

> Students took greater responsibility for their own learning with teachers increasingly acting as guides, while students learned by themselves. (TR)

> iTEC has meant a change in the role of the teacher, from expert to facilitator. Many of the iTEC teachers had been used to standing at the front of the class, but now they see their role as interacting with the students. (IS)

> The roles of the teacher and learner have changed, with the learner taking on more responsibility for their own learning and the teacher a more supporting role, "answering

questions", with less of a directive role. It is believed that this approach is increasing the "sustainability of knowledge" of the learners. (AT)

The main benefit the iTEC materials bring is a change in roles of learners and teachers, with learners playing a more active role in the learning process. This is viewed as being a much needed modernisation. (SK)

Closely, linked to this, in three countries (BE, FR, NO) the focus on group work was seen as one of the most innovative aspects of iTEC:

Group work and collaboration are innovative pedagogical changes together with increased student autonomy. Teachers are more motivated to "organize group learning activities and adopt new approaches". (FR)

iTEC has helped them gain confidence and see the potential and attractiveness of group work.(BE)

In Norwegian schools teachers and pupils are quite used to collaborative activities and working in groups, however, iTEC has improved this collaborative activity with new approaches supported by a greater range of technologies (NO).

In one country, the change in the role of students from consumers to producers was also noted:

iTEC has enabled a shift in the role of learners towards being producers not just consumers, with this role they develop a range of essential skills relating to critical thinking, digital literacy etc., which are not developed when students are passively receiving information. The most radical aspect of this is the published of their products to a wider audience, increasing the importance of their work. (NO)

▪ **Collaboration among teachers**

Three countries (AT, FI, FR) identified greater collaboration between teachers as one of the most innovative aspects of iTEC; this involved not only sharing between teachers involved in iTEC, but also with those in other schools which were not involved:

iTEC Learning activities not only move teachers out of their comfort zone in terms of the way they teach and interact with students, but also encourage teachers to share what they are doing with others. They are said to be "no longer afraid of a third person seeing what is happening". Traditionally teachers remain isolated from each other and other stakeholders. (AT)

...the project enables teachers to experiment with different ways of managing learning where groups of teachers are involved and different schools are being linked and working together. (FI)

Another innovation is the development of a community of practice of teachers. Dissemination by teachers has taken place via a national blog and websites. There has been an increase in collaboration and interaction between teachers. "Even if what they do is not new the fact that they communicate a lot about it with their colleagues is new." There has been some increased use of technology by teachers not involved in iTEC who have been inspired by colleagues. (FR)

- ▪ **Professionalisation**

In two countries (FI, HU), iTEC was thought to lead to changes in the overall approach of teachers, what could be described as professionalisation:

The most radical change for Hungarian teachers is that they "can produce best practices in a more structured way" making "the process much more professional." (HU)

What makes iTEC "totally different from other projects", therefore, is the extent to which it requires teachers to reflect on how they plan and manage their teaching both with their own pupils and also when other schools are involved. (FI)

Technological change and innovation

In five countries (AT, BE, FR, IT, SK), interviewees discussed how the ways in which existing technologies were used had changed:

In iTEC the interactive whiteboards have been used more for learner interactions such as information sharing, gathering class/student feedback and contributions. The technology is being used much more by students during lessons, not just at the end to present results as might have been more common without iTEC. (AT)

The use of video per se in the classroom is not innovative but the way in which it was used in iTEC is (students creating videos to create tutorials for others). Students have made more use of multimedia materials than before and collected data through digital tools. (FR)

Teachers continued to use more or less the same technologies and to approximately the same extent as previously. However, there were changes in the ways in which teachers used technology, for example, using it for collaboration. (IT)

Furthermore, one interviewee commented that the value of iTEC was that it gave teachers ideas about *how* to implement new technologies, rather than simply providing a set of tools:

iTEC is useful because it focuses on how to do it and provides tools which can be used in the classroom. (IS)

In four countries (CZ, EE, FR, LT), there was reported use of new technologies and unfamiliar tools among teachers:

Teachers have also discovered new tools through iTEC and make more use of ICT than they might normally, for example, TeamUp was well-received. Googledocs, blogs and wikis were also well used. (CZ)

Implementing new technologies was one of the innovative aspects for many Estonia teachers, even those who are already familiar with the use of technology in the classroom. (EE)

Using more ICT was perceived to be innovative. For example, the use of log books (blogs) by pupils where they describe and reflect on their learning activities. (FR)

While in some countries, the use of technology in the classroom was felt to be "already commonplace" (LT), for some teachers, using any technology within the classroom was innovative:

In many schools the only ICT activity is in the iTEC class, usually students using ICT and digital tools and the teacher using an interactive whiteboard (PT).

There could also be wide variation within a country:

There are different types of schools in Israel; some are highly innovative. For these schools, "iTEC hasn't really changed their way of thinking" because they are already innovative. […] On the other hand, there are schools where the teachers stick to traditional methods. iTEC represented a dramatic change for these schools (IS).

The role of iTEC processes and outputs in facilitating the changes outlined

▪ **iTEC Scenarios**

The ways that existing iTEC Learning Scenarios help to facilitate change was discussed in eight countries (BE, EE, ES, HU, IS, IT, LT, UK). They were believed to provide an effective structure; were sufficiently innovative without being overwhelming; and were easy for teachers to use:

The iTEC scenarios and Learning Stories provide a good structure for teachers. The scenarios received a lot of attention in Estonia. (EE)

The iTEC Scenarios have opened teachers' minds and started them thinking outside the box to make changes to the teaching and learning process. It has changed their perceptions and forced teachers to think differently, which is valuable. (IS)

The library of iTEC Scenarios was welcomed. [The interviewee] noted that the resources would need to be translated and adapted as necessary to make sure that they are useful. (HU)

He is "quite impressed" by the library of iTEC scenarios that already exist and has particularly looked at those that make extensive use of different media. He likes the fact that they are not too high level or innovative as "this might scare teachers". (BE)

In addition, the process of scenario development[3] was identified as important in six countries (FI, FR, HU, LT, NO, PT), with two countries (BE, FR) singling out the Innovation Maturity Model as having an important role:

[The interviewee] singles out scenario development as being the most innovative part of the iTEC process which leads to teachers rethinking their practice and how they manage the students' learning. (FI)

Interviewee A suggested the scenario development process was the most innovative of the iTEC outputs because it helps "teachers to create new pedagogical situations using technology." Interviewee B felt that the use of trends in the process was innovative. Interviewee C noted that most teachers and ICT advisors had already been involved in similar scenario development processes prior to iTEC. However, what is innovative for Interviewee C is the involvement of a wider range of stakeholders in the process, particularly students. (FR)

The scenario development toolkit is seen as a real asset in Hungary…it is seen to facilitate a professional approach to developing and documenting best practice. (HU)

The Scenario development process is believed to have great value and will continue to have value and be useful for policy makers, school leaders and teachers. Involving teachers in the process has been a good experience for those teachers. It has proved to be an effective way of motivating teachers and as such has augmented their continuing professional development. (NO)

The scenario and learning activity development toolkits are perceived to be positive and useful, and the most innovative aspect of iTEC. (LT)

The most innovative and valuable part of the iTEC process is scenario development. [The interviewee] liked the use of trends and narratives (which give a useful picture and direction, showing how to move forward). (PT)

- ▪ **iTEC Learning Activities**

iTEC Learning Activities (and Stories) were identified as having a notable role in facilitating change at classroom level in eight countries (AT, CZ, ES, FI, IT, LT, PT, UK). The Learning Activities were thought to be valuable because they provided concrete examples of novel approaches; emphasised innovation and flexibility; and encouraged teachers to become learning designers:

The learning activities are valuable because they are very practical and show teachers how a lesson can be structured. The fact that they are concrete examples, rather than general descriptions is valuable. (CZ)

The Austrian National Coordinators and teachers have found the new ideas, encapsulated within the Learning Activities to be of greatest benefit in achieving their personal goals. The emphasis on innovation and flexibility (opportunities to experiment), have been most inspiring,

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[3] Most interviewees had seen a draft version of Eduvista, but had not had access to Edukata at the time of the interviews so were unable to comment on Learning Activity development as a process.

with new elements such as bringing in external experts as an example. The Learning Activities are seen as being easy to use by teachers, with the Scenarios having less direct value. (AT)

Creating learning activities enabled teachers to consider themselves learning designers, to vary the range of activities and to focus on what students (not the teacher) are doing. (UK)

- ▪ **Support and training**

In five countries (FR, HU, IS, SK, UK), the training and other support provided for teachers was seen as important in bringing about change:

The opportunity for teachers to participate in CPDLab workshops has been beneficial, particularly enabling teachers to find out about new technologies but also to exchange ideas with national and international colleagues. Networking with teachers from other countries has been innovative for French teachers. (FR)

Technical support and teacher training was innovative in the growing use of and confidence in webinars and the bank of recordings of them, and a move away from face-to-face workshops. (UK)

- ▪ **Collaboration**

Support for collaboration provided through iTEC was identified as an important component in bringing about change in four countries (AT, ES, IT, UK):

iTEC provides links to resources and an opportunity to network with teachers outside the UK. (UK)

The real innovation, in terms of systemic approach, is identified as the opportunity the iTEC process provides for building a community of teachers inspired to collaborate on the development of scenarios […] The engagement of all levels from learners through to teachers, school leaders and members of the ministry, in a collective effort to achieve innovation is a notable feature of the Austrian approach. (AT)

- ▪ **Focus on pedagogy**

In three countries (BE, FI, IT), a focus on pedagogy was mentioned as an important aspect of iTEC when it came to facilitating change:

…what is important/innovative is the fact that the Scenario development and the design of LAs precede […] and that teachers are encouraged first to reconsider their pedagogical approach. (FI)

iTEC is innovative because it is not focused on the use of a particular tool or device, but on issues such as sharing and collaboration; technology is just a tool which is use to facilitate these. (IT)

The concrete benefits [the interviewee] sees arising from iTEC is that it encourages schools to start with a pedagogical scenario rather than focus on technology. He believes that this could be the main reason why iTEC will be successful, "because it gives the teachers and the schools the ammunition to work with technology from a pedagogical perspective." (BE)

- **Project framework**

The introduction of a structured project framework was identified as another aspect of iTEC which had helped to bring about change in one interview:

The most important innovation is the introduction of a systemic project framework, with a more structured way of enabling innovative collaboration between learners and teachers. As an example of this BYOD has been an issue that has emerged with increasing interest during the iTEC project, and the project has provided an approach to test, with teachers and students, the issues and challenges. (NO)

- **Tools**

Although some iTEC tools (widget store, TeamUp and iTEC Composer/SDE) were mentioned by interviewees, it was generally thought that these outputs may be useful in supporting change in the future. As yet they were not thought to have been sufficiently developed or deployed at a large scale in the project and therefore had not had as much obvious impact as the other iTEC outputs and processes described:

He also thinks that the iTEC Composer could be something that is very innovative. (BE)

iTEC widgets and the use of the cloud could have potential in the UK. (UK)

The concept of integrating widgets within shells is welcomed. However, teachers have not been satisfied with the "iTEC widgets because our teachers can find more and better technologies outside iTEC". (LT)

The technical outputs of iTEC have suffered from technical issues in the early pilots. While the concepts of the widgets store, for example, is appreciated, the technical solution in its current form is limited by the number of widgets available and the need to integrate into a wider number of platforms. (NO)

How iTEC has supported policy development to date

Brief summary of activities to date

Activity	Countries
Seminars/workshops/forums	BE, CZ, ES, FI, FR, HU, IT, NO, TR
Conferences	CZ, FI, PT, NO, UK
Webinars/online meetings	CZ, IS
Media eg TV, newspapers	CZ, FI
Website	CZ, NO
Meetings	IS
Blog	FR
Facebook page	IS
Training materials	LT
Exhibitions	PT
Publicity materials eg magazine	BE
Thesis	NO

Figure 1: Types of activities conducted

Stakeholders	Countries
Teachers	BE, CZ, EE, FR, HU, IT, PT, TR
Teacher training schools	BE, ES, FI, SK
Ministry of education	CZ, FI, IS, PT
Regional authorities	CZ, FI, TR
Research centres	FI, LT, NO, PT
ICT Co-ordinators	FR
eTwinning ambassadors	CZ
Headteachers	CZ
Professional associations	UK
Commercial organisations	NO

Figure 2: Stakeholders involved

Impact on ICT strategy and policy development

A direct impact on strategy and policy development at this relatively early stage when iTEC results and outputs are incomplete was felt to be unrealistic by several interviewees. Furthermore, others argued that such an approach may not be feasible, or even desirable, given the devolved nature of education systems in many countries. Nevertheless a number of interviewees did identify opportunities to make connections between iTEC and planned policy developments in their respective countries.

Impact on national policy and strategy

In four countries (FI, HU, IT, LT), interviewees felt it was too early to expect iTEC to have had any impact on strategy or policy development, although it may do so in the future:

The iTEC project is viewed as a pilot and outputs may be identified for mainstreaming at a later stage (but it is too soon as yet) (HU)

In five countries (CZ, EE, FI, IS, TR), interviewees pointed out that directly influencing policy was challenging and that the remit of the organisations involved in iTEC means that they would be unlikely to be in a position to bring about change at a national level:

It is difficult to have a direct impact as DZS[4] is not a ministry, but rather an organization under a ministry and iTEC is only being piloted in a limited number of schools. (CZ)

At national level, more difficult to identify changes. There's a perception that changing policy maker/decision maker minds is more challenging. (TR)

In one case study, an interviewee expressed concern that the type of evidence gathered to evaluate iTEC would not be convincing to those in a position to influence policy:

…there are concerns that as the evidence is based on teacher beliefs it may not convince policy makers to the degree that experimental data might. Policy makers will inevitably require such data together with careful interpretation drawing out the implications for policy. As well as data from iTEC a systemic review of ICT and education would be beneficial. (LT)

Interviewees in a further four countries (BE, HU, SK, UK) argued that a top down approach for mainstreaming (with iTEC being introduced at a ministry level) was inappropriate for national models (or at least at this stage):

Discussions will take place within the Ministry in the final year of the project, but it is not necessarily felt that the long term value of iTEC will be gained through any national or top down intervention, as the Ministry is unlikely to operate in this way. Within the Slovakian Republic there are 8 regional governments, but direct intervention by these is also unlikely. (SK)

[The interviewee] suggests that the Ministry in Flanders has limited possibility to influence what each school does and that the three main groups of educational providers (for Catholic schools, community schools, and schools in municipalities/regions) may have the possibility to be more directive and influential. (BE)

In the UK the Department for Education (ministry of education) is not a partner in iTEC and levels of school autonomy are high. ICT policy is 'hands off' and devolved to schools; it is a school's responsibility, not government's. Therefore it cannot be said that iTEC has had any influence on national policy development to date. (UK)

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[4] DZS is an Associate Partner and not a MoE (or its nominated agency) acting as a partner in iTEC

Opportunities to link to existing policies / strategies

In one country, interviewees were able to point to evidence that iTEC has inspired practices at the country's national centre for education and ICT, having been mentioned in white papers:

The iTEC project has inspired the working practices of the centre, and it has been mentioned in several government white papers. (NO)

Furthermore, interviewees in five countries (AT, BE, EE, FI, FR) identified opportunities for iTEC to influence strategy and policy development in the future as there was a clear fit between iTEC and policy direction. In several cases, timing was clearly important as iTEC findings may be able to feed into key strategy documents:

…this is the right time for policy recommendations to be included in National Strategy of Education in Estonia. There is a chapter within this on 'digital culture in education'. The underlying ideas of iTEC appear to be very similar to those in National Strategy. (EE)

iTEC correlates quite well with other national developments, including the development of a new core curriculum, and the aim to digitalize the national matriculation exam in a few years. So, iTEC comes at a good time. (FI)

The focus for the Austrian Ministry of Education is to take action on youth unemployment, therefore the success of iTEC in supporting this policy objective will enable elements of the project to be scaled up. (AT)

…the main priority for the Ministry of Education is to ensure that schools in France enter the digital society and that technology use in schools increases. This includes increasing online education for students and providing online information services for teachers, particularly for primary school teachers. In addition there is a focus on encouraging teachers to collaborate with their peers and exchange information/resources. One approach currently under development is the use of social media to support the creation of an online professional community but this is at an early stage. The iTEC project reinforces this agenda and its activities. (FR)

[The interviewee's] aim before the June 2014 election in Belgium is to write a policy note for the next government which includes all the lessons learned from various innovation projects, including iTEC. iTEC results and recommendations on mainstreaming, therefore, are coming at a very good time in order to be included in this document. (BE)

However, this was not the case in all countries, as some do not have an ICT strategy for schools:

…there is no clearly defined ICT policy or strategy, no national plan for the integration of ICT in education, and the Ministry of Education's approach to curriculum development is 'back to basics' i.e. knowledge acquisition not skills development. (PT)

Other developments that have taken place as a result of iTEC

A wide range of other developments were mentioned by interviewees. While some are direct results of iTEC, others have a more tenuous link.

- **Consortium building**

  The consortium itself is an important output of iTEC. The members have developed a capacity to work together and this is an asset in its own right. This consortium has the capacity for follow up work and to apply for further grants. (EE)

- **Teacher training and support[5]**

  iTEC has helped Futurelab develop strategies and messages for schools related to forward thinking and planning and focusing on pedagogy-led innovation supported by technology. (UK)

- **Infrastructure to support innovation**

  As part of the new national strategy, learning and training centres[6] are being developed as new spaces with services for the whole educational community, including access to resources (paper and online), training programs, conferences, etc. Although iTEC has not influenced the LTC, it is a development in the same vein, since LTCs can potentially serve as places for teacher training (iTEC workshops and meetings), for testing iTEC technologies (computers and mobile devices will be available), and diffusing iTEC scenarios. (FR)

- **Impact on subject associations**

  iTEC has been represented at subject association events, notably Design and Technology and mathematics and [an interviewee] reports some impact of iTEC on ICT strategies in these subjects, via the associations. (UK)

- **Impact on commercial providers**

  iTEC has also impacted on Promethean's policies and strategies, not only in the UK but world-wide. The Promethean Planet iTEC community pages, in English, Spanish and Portuguese, are open to all 1.6 million registered educators who contribute to iTEC blogs and forums. Promethean's product development team are contributing to and following developments in the emerging iTEC technologies and momentum is building. (UK)

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[5] Future activities in this area are discussed under Future Plans below.

[6] http://www.netplaces.com/new-teacher/a-variety-of-teaching-methods/learning-centers.htm
http://www.schoollibrariesadvocacy.org.uk/toolkit/making_a_difference.pdf
http://www.jisc.ac.uk/uploaded_documents/JISClearningspaces.pdf

Future plans

How iTEC processes and outputs will impact on policy and practice

Interviewees discussed various ways in which more teachers might be encouraged to adopt iTEC approaches, including continued use of the resources and tools by iTEC teachers; in-service training; collaboration with other projects and initiatives; the provision of online information; and school advisors (Initial teacher training routes and teacher ambassadors are discussed below).

▪ **Continued use by iTEC teachers**

In five countries (CZ, EE, FR, IS, IT) interviewees commented that iTEC teachers were likely to continue to use the approaches they had been exposed to through iTEC, and possibly disseminate them among their colleagues:

Teachers involved in iTEC are using the same approaches with other classes, but often in a more limited, less time-consuming way. (CZ)

In July, a workshop is being held of teachers involved in cycle 4. This group has volunteered to take part to continue the work. They hope to start creating other scenarios and learning activities focusing on areas where they know improvements need to be made. (IS)

[An interviewee] felt that iTEC teachers would continue to use the scenarios and the new pedagogical practices after the completion of the project. Teachers involved in French pilots are very motivated[…]These teachers are likely to act as ambassadors and continue to disseminate the iTEC ideas to colleagues. (FR)

▪ **In-service training for teachers**

The provision of in-service training for teachers was mentioned as a possible method to impact on practice in eight countries (BE, FI, FR, HU, LT, SK, TR, UK). Interviewees suggested that training could be provided by a range of organisations including ministries, commercial providers and subject associations:

The plan is to create the videos/materials for the distance learning module by the end of 2013. The module will be included in a national platform for teacher training through distance education (M@gistère). (FR)

A group of heads has been set up in the Ministry to support iTEC development. One of the teachers has been working with the research and development centre to develop in-service training for teachers. (TR)

Localised resources and particularly any professional development courses could be given to other institutions involved in such training to increase the number of teachers who could be reached. Educatio would then hold a monitoring role. However this is just a possible option at the moment. (HU)

iTEC resources to support CPD would have to be directed through bodies like the National and regional Science Learning Centres...as well as mathematics support networks. (UK)

They will run a Future Classroom Scenarios course in Spring 2014 that is open to all Finnish schools and say this will be funded by FNBE as part of its annual programme of supported professional development courses. (FI)

- ▪ **Online information**

In five countries, interviewees described how online (and possibly printed) information could be used to help disseminate iTEC approaches (FR, HU, LT, PT, UK):

Formal processes to support the continuation of iTEC include publishing more information on the MoE website, the iTEC French blog and develop more case studies of scenario use for the national databases. Project updates may also be included in national newsletters for teachers. (FR)

The scenarios will be placed in resources databases. Guidance documentation will be prepared for teachers. (LT)

Dissemination will continue through events, workshops, conferences and through the Sulinet teachers' portal. There are also mailing lists and social networking sites and groups which will be used. Where possible dissemination will be via other projects... (HU)

After iTEC, Promethean will continue to promote the iTEC ideas but on the front page of the professional development part of Promethean Planet to be labelled Future Classroom. It will include a 'looking ahead' page comprising learning stories, activities, scenarios, and tools to help teachers build on them. Technological and pedagogical trends will regularly be updated with links to key news, studies, etc. on the topic. Promethean will continue to use the philosophy and terms in iTEC technologies, i.e. shell, composer and widgets... (UK)

In Portugal the Community of Practice is busy and should continue, the website is public-facing and there will be more activities, events and conferences. (PT)

- ▪ **Via other programmes and initiatives**

In four countries (AT, CZ, HU, IT), interviewees described how iTEC might link with related programmes or initiatives in order to have a greater impact on policy and practice:

As several ENIS Schools (www.enis.at) are involved in the iTEC Project, ENIS will distribute and motivate the other ENIS schools to test and try the iTEC scenarios in their educational process. It is planned in October 2013 to introduce iTEC to all ICT inspectors within a meeting in Austria. (AT)

eTwinning is seen as the main dissemination route. (CZ)

iTEC reports are already influencing INDIRE activities and projects. The outcomes fit well with other projects at regional or national levels. (IT)

[An interviewee] noted that there is currently a major project ongoing in Hungary which Educatio and OFI are consortium members. Educatio has responsibility for ICT and OFI has responsibility for pedagogy. Many courses are being developed over the next 3-5 months around subject specialisms. There is a possibility that iTEC outputs could be incorporated into these courses. (HU)

- **School inspectors and advisers**

In two countries, school inspection was mentioned as a further channel through which iTEC could be promoted:

Drivers of such changes could include pedagogical inspectors and school managers. [The interviewee, a general inspector at the Ministry of Education] suggested that his organization would continue to promote technology and would probably make use of iTEC outputs in support of this. (FR)

It is planned in October 2013 to introduce iTEC to all ICT inspectors within a meeting in Austria. (AT)

- **National Centre for education and ICT**

In one country, the national centre for education and ICT is developing a process, based on iTEC, to pilot technology in schools.

The centre is currently planning to develop a process, based on iTEC, for piloting technology in schools, This is particularly focused on the element of national strategy dealing with ICT supported assessment and digital exams. It has proven to be an effective approach to identifying examples if ICT in practice that can be mainstreamed. The scenario development and design of Learning Activities will continue to be used as standard practice in the development of assessment pilots. (NO)

Another initiative mentioned was the development of a fully ICT enabled bus acting as a mobile ICT and science classroom (AT).

While in some cases, partners already involved in iTEC appeared keen to continue to promote the approach (eg AT, FR, HU, IT, LT, UK), in other countries (BE, EE, FI, PT, SK, TR), there was less certainty among interviewees as to who would be responsible for ensuring iTEC has an impact on policy and practice beyond the project end date:

The DGE Unit 'does not have a remit to scale pilots'. The role of the High Level Group is important because it should bring senior policy-makers and heads of agencies into play. (PT)

[The interviewee] does not know if Edubit will have a contract next year to carry on with the dissemination of iTEC results. (BE)

The last few years have seen a great deal of upheaval in national level support for ICT in Estonian schools (EE)

The Ministerial iTEC working group will be abolished when iTEC project ends, which is an issue in terms of continued upscaling and mainstreaming. (TR)

Barriers to up-scaling and how these might be overcome

When interviewees were asked to identify possible barriers to up-scaling, most responded by discussing barriers to ICT-supported innovation in general, rather than issues facing the up-scaling of iTEC specifically. A wide range of potential barriers were identified[7]. The most frequently mentioned are described below.

Teacher-related barriers

- **Digital competence**

Teachers' lack of confidence, and competence, in using ICT within all aspects of their teaching, alongside a lack of appropriate training, was mentioned by nine interviewees (CZ, EE, FI, HU, IS, LT, NO, PT, SK):

The main barrier is teacher's "competence to involve ICT in every day learning in different subjects". Teachers are still not used to using ICT in classroom on everyday basis. (CZ)

Nevertheless, two big challenges are teachers' confidence in their pedagogical use of ICT in class and lack of sufficient support and training for teachers. (FI)

Teaching is very traditional and technology is generally not particularly well used. (SK)

- **New roles for teachers**

Teachers faced pedagogical, as well as technological, challenges. Interviewees in three countries (BE, CZ, UK) felt that the fact that teachers were being asked to take on new roles (as learning designers or group facilitators) would be a challenge:

The fact that teachers are typically "consumers of education manuals" and not producers or learning activities themselves. (BE)

UK teachers are not familiar with the concept of teachers as learning designers but designing learning pedagogies is critical in good mathematics teaching and early reading. (UK)

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[7] Interviewees' ratings of potential barriers in the pre-interview questionnaire are provided in Appendix A.

Teachers are not used to such extensive use of student teamwork and some are unsure how to best support this. (CZ)

- **Support required**

A lack of skills (both technical and pedagogical) among teachers, and the introduction of new roles means that comprehensive support is required if large numbers of teachers are to implement iTEC successfully. A lack of support and training was the most highly ranked barrier in the pre-interview exercise and providing this level of support was mentioned as a barrier by interviewees in four countries (CZ, FR, HU, IS, NO):

Another potential barrier is the complexity of the project. "If you have to explain too much … the more you have to explain the harder it will be to bring it to teachers or to any stakeholders of education." (HU)

Teachers need to have support – not only technical support, but also pedagogical. (CZ)

Of course, one way to overcome the lack of digital and pedagogical skills among teachers is via training (both pre- and in-service). However, interviewees suggested that case studies, sharing ideas and peer support among teachers were also important:

A good way to overcome this is to demonstrate best practice examples from other teachers who successfully implemented ICT in their teaching. (CZ)

The value of providing teachers with videos and case studies to help them meet the challenge of innovation should not be under-estimated. (UK)

- **Lack of time**

In three countries (BE, CZ, SK), time constraints were felt to be a barrier in the face of competing priorities:

There is a perceived reluctance of the majority of teachers in the Slovak Republic to invest time in producing new materials, (SK)

Everyone has time constraints and it is very difficult to find an occasion when you can bring together a school head, the ICT coordinators and a number of teachers. (BE)

One interviewee felt that this could be overcome by applying iTEC methods on a more limited scale:

For most teachers, iTEC was seen as placing significant demands on their time. Some have since taken the ideas of iTEC and applied them on a smaller scale which is less time consuming. (CZ)

National level barriers

- ▪ **Lack of ministerial/stakeholder involvement**

A lack of support at a national level was identified as a potential barrier in six countries (CZ, EE, IT, NO, SK, TR):

As the Czech Republic is an associate partner, they do not have the same degree of authority to introduce changes as a ministry. (CZ)

Lack of support at national level will make it difficult to engage schools, universities and other such as local government. This will significantly reduce the potential success of the mainstreaming strategy. (SK)

Teachers and schools are enthusiastic about iTEC and keen for it to continue, but more needs to be done to secure support at a policy or strategic level. (IT)

Some interviewees indicated that, in their country, a 'bottom up' approach was likely to have more chance of success:

Greater potential for longer term sustainable impact is through a bottom up approach, working with key teacher training universities, through commercial training, and with the support of influential teachers. (SK)

More generally, a lack of engagement with other stakeholders was identified as a major challenge in four countries (BE, ES, TR, UK):

There is an important issue in aligning all stakeholders and building momentum across the system. (ES)

[An interviewee] suggest that, in terms of mainstreaming, one needs to be alert to the tensions that might arise with the ministry and the educational providers. For example, in some ways iTEC pedagogical scenarios could be seen as potentially competing with publishers as they are not that different from a handbook or a pedagogical tool that one would normally expect to come from a publisher (BE)

Convincing evidence of the impact of iTEC was one factor which it was thought might help to engage policymakers and other stakeholders:

Sound evidence of impact will also be required. If this evidence is forthcoming and iTEC has a 'successful finish' then up-scaling will happen. (LT)

In another case study, an interview stressed the importance of personal connections:

They are using the Cycles 1-3 evaluation summary document, but a personal approach is very important in convincing policymakers. (IS)

▪ **Poor infrastructure and lack of resources**

In six countries (EE, ES, FR, HU, LT, PT), the absence of reliable technology was identified as a fundamental problem which was difficult to overcome. This did not simply relate to infrastructure available in schools, but also to which technologies students were able to access at home ("equity and access issues" (PT)). Possible solutions offered were exploring further funding opportunities and the use of BYOD:

In case of widget technology the main barrier is the lack of VLEs in schools[…]In some cases lack of insufficient technical infrastructure is a barrier as well. There are continual efforts to overcome this problem, schools can apply for equipment in European Union funded projects. (HU)

Some schools lack basic equipment to support some aspects of iTEC, for example, some did not have webcams to use with TeamUp. Here too, the development of BYOD may help. (EE)

BYOD has also been trialled leading to discussions at the school level (discussions are also taking place at the regional and national level, see for example http://eduscol.education.fr/ecogest/ticedu) concerning digital divide and security issues. The teacher piloting this approach developed a charter for staff, parents and students to sign agreeing to use the devices for pedagogical purposes only. This has now been adopted by other teachers in the school and will be transferred to other schools involved in research projects with CNDP. (FR)

In discussion, the important point of the reliability of technology was mentioned as an important element. It isn't enough simply to have some access, but access is required to be sustained 24/7/365. (ES)

▪ **A prescriptive curriculum**

Interviewees in five countries (ES, IS, LT, NO, TR) identified the current curriculum in their country as a barrier and some described ways in which this might be overcome although this would involve changing the culture of education:

Inflexibility of the curriculum and assessment – to overcome this barrier, first policy makers need to understand that testing is important…but it can't be the dominant culture of education (IS)

The main barrier is domination of curriculum-centred learning approaches instead of learner-centred approaches resulting in lack of tools and training for personalisation of learning, and lack of 1:1 initiatives and pedagogies developed. How to overcome: implementing scientific research on intelligent tools e.g. Web 3.0, artificial intelligence approaches etc. to personalise learning, development of curriculum and pedagogical scenarios using those intelligent tools, and large-scale teacher training following by creating more flexible learning spaces at schools and optimising the flexible / personalised timetables. (LT)

Traditional assessment continues to drive education systems and learning, and tends to inhibit adoption and development of innovative practice (ES)

Many teachers do not see the need to use blogs, social media, and to transform students from digital consumers to digital producers. This might be explained by an inflexible curriculum and assessment practices – the teachers do not really have to use ICT for new approaches and methods. So to transform our curriculum and assessment practices would be perhaps the most important answer to overcome the barriers. (NO)

Examination-focussed curricula were identified as the third most highly ranked barrier in the pre-interview exercise.

- **Lack of sustained funding**

A lack of further funding to support the development of iTEC beyond the funded project was mentioned as a challenge in two countries (FR, HU) and political and economic realities was the third most highly ranked barrier in the pre-interview exercise. It was suggested that integrating iTEC with other projects may be one way in which funding to continue the work could be secured:

Upscaling requires a lot of dissemination which needs financial resources. Producing professional development courses also requires funding. If additional funding is not available or integration with similar projects is not possible then the continuation of iTEC will be challenging. (HU)

To extend iTEC further funding would be beneficial in order to engage more teachers and develop more scenarios. This would enable CNDP to continue to run workshops, prepare scenarios in French, recruit teachers and support them. This could be partially addressed through integrating iTEC with other funded projects. (FR)

Other barriers less frequently mentioned included:

- Language

For the project, the iTEC materials were used in English as the teachers involved all had a reasonable level of English, however, these will need to be translated if iTEC is to be rolled out to more teachers. (CZ)

- Teacher rewards and recognition

Teachers are likely to require financial and professional recognition if iTEC is to be scaled up successfully.(EE)

- School policies

Also highlighted school policies during the interview as being particularly problematic in upper secondary schools – no mobile phone use, inflexible timetable, not open to project based learning. (FI)

- Limited range of scenarios

A potential barrier is limited number of scenarios and activities from which teachers can choose. The Spanish team consider it important to encourage more greater contribution of scenarios and activities to provide teachers with wider choice. It was suggested that a significantly larger number of scenarios contributed to by the community of teachers could efficiently and effectively fill that gap. (ES)

▪ Teachers ' attitudes towards collaboration

Another significant problem is that teachers in Israel do not tend to share; they are not used to discussing what they are doing and collaborating. Such attitudes take time to change and teachers need to become more comfortable doing this. A Facebook group has been set up to help teachers start to feel more comfortable collaborating, but more needs to be done to get teachers working together. (IS)

Therefore, conditions for up-scaling to ensure that iTEC can be fully exploited include:

- Teachers' pedagogical and digital competence (nine countries, ranked in top seven in pre-interview survey)
  - ➢ **could be facilitated through training and support**
- Ministerial/stakeholder engagement with exploitation plans for iTEC (nine countries)
  - ➢ **could be facilitated through greater engagement of High Level Group and European Schoolnet Steering Committee representatives (representing partner MoEs)**
- Access to reliable and sufficient infrastructure (six countries)
  - ➢ **could be facilitated through funding and/or bring your own device schemes**
- A flexible curriculum (five countries)
  - ➢ **in countries where the curriculum is prescriptive some teachers are still able to be creative and adopt new approaches within such constraints; sharing such exemplars may help to motivate others to consider changing their practice**
- Pedagogical and technical support for teachers (four countries, ranked in top seven in pre-interview survey) particularly in relation to the complexity of iTEC in its current form
  - ➢ **could be facilitated through online approaches to training and support (webinars, MOOCs) and providing further supporting guidance to accompany scenarios, Learning Stories, and Learning Activities**
- A positive attitude to prioritizing innovation (three countries, ranked in top seven in pre-interview survey)
  - ➢ **where teachers give priority to other demands on their time this could be addressed through supporting teachers to adopt iTEC on a smaller scale (perhaps for 1-2 lessons rather than 5-6 lessons for example)**
- A positive attitude to adopting new roles, for example teachers as designers or as facilitators of group work (three countries)

> ➤ **could be facilitated through training, support and guidance**
- Sufficient funding for mainstreaming innovation (two countries, ranked in top seven in pre-interview survey)
  > ➤ **could be addressed through integrating iTEC with current, ongoing projects**

Responses to HLG recommendations

Establishing a 'technology use maturity' self-review framework

Six countries (ES, FI, HU, IS, NO, UK) identified **existing frameworks** of a similar nature to the iTEC self-review framework which were already being used by schools:

> *Hungary already has a version of a self-review framework, based on the Becta framework. (HU)*

> *…many are already using [frameworks] for example NAACE's ICT Mark and Self-Review Framework, and Microsoft's Partners in Learning toolkit, as well as Promethean's own Educational Transformation Framework. (UK)*

> *Norway has established a self-review framework for school leaders similar to the framework used in the UK. Another one has been developed for teachers. (NO)*

> *There is already a framework of reflection and review so the self-review framework would fit in. (IS)*

The fact that a number of frameworks were already in use was potentially problematic according to interviewees in two countries (HU, UK):

> *There is a risk of confusion in schools if they are confronted with competing scenario planning tools and similar but different maturity models. (UK)*

> *As 1000 schools (of 6000 schools in Hungary) are already using this tool, a European version would not be of interest unless it offered significant advantages over the current framework. (HU)*

On the other hand, it might prove difficult to engage teachers in such a framework without a pre-existing foundation for such an approach:

> *The self-review framework might only be effective with those individuals who are already familiar with iTEC and/or very motivated. (LT)*

In two countries (BE, PT), there were concerns about how the framework would fit into national education systems and the approaches taken by ministries:

> *One of the problems lies in that education in Portugal is 'very much centralised', and the Ministry of Education dictates what schools should do. A matrix only works if schools are autonomous and have a degree of control over their destiny. They need to have four-year plans but there is no funding either for support or development. Therefore the matrix might raise*

expectations that cannot be met. Furthermore something sent from the ministry might encounter resistance. (PT)

…there are some senior people in the Ministry who are not fond of this sort of benchmarking approach. Even if it is used in ITEC as a tool for how schools can reflect on their own level on maturity re. the use of ICT, there is the fear that self-review frameworks could be a first step towards formally ranking schools. (BE)

Intervening in initial teacher training

In four countries (BE, ES, FR, IS), interviewees outlined work which was **already in progress** to integrate iTEC into initial teacher training. At the time of the interviews, this appeared to be at a planning/discussion stage:

[The interviewee] has been visiting a number of teacher training institutes and is beginning to see requests coming from them that they would like to know more about iTEC and integrate some of the results from the project in their curriculum. (BE)

The National Coordinator has already begun discussion with one university with the intention of embedding iTEC practices and methodologies in the practice of initial teacher training. (ES)

A teacher training college has a shown an interest in iTEC and are looking at ways to take it forward. This may result in iTEC being part of a teacher training course. (IS)

Others referred to **plans to contact** initial teacher training organisations in the future (FI, LT, SK):

… the three main teacher training universities in The Slovak Republic will be approached to adopt iTEC outputs. (SK)

CITE are already planning to work with teacher training institutions as part of the dissemination strategy. (LT)

…it may be possible to promote iTEC via the 12 teacher training schools in Finland. (FI)

Two interviewees commented on the way in which this linked to national developments:

The 2012 Ofsted Initial Teacher Training inspection framework expects excellent use of ICT to be developed, and this could act as a powerful lever for the development of teacher training provision. (UK)

… a national test for digital competence is planned, and which should promote greater interest in this area. (NO)

The majority of problems mentioned in relation to intervening in teacher training stemmed from the fact that those in a position to directly influence teacher training

are not currently involved in iTEC and persuading providers to change their courses was likely to prove challenging (BE, CZ, FI, HU, LT, PT, TR UK):

> *The task of convincing universities to take this up would be challenging […]"You need to do some unofficial networking with people to convince them to incorporate a course into a programme." (HU)*

> *However, developing such a relationship will be challenging because the universities are autonomous and conservative in their approaches to teacher education. (LT)*

> *As for intervention in initial teacher education, in Portugal it is provided by universities it is they who devise and deliver the courses. There is no ministry intrusion or interference; indeed it cannot even enquire about what is happening. (PT)*

> *…much initial teacher education is school-based, so it is hard to reach both tutors and students. (UK)*

> *It is difficult to intervene at the level of initial teacher training because of the independence of universities and teacher training institutions. (FI)*

> *Initial teacher training is conducted through universities. The universities do not include iTEC in their training and are likely to resist its inclusion, and hold strongly to their own autonomy. (TR)*

In three countries (AT, FI, UK), interviewees reflected that it would be more feasible to **influence schools** which have a direct role in teacher training, some of which are involved in iTEC:

> *iTEC schools in England that are Teaching Schools could play a key role in mainstreaming iTEC outputs, and there are two […], plus one School Direct Training School (UK)*

> *There is also a focus on working with the Department of the Pedagogical High Schools, of which there 12 in Austria. They play a direct role in teacher training and currently four have already been involved in the iTEC project and are positive about what has been achieved. (AT)*

Establishing a teacher ambassador programme

Regarding a teacher ambassador programme, seven countries (BE, CZ, FI, HU, PT, TR, UK) mentioned **similar schemes** which already exist, or will be launched in the near future (eg eTwinning, Promethean Advocates). Several interviewees (BE, HU, SK) suggested that iTEC might benefit from working with these networks, rather than setting up a separate scheme:

> *Turkey already has an ambassador style program planned, with organization due to be launched in the coming year (TR)*

> *eTwinning and Ingenious have them and it works well. (PT)*

Promethean have a team of 12 Advocates in the UK and already use some iTEC teachers who have Advanced Skills Teacher status…in this role for one day a week. (UK)

[The interviewee] suggested that an alternative approach might be to work with subject advisors (who will be appointed from September 2013) who are interested in ICT. They may be willing to disseminate some of the ideas from iTEC to the teachers they work with. (HU)

[The interviewee] has just set up a network of 34 Innovative Schools (a demonstration project) and one their roles is to act as ICT ambassadors. However, there may be some overlap between iTEC schools and those in this new network…The best case scenario would obviously be if some iTEC schools turned out to be part of this new network. (BE)

Interviewees in several countries (ES, FR, PT, SK) commented that teachers were **already fulfilling this role** to some extent or could easily be persuaded to do so (LT):

There are already full-time ICT advisors who are very dynamic and engaged; they have contributed to scenario development and dissemination (and could continue to do this as part of their role). Teacher ambassadors could work with the advisors to support this activity. (FR)

In effect, Spain has a number of examples of development of Ambassador teachers. In one case a teacher from Galicia was supported through training in cycle 1. (ES)

Currently, nothing of this nature exists officially, but there are some respected teachers who already take this role on voluntarily to some extent. These individuals have influence within the system through work with teacher education universities and involvement in national projects. (SK)

Funding (EE, FI, HU, IS); **incentives** for teachers (BE, EE); the precise nature of the **ambassador role** (BE, UK); and **identifying teachers** with the right skills (IS) were issues which interviewees thought needed to be resolved before the teacher ambassador idea was taken forward:

Teachers would be likely to ask for compensation and recognition in terms of enhanced status. To be effective in the long run, there needs to be more than just the involvement of naturally innovative teachers and this requires financial support and recognition or status within the profession. (EE)

Endorses the idea of iTEC ambassadors that are more than just evangelists; upscaling will also require certified iTEC coaches/trainers (BE)

Teacher ambassadors need to be peers, equals; it does not work to mix a good teacher with 'bad' ones – there is too much of a gap and the power relationship is wrong. Keep to 20% groups, e.g. bottom 20% to work with next to bottom 20% (UK)

[The interviewee] also believes that in-service training might be a good way to incentivise ambassadors as well as just a visit to the FCL [...] Also, the fact that schools are recognized as an example of good practice does a lot to incentivise schools in Flanders. The public recognition

that comes from presenting their work at a national conference can sometimes be reward enough rather than having a formal certificate. (BE)

So the Ambassadors idea is a good one, but there are relatively few teachers who have the skills to act as Ambassadors and funds need to be made available to support this initiative. One of the main problems is pinpointing those teachers who will be able to fulfil this role. (IS)

Conclusion

As the national case studies have illustrated, there is no single approach to upscaling iTEC and ensuring it plays a role in national, and local, ICT policy and development. Some of the iTEC partners feel they are not in a position to have a direct impact at a national level; in other cases, a top down approach is considered inappropriate. This is not surprising given the inherent complexity, and increasingly devolved nature, of education systems. Furthermore, in some countries, responsibility for the continuation and embedding of iTEC approaches beyond the project end date is felt to be uncertain.

There are clearly opportunities for iTEC to link into current, and developing, policies and strategies and in many countries, this is starting to happen, but doing so will require engagement with new stakeholders, not only ministries of education, but also teacher training organisations, publishers and other ICT projects.

The technology use maturity self-review framework was generally well-received, but the question of if, and how, this maps onto existing frameworks teachers are familiar with needs to be considered. Likewise, a teacher ambassador programme may benefit from working with similar networks which are already in place.

The development of teacher training (initial and in-service) is important as teachers' lack of digital skills, and also lack of experience in innovative pedagogies are notable barriers to upscaling. Other barriers include a lack of technological resources and examination-focussed curricula; these highlight the importance of engaging with policymakers to make efforts to overcome these fundamental problems which innovative teachers face.

APPENDIX A: BARRIERS IDENTIFIED IN PRE-INTERVIEW QUESTIONNAIRE

To what extent is each of the following likely to be a barrier to scaling up iTEC outcomes in schools in your country?

Type of barrier	Barrier	Range of ratings (1 = Not at all to 5 = Very likely)	Average rating
a) 'Pedagogical' inhibitors	i) Teachers' insufficient ICT skills (inc. pedagogical use of ICT in class)	2 - 4	3.1
	ii) Students' insufficient ICT skills	1 - 3	2.0
	iii) Lack of support and training for teachers	2 - 5	3.4
	iv) Inflexibility of the curriculum and assessment	1 - 5	3.0
b) Technical infrastructure in schools	i) Not enough	2 - 5	2.7
	ii) Out of date, unreliable	1 - 5	2.7
	iii) Slow bandwidth	1 - 5	2.6
	iv) Lack of connectedness (VLE accessible to all 24/7)	1 - 5	2.6
	v) Lack of technical support for teachers	2 - 4	3.1
	vi) School policies	1 - 5	3.1
c) Institutional / systemic barriers	i) Pressure of examinations	2 – 5	3.2
	ii) Timetabling	2 - 5	3.3
	iii) Constraints of space in school buildings and classrooms difficulties	1 - 5	2.7
	iv) School culture and negative attitudes from students, teachers and parents	1 – 4	2.4
	v) Political and economic realities	2 - 5	3.2

There was an evident lack of agreement among interviewees about the extent of barriers to upscaling. Overall, the barriers with the highest average rating (so perceived as the greatest problems on average) were:

- Lack of support and training for teachers (3.4)
- Timetabling (3.3)
- Political and economic realities (3.2)

- Pressure of examinations (3.2)

Other barriers identified were:

dominating of curriculum-centred learning approaches instead of learner-centred approaches (LI – rating 5)

lack of 1:1 classes (LI – rating 5)

lack of tools and training for personalisation of learning (LI – rating 5)

Current economic situation (PT - rating 4/5)

missing teacher skills on project pedagogy (HU - rating 4)

lack of a platform to build the new digital culture (IS - rating 4)

a decentralized structure where school owners (often municipalities), schools and individual teachers are able to decide and chose for themselves (FI – rating 3)

school leader's perception of usefulness of ICT in education (FI – rating 3)

The current "back to basics" approach advocated by the Ministry of Education and Science, with a clear emphasis on knowledge acquisition. No emphasis on the use of ICT in education. (PT - no rating given)