D2.3 - SUMMARY REPORT OF SCENARIO DEVELOPMENT PROCESS

This report is the submission of Deliverable D2.3 of the ITEC project as described in the Annex 1 – Description of Work (DoW).

The report describes D2.1 – T.4 for Cycles 4 – 5. It focuses on the evolution of the later cycles from the first three, specifically addressing areas of concern from the second review – predominantly the need for a focus on innovation within the scenarios. It discusses the rationale for Eduvista, a toolkit designed to support stakeholders create scenarios that are innovative in context – where context is identified by the Innovation Maturity Model. It also contains a summary of the scenarios and scenario development process in both cycles and a preliminary analysis of the toolkit and the resulting scenarios.

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1. Executive summary – key achievements

1.1 Summary of Cycle 4 and 5 activities

In these last two cycles the processes undertaken by Work Package 2 (WP2) have evolved. In Cycles 1 to 3 WP2 identified and analysed trends in pedagogy and technology, they became the building blocks in the collaborative workshops mediated by WP2 to develop innovative scenarios. The resulting scenarios were then reviewed by partners according to desirability and likelihood, with the highest scoring being refined before being sent to WP3. In contrast in Cycle 4 the first draft of the scenarios were written by Futurelab with input from WP2 partners rather than other stakeholders. They were based on: an analysis of the previously identified trends, innovative practice collated from iTEC partners, and suggestions from groups of learners elicited in workshops held in four countries. Subsequently, the scenarios were refined through a collaborative workshop involving teachers and pedagogical experts from beyond the iTEC project team. Finally they were reviewed by iTEC partners with respect to various dimensions, e.g., the level of innovation, the use of technology etc., and a report listing the key features and concerns was sent to WP3 alongside the scenarios. By using this multi-faceted feedback, it has been possible to interrogate, challenge and refine scenarios in ways that were not possible in the first few cycles.

In Cycle 5 there was a focus on “process innovation” in addition to innovation within scenarios. WP2 created a toolkit, Eduvista, to support scenario development, while in parallel WP3 created Edukata, a toolkit to support learning story and the underpinning activities development. Instead of selecting scenarios and being given a choice of learning activities based on these stakeholders are now able to develop scenarios and from them learning activities bespoke to their context which address trends that have greatest impact for them. The first draft of Eduvista was iteratively trialled in two workshops and revised on the basis of feedback from the attendees, namely, National Co-ordinators and iTEC partners. Once revised National Co-ordinators organized workshops across Europe using the toolkit to create scenarios that were relevant to their context and which could be perceived as innovative by the educational community. In addition, an expert workshop was held to design scenarios with a focus on emerging technologies and pedagogies to ensure development of “more radical” scenarios that could be trialled in small-scale pilots leading to transformative innovations in European schools (typically the quest of a FP research funded project).

1.2 Overview of key achievements

A significant focus of Cycles 4 and 5 has been the ongoing processing of feedback to improve and streamline the scenario development process. In line with the project method of cyclical, iterative development, both the scenario development process and the content of scenarios themselves have been fine-tuned to incorporate feedback and reflection from completed cycles, to better connect with progress in other work packages and to work towards sustainability of the project outcomes. In addition to improving how scenarios are developed – including the development of a new process as well as new tools in Cycle 5 - this reflection has helped understand the range of scenarios developed in the project, improved the understanding of ‘innovation’ within iTEC and in existing educational practice, and involved important stakeholders like teachers and learners more deeply in the process. This will ensure that their plans not only address the immediate concerns of the school accountability framework, but also are sufficiently innovative to address the future needs of the school, its learners.
and its stakeholders. Although both tools and process are in refinement based on feedback from Cycle 5 (which will be covered in Deliverable 2.4) the key achievements from Cycles 4 and 5, the role of stakeholders, the evaluation process, the Innovation Maturity Model, and finally the toolkit Eduvista, are summarised below.

1.2.1 Stakeholder involvement

This devolution of ownership was successful in terms of the numbers of scenarios created; in Cycles 4 and 5 stakeholders – particularly teachers – took a greater role in the scenario development process. This lead to meaningful ongoing engagement and the creation of scenarios that were relevant and engaging to teachers across the wider iTEC community.

In Cycle 4 44 teachers were involved in a face-to-face workshop held in January 2012 and 42 teachers were invited to join the online community formed after, 20 of whom responded positively. Six scenarios were created and supplemented by three generated through a collaboration with industry in June 2012 and one was taken forward from previous cycles. This cycle illustrated the supported provided by a teachers’ network and this approach to scenario development can be sustained throughout the project and beyond.

In Cycle 5 feedback was received from eight National Co-ordinators and two industry partners which showed 180 teachers, 21 teacher educators, 21 policy makers, 17 industry representatives and at least 41 others (academics, students, NGOs) were involved in workshops. Six of these National Co-ordinators and another two who had not completed the survey submitted 22 scenarios. 26 teachers participated in a workshop held as part of the CPDLab run by EUN which generated a further six scenarios. Finally eight experts (3 academics, 3 from industry, 1 educational consultant and 1 from a funding organisation) developed seven scenarios that were also reviewed.

1.2.2 The evaluation process

The evaluation process had been raised as issue in Cycle 3 and was changed in Cycle 4 to address the concern raised by reviewers and WP5 that the scenario ranking process – seeking consent from all iTEC partners and associated teachers - had led to scenarios which were already pedagogically and technologically feasible rather than innovative.

The evaluation process in Cycles 4 and 5 had been developed by considering six critical dimensions identified when refining the Pedagogical Board evaluation process (as described in Deliverable 2.2). These are:

1a. Is the scenario sufficiently innovative for the future classroom?
1b. Does the scenario add to the range of innovation provided through iTEC?
2. Does the scenario have the potential to support teacher competency acquisition?
3. Is the scenario innovative its potential use of technology?
4. Does the scenario address recognized focus areas for educational reform?
5. Is the scenario currently feasible and sufficiently scalability for potentially large scale impact?

Each was then subdivided into three explicit criteria, for example, in the first dimension the reviewers must consider: if it meets the challenge specified, if the benefits of innovation are expressed and is
there a novel assessment process. In addition to comments around how this area is fulfilled, or any concerns if not, it is then scored out of three depending on how many of the criteria was met (0 – none, to 3 – all). Each dimension was scored as to how well the scenario addressed it and comments on key innovations or concerns were requested to be specifically kept or addressed in the learning activities (for a full description see WP4 Deliverable 4.3 (Le Boniec, King, and Ellis, 2012)).

Within the Eduvista toolkit dimension 1b was removed and a further dimension was added if multiple scenarios had been created:

- Do the scenarios represent a range of innovations?

The evaluation process is optional in the toolkit, and the choice of who should assess and whether they should be limited to one or multiple dimensions is that of the stakeholder facilitating the process. The review can be used to refine the scenario directly or feed into Edukata.

In Cycles 4 and 5 a member of the Integration Committee took responsibility for assessing the scenarios against a given dimension. This was done through discussion with a minimum of three other project partners – allowing a representative opinion from across the consortium. In Cycle 4 the feedback was collated and given to WP3 who ensured key points were kept and concerns addressed in the learning story and activities development process. In Cycle 5 the feedback was for publication and the various National Co-ordinators to feed into the next stage.

Unlike previous review processes using the Pedagogic Board the feedback would reflect knowledge of iTEC and its goals or the starting context as well as allowing experts to be bought in with specific knowledge of proposed technologies and pedagogies.

1.2.3 The Innovation Maturity Model

The model (see Appendix A) first described in Deliverable 2.2 in Cycles 4 and 5 was shown to be of benefit to stakeholders to promote discussion and help identify elements for their scenario as well as allowing the assessment of innovation within a scenario.

Encouraging stakeholders to use the Innovation Maturity Model in Cycle 5 was key in stimulating scenario production. Those using the toolkit are required to assess their current level of innovation and develop or adapt a scenario that moves them forward, reassessing the scenario against the matrix at the end to ensure that the innovation is moving the classroom on in the following areas in education: outcomes (learning objectives), processes (pedagogy, learner role, management of teaching, learning & assessment) and resources (underpinning technology). The maturity model, although not a new concept (see Deliverable 2.2, Section 3.4), enabled stakeholders to identify whether a scenario is innovative given the current context, and whether this innovation is incremental – that is, uses tools or pedagogies in a new way building on previous behaviour, or radically innovative – where the scenario is cutting edge (even if not straight forward to implement).

There were a few minor changes to the text in order to prevent misinterpretation as it was reviewed by partners, but by its nature the model cannot be overly prescriptive given the wide range of possible scenarios and users. However, terminology does not always translate appropriately, for example, ‘enrich’ and ‘empower’ caused some discussion – this emphases the need to share an understanding of the model and how it is interpreted prior to its use.
1.2.4 Eduvista

The rationale for the development of Eduvista was twofold. Firstly, a process to bring about incremental but sustainable change has previously been missing in the education system, despite years of investment and research. At the level of individual schools school leaders need a framework for deciding on how to develop curriculum delivery and classroom design and practice, for example, when a school is considering investment in technology, or when a school is making changes to the curriculum or school layout. Alternatively an effective methodology for change management to ensure that key stakeholders are consulted and their support secured was needed. Looking at the regional and national level there is a need for countries to support policy change, particularly involving deployment of technology. In each case the fundamental principles of creating a shared and reliable vision of the future education situation is consistent – and this can be in the form of a shared scenario.

Secondly, there was a need for stakeholder ownership identified in the earlier cycles. Teachers had been selecting learning activities (based on the scenarios) which are easy to understand and fitted in with their curriculum. The suggestion was to increase the range of learning stories to provide greater choices (Cycle 3 Evaluation, Lewin et al, p13). In turn this would mean increasing the range of scenarios and by involving stakeholders this would ensure relevant scenarios that were sufficiently innovative to address the future needs of the school or region.

The toolkit, Eduvista, was not originally in the Description of Work (DoW) but was developed to provide a more efficient, and crucially, more sustainable process of scenario development that can be used in the various contexts described above. Eduvista allows participants to create scenarios from scratch; identifying trends, the current context – locally or nationally, the desired outcome and then creating a scenario structured according to a template. This requires the participants to state: which trends the scenario addresses, who is learning; where they are learning; why they are learning; what they are learning and what resources, tools and services are being used. Alternatively, the participants could identify trends, context and desired outcome then use a rich bank of source material, namely some of the existing 60 mini-scenarios, to adapt to their needs using the same template.

As required by the reviewers to ensure that the scenarios have more relevance the toolkit references areas of current research to review (e.g. cloud computing, analytics) and the research community (e.g., TEL research, OECD reports). In Cycle 5 it was agreed to create a toolkit to replace WP2 as mediators of workshops in order to provide a legacy to the project.

Finally, training courses incorporating this toolkit will also be developed as part of the dissemination process in order to ensure that stakeholders outside the project can replicate the iTEC scenario development process at national, local and community levels.
2. Introduction
This report is deliverable D2.3 of the iTEC project as described in the Annex 1 – Description of Work (DoW). It reports on tasks T2.1 – T2.4 for Cycles 4 and 5 (the former was not covered in Deliverable 2.2) as required in the DoW together with a summary of the scenarios and scenario development process in the third year of the project at month 36.

Deliverable 2.2 described development until the Mapping Tool (section 3.5, Cranmer et al 2012) and Innovation Maturity Model (section 3.4, Cranmer et al 2012). The latter was refined over the course of the toolkit development and these will be discussed in Section 4.2.

Cycle 4 began in January 2012 (month 17) and was completed at the end of May 2012 (month 21). The development of Eduvista stared in October 2012 (month 26) and a first draft was reviewed in January 2013 (month 29). The toolkit itself was used between and July 2013 (month 35) and the scenario review process completed in September 2013 (month 37).

In the original DoW this deliverable should discuss the design (T.1), conducting (T.2) and analysis (T.4) of a second survey to over 1000 teachers and the use of an ordering tool for students to determine the attitude to the role and use of ICT as in Cycle 1. However, going forward, the project wanted to make more use of a teacher community as a dynamic way of engaging with teachers. This approach allows for more, ongoing teacher participation and improved quality of input in comparison to a survey. It should also be noted that this approach is part of a wider project strategy to commit sufficient resource and focus on establishing and developing an active teacher community, with additional benefits across all WPs. A formal request was made and approved in May 2013 to remove the second survey and hence analysis.

Also, the second aspect of T 2.1 was to identify and appoint a ‘Pedagogical Board’, made up of MoE approved experts to act as reviewers for the scenarios alongside iTEC partners and teachers. However the 2011 Annual Review suggested cancelling the Pedagogical Board and increasing consultation across the consortium. This was formally submitted as a change request in May 2012. In its place an Integration Committee made up of iTEC partners was set up to fulfil the advisory aspect of the Pedagogical Board. With respect to the scenario review a new inclusive process was introduced. Instead of the Pedagogical Board members commenting on the scenario against specific criteria these were formalised into six specific areas – or dimensions - with a marking scheme which within the cycles were managed by the Integration Committee (see Section 3.1.2).

The remainder of this report therefore focuses on the development and description of the scenarios created and a discussion of the effectiveness of the final cycles.
3. Scenario development process

3.1 Changes between cycles

The work package’s view of Scenarios themselves have not changed during the course of iTEC. They can still be defined as short narrative descriptions of preferable learning contexts which facilitate more engaging classroom intended to inspire teachers. They are based on emerging trends found through an analysis of factors that influence schools. And the scenarios take account of different elements within the learning environment, for example, the resources available, tools and services, the interactions, the tasks and the aims (Cranmer and Ulicsak 2011).

To illustrate the change in process the structure of the first three cycles are summarised in Table 1 below:

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<td>Scenarios were based on extensive desk research and exploratory consultations – mainly with internal stakeholders. These activities helped to identify relevant socio-technical trends that were to underpin the narrative descriptions and the pedagogic activities thereby proposed.</td>
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<td>20 scenarios were developed, and then reviewed by the stakeholders and the 9 scenarios that were felt to be most desirable were selected. These were elaborated to drive the design of learning stories in WP3.</td>
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<td>Research to refine the socio-technical trends continued but greater emphasis was put on the consultation activities. Surveys, workshops and other activities to gather relevant input were carried out involving internal and external stakeholders. Again there was a review after the first workshop in order for stakeholders to assess scenarios against desirability and likelihood.</td>
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<td>16 scenarios were developed initially in Cycle 2, and 10 of these were selected to drive the design of learning stories in WP3.</td>
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<td>18 scenarios arose from the Cycle 3 workshops, with 7 being sent to WP3 after the review.</td>
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Table 1: Summary of Cycles 1 to 3

Whilst Cycle 3 benefited from additional input by teachers, it was agreed that more of a bottom up approach in Cycle 4 would give teachers more of a sense of ownership of the scenarios. Merging Cycles 4 and 5 was initiated to improve the timeframe meaning that Cycle 4 would be less rushed allowing more time to engage teachers and other key stakeholders. Also it was intended to allow for the building of an online teacher community and peer network that could be involved across the project through from the scenario development process in WP2 to the participatory design workshops and pre-piloting in WP3 and piloting in WP4. This would also require WP2, WP3 and WP4 to work together more closely which will widen their involvement in and understanding of the process and how to enhance the outputs. Moreover, the joined up process was felt to be suitable to enable the teachers involved to bring their experiences at the different stages of the project to influence the next stage of scenario development so that they will be instrumental in the iterative process. Increased integration
of iTEC technologies was again a means through which the project can become more joined up between technical and pedagogical work packages to ensure that the vision for iTEC is realised.

Over the course of these cycles in line with the project method of cyclical, iterative development the following requirements for the final cycles emerged from feedback from partners, reviewers and the natural evolution of iTEC’s mission and scope:

- Work more closely with teachers and integrate their participation in the scenario development process
- Better integrate the scenario development work with iTEC technologies and suppliers
- Connect with and integrate information and lessons learned from other existing EU projects
- Integrate more directly on teachers’ realities (this was a core theme of the trends and drivers identified in Cycle 2)
- Draw on other EU projects which generated sets of trends and drivers consistent with those identified in iTEC and consider examples of good practice including from other key EU projects including STELLAR and ITILT
- Revisit scenarios developed in previous cycles which for whatever reason were not among those taken forward for further development despite having several important qualities and reflecting important trends and drivers (in particular, those scenarios believed to be too radical in previous cycles).
- Draw on technological input from the specialist technology partners, based on targeted consultation activities partly based on technological trends and drivers identified in previous iTEC cycles

In addition, the feedback from the second year review reported that “the issue of what a “meaningful” scenario involves remains unclear” (Bélisle et al. 2012, p.6), and at this stage of the project the scenarios “developed remain unsurprising, and much of what is described is already taking place in some contexts across Europe” (ibid, p.6). This raises the issue around the scenario selection process, what is presented to WP3 to create learning stories. These two issues have been explicitly addressed in these cycles and the issue and how they have been described are next.

3.1.1 The need to establish what is meant by innovation within scenarios

What emerged from the review process was the need to clarify what is meant by relative and absolute levels of innovation within scenarios so that appropriate scenarios are developed and implemented. The description in Deliverable 2.2 has been extended, in the context of iTEC radical innovation has been defined by a number of characteristics:

- No evidence of the scenario currently in use in European Schools, other than in specific research projects
- Clear barriers to up-scaling resulting in very low probability of mainstreaming in the near future e.g. policy barriers (bring your own devices - BYOD), technical barriers such as limited technical infrastructure and current pedagogical constraints of curriculum and assessment

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2 For example, NEXT-TELL contributed a scenario in Cycle 5 which was not bought forward as was similar to that being developed as part of the project but was useful as a comparison for technology and pedagogy
• Making use of technologies rarely used in schools (e.g. very new technology, expensive technology, or technology not perceived to have a place in education)

• The theme of current TEL research e.g. cloud computing; mobile learning; 3D printing; augmented reality; Serious games and gamification; personalised learning; and virtual laboratories or remote labs.

These discussions contributed to the refinement of the Innovation Maturity Model which evolved in Cycle 4 and was used by stakeholders in Cycle 5. This is illustrated, for example, by the technology stream specifically mentioning 3D printing at level 4; and by agile responses to student needs through cloud and mobile computing in level 5.

This reflection has helped extend the range of scenarios developed in the project, improved the understanding of ‘innovation’ within iTEC and in existing educational practice, and through raising awareness involved important stakeholders like teachers and learners more deeply in the process. However, this is not to say that in earlier cycles there was no innovation. Within WP5 Manchester Metropolitan University has recognised ‘innovations’ within Learning Scenarios such as a shift in pedagogical practices from more instructional-focused activities to those broadly based within social-constructivist approaches. Shifts include increases in student-centred teaching practices, collaboration, knowledge building and problem solving activities, new roles for teachers and learners and shifts in assessment, involving increased formative, self- and peer-assessment, and an emphasis on authentic tasks. These can be seen as incremental innovations – they build upon existing practice.

3.1.2 The importance of a review of scenario potential rather than a selection process based on feasibility

WP5 have identified that more open scenarios and learning stories which can be adapted across a wide range of subject areas would be beneficial (Cycle 3 Evaluation Report, Lewin et al. 2013, p.13). This implies that the 1000 plus teachers who have been involved in the process have had difficulty applying the learning story or scenario in their classroom. Hence the selection of learning stories (based on the scenarios) which are easy to understand and fitted in with their curriculum. The suggestion was to increase the range of learning stories to provide greater choices (ibid p13). In turn this would mean increasing the range of scenarios, which in turn would mean revising the selection process.

In Cycles 1 to 3 the scenarios were given to stakeholders to assess according to desirability and likelihood. These were very broad categories scored numerically on desirability and by time in number of years for likelihood. There was space for comments but they were not obligatory and rarely used.

In Cycle 3 it had been proposed to extend the review criteria to specifically consider the following aspects of the scenario:

• A: Match identified trends and challenges
• B: Feasibility of pedagogical implementation
• C: Feasibility of technological implementation
• D: Innovative/transformational character
• E: Prospects of impacting at scale, if validated successfully
These areas were subdivided into specific criteria and points allocated according to the number of criteria fulfilled, as well as asking for comments (see Appendix 8 of Deliverable 2.2). This proposed template was revised for the Eduvista toolkit in conjunction with WP4 and WP5 into the following five dimensions when reviewing a single scenario.

- Is the scenario sufficiently innovative for the future classroom?
- Does the scenario have the potential to support teacher competency acquisition?
- Is the scenario innovative its potential use of technology?
- Does the scenario address recognized focus areas for educational reform?
- Is the scenario currently feasible and sufficiently scalability for potentially large scale impact?

Each was then subdivided into three explicit criteria, for example, in the first dimension the reviewers must consider: if it meets the challenge specified, if the benefits of innovation are expressed and is there a novel assessment process. In addition to comments around how this area is fulfilled, or any concerns if not, it is then scored out of three depending on how many of the criteria was met (0 – none, to 3 – all).

A further dimension was added if multiple scenarios had been created:

- Do the scenarios represent a range of innovations?

This ensures a range innovations in pedagogy and technology are represented (for a complete description of the areas see Le Boniec et al. 2012, pp.29-38).

Within Cycles 4 and 5 there was an additional dimension:

1.b Does the scenario add to the range of innovation provided through iTEC?

This was added to specifically ensure that there was not a focus on a single technology or pedagogy – which had been an issue in earlier cycles, for example, the emphasis on group work in Cycle 1. The range of innovations can be assessed using the Innovation Mapping Tool which is an optional activity within the Eduvista toolkit (see Section 3.5 in Deliverable 2.2 for a description). It also led to a revision of the scenario template which was amended slightly to ensure that it was easier to assess against these dimensions, for example, by explicitly listing the range of technologies and pedagogies (see Appendix B).
4. The Eduvista toolkit

4.1 Rationale for toolkit
In Cycles 1 to 3 scenarios had been created with the involvement of WP2. This led to a restricted number of scenarios, and hence learning stories with their activities, which had to be applied in multiple contexts. However, individual schools need a framework to decide how to respond to their circumstances, for example, when they are considering what technology to invest in, or building new classrooms, or determining how technologies, e.g. mobiles or cloud computing, will fit into their school. Similarly, at the national or regional level there is a need for countries to support policy change, particularly involving deployment of technology, which was not addressed by this process of mediated workshops – the stakeholders needed ownership of the process as well as selection process to tailor the scenarios.

In addition to the argument above, what emerged from Cycles 1 to 3 was:

- Through a properly supported process, knowledge of trends can form the basis of scenarios about preferred teaching and learning tasks, which can then in turn be used to develop learning stories to inspire teaching and learning activities.
- It is possible to identify a common set of developmental stages of innovation in the technology-enabled classroom to prompt more innovative thinking.
- The process of stepping back from day to day concerns to develop innovative scenarios is a powerful form of professional development, particularly if it brings together the diverse stakeholders who have interests in the future of learning.
- The tools developed within previous workshops to support this process are valued and could form the basis for a sustainable approach to maximising iTEC’s impact.

Internal discussions with iTEC partners and within the WP2 partners then generated a number of explicit expectations for Cycles 4 and 5 of scenario development, which were formalised as specific requirements:

- Integrate more directly on teachers’ realities (this was a core theme of the trends and drivers identified in cycle 2).
- Draw on other EU projects which generated sets of trends and drivers consistent with those identified in iTEC. For instance, one of such projects was STELLAR: a network of excellence in Technology Enhanced Learning in which several projects were based on socio-technical trends and drivers.
- Revisit scenarios developed in previous cycles which for whatever reason were not among those taken forward for further development despite having several important qualities and reflecting important trends and drivers.
- Draw on technological input from the specialist technology partners, based on targeted consultation activities partly based on technological trends and drivers identified in previous iTEC cycles. This has the potential to facilitate iTEC’s sustainability in the longer term given that suppliers will most likely continue to exist and advocate technologies in schools beyond the end of the project.
In the creation of Eduvista the first point was addressed by allowing teachers and other stakeholders to create scenarios that were bespoke for their realities. The remainder were done through explicit inclusion within the toolkit. Not only does it contain the trends identified in earlier cycles but also contains stimulus material related to the requirements, namely:

- It identifies and links to areas which could generate trends and drivers, e.g., cloud computing, games, learning analytics alongside organisations that identify trends, e.g., OECD and New Media Consortium, and links to organisations such as STELLAR and TEL that may provide trends and drivers through their research
- It includes selected previous scenarios which, with support, stakeholders can adapt to their own context
- It contains the results from students re their attitude to technology and techniques for gathering this data in the future

Many of the activities within the toolkit were adaptations of the existing process performed by WP2 prior to and within the mediated workshops, for example, the initial identification of trends, a review of emerging technologies, the Innovation Maturity Model, the completion of a template to ensure relevant areas etc. However, the toolkit contains new activities to support stakeholders' structure their trends and review the existing and identified descriptors and prioritise them against a number of factors (including likelihood, timescale, concerns and aims of education) that had been done by WP2.

Finally, the Eduvista toolkit encourages those creating scenarios to work with stakeholders not represented within the consortium, for example, teachers, suppliers, experts, policy makers, those in the local community or TEL researchers, to develop scenarios that address trends and issues that impact their schools at a local or national level. To achieve this it contains tools to suggest, identify and record possible relevant stakeholders and methods for collaboration. These tools are generic and can be used across the various EU member states. This is important as the need to take on board existing research was recognised (Bélisle et al. 2012).

4.2 Role of the Innovation Maturity Model

Within the iTEC project there was a concern that the scenarios proposed were not innovative, they had been reduced to the lowest common denominator of technology and pedagogy. An analysis of previous scenarios using the Innovation Maturity Model shows that while all of the scenario aspects were not at stage 1, few were clearly at the highest stages of innovation within the model. There was an incremental innovation assuming a low starting point. This clarifies the perceived “absence” of innovation which the reviewers have commented on in earlier cycles. To ensure that stakeholders, including ministries, can see the progression the Innovation Maturity Model makes it explicit. The model has three key functions, to:

- Serve as a basis for reflection allowing stakeholders to identify the level of innovation within their school or locality (as the local context determines what is required to make a scenario is innovative)
- Act as a stimulus to the production of more innovative scenarios as it inspires participants to think about what type of features would be innovative within the school context – that is, they are encouraged to think how to move "up" one level across the dimensions – so that the scenario is relatively innovative to the starting point. For example, in schools where blogs are regularly written by students and there are often cross curricula projects then a scenario
which presents information on a white board about a specific subject will not be “pushing the envelope”. This process should be iterative, if a created scenario is not at a higher level than the initial starting point in at least one dimension what needs to be adapted to make it such?

- Finally, as an organising framework for the scenarios, clearly identifying the stage of innovation where each scenario sits allowing stakeholders to select scenarios to move them on incrementally as well as identifying radically innovative scenarios (found at the highest layer of the matrix)

### 4.3 Eduvista integration with Edukata

Edukata is the toolkit produced by WP3 to produce a collaborative design process for educators to fill the gap between visionary scenarios and classroom practice. Scenarios developed from Eduvista can be used as a starting point for the creation of learning stories (subject non-specific modules that reflect the key aspects of the scenario, the personal interests and needs of students, and the classroom context) and the underpinning learning activities within Edukata. However, the scenario can be used as a basis for classroom practice directly, and learning stories can be created without having a scenario. Thus although the two can be used sequentially they can also be used independently.

### 4.4 Toolkit evaluation

Data has been gathered from workshops in Bristol, Bolton and from the survey and interviews of National Co-ordinators as well as from the quality and content of the scenarios developed so far. Six of the national case study interviews indicate that the iTEC scenario development process is widely viewed as innovative and that the final version of Eduvista will be of value at national level to a variety of stakeholders. This validation is an achievement given the short timescale for the creation and testing of Eduvista. Nevertheless, issues were raised about the toolkit and although the analysis so far is only preliminary and will be extended in Deliverable 2.4 some early conclusions follow.

#### 4.4.1 Toolkit structure

The benefits of the toolkit; allowing for the development of bespoke context specific scenarios, supporting the involvement of stakeholders, and allowing teachers to identify scenarios relevant to them on an ongoing basis are acknowledged. But the need to simplify the toolkit structure has featured in feedback since the first workshop. The initial paper toolkit was hard to navigate given the multiple choices for activities and consequently an online version was developed. The online version may still be complex and better use of video, would be useful. Given it will be used by those not involved in iTEC in the future this is a priority.

There is a need to be more explicit about what activities the facilitator needs to perform. Instead of a few teachers being facilitated to create scenarios the stakeholders now have the choice to adapt and adopt the process and tools to fit their requirements – be it how to identify trends, whether to meet face-to-face or online, or the numbers needed to feed into a scenario. This choice is illustrated by the templates used for expressing the scenarios. Only three of the twelve groups/countries that submitted scenarios used the template in Eduvista, a further two used the template from Cycle 4 (see 0), and the remainder designed their own. The template has been structured so that later activities, such as the evaluation process, are easier when the trends etc. are clearly identified so they can be assessed. This suggests that the idea of choice has been adopted, but an understanding of why they need to use the templates and techniques need to be emphasised. While there is no replacement for
experience in using the toolkit to ensure that it is adapted correctly, clearly training in the use of the toolkit is important in ensuring it meets its potential.

There is also a need to review the two processes for generating scenarios: creation from trends and adapting previous scenarios based on identified relevant trends. Only two of the 35 scenarios were adaptations. Is this because the previous scenarios were not relevant or that a bespoke scenario is more useful? Some of the teachers surveyed felt that the example scenarios within Eduvista should be more 'hands on' and relate more closely to their own experiences, for instance covering different subjects and age ranges taught. This suggests that they were not relevant, despite coming from stakeholders in earlier cycles, and more scenarios should be included to give a greater choice.

Finally, further research needs to be done as to whether it can be structured for different stakeholders; for example, one for the Ministries of Education with a national focus, one specifically for teachers, one for industry etc. This could reduce issues around terminology, and limit the volume of information presented – as the size of the original toolkit was also an issue. Although as it stands there is a belief that it could be useful at the national level:

In terms of future take-up of toolkits, he suggests that the Ministry needs to encourage and even require new ICT projects to first look at and use the iTEC methodology. New projects need to focus first on trends analysis, use the innovation maturity model and consider what is meant by innovation.

(Belgium, national case study)

4.4.2 Interactions and roles within the scenario development process

The role of teachers in the design process has expanded; as discussed this was a key to address ownership, sustainability and review. However, this shift leads to the question of whether the teachers have pushed for challenging scenarios and innovative practice? The absence of which in earlier cycles was raised as an issue (Bélisle et al. 2012). Although it will be addressed more fully in Deliverable 2.4 it is also worth considering whether or not teachers were happy with this shift in responsibility given their existing workload etc.

The toolkit has activities that can be done online or face-to-face, for example, identifying trends and experts, reviewing scenarios, provide feedback etc. However, a face-to-face workshop was recommended with required activities: for example, the discussion around the Innovation Maturity Model, the selection of relevant trends, the creation of the scenario. The majority of National Coordinators ran all the activities they selected in a face-to-face setting and produced a range of scenarios, some of which were highly radical.

As in the online Cycle 4 activities the online activities in Cycle 5 relied on the motivation of the participants to post ideas and maintain the community. Again the facilitator had to take a proactive role to ensure participation, for example, through organizing webinars, to ensure that this occurred. To create an online community requires a great deal of effort and shared purpose which needs constant mediation – and hence a dedicated stakeholder acting as facilitator. This suggests that although scenarios can be created using a combination of online and face-to-face activities the face-to-face element is vital. Not only in terms of the interactions that occur but also from the suggestion from Cycle 4 that the face-to-face element can be seen as some kind of “reward” for teachers. From Cycle
5 there was a suggestion that participants required a financial reward as well given the nature of the process. Others felt that they needed more time to understand the process and participate and this needs to be accommodated within their roles.

Another positive of the toolkit is the structuring of activities with external experts; working with industry was felt to be beneficial; as was being introduced to new technologies and pedagogies.

To summarise, stakeholders are key to the development of innovative scenarios. They need sufficient time, support, access to materials and it is easier if there is at least one face-to-face meeting either as a reward or more importantly to enable creative thinking.

4.4.3 Evaluation process

There is little data on the evaluation process. The evidence we have suggests, it was felt to be useful as it naturally led to the discussion of, for example, innovation:

*Working with trends created an atmosphere where innovative ideas easily came up. The scenario review dimensions also highlight weaknesses were improvements can be done.*

(Hungary NPC)

4.4.4 The Innovation Maturity Model

There is not yet evidence as to whether the model fulfilled all three requirements: as a tool for reflection, as a stimulus for reflection, and as an assessment tool. However, early feedback is positive. Four National Co-ordinators reported it was the Innovation Maturity Model which stimulated participants to think about innovation and another co-ordinator commented that this was well received, e.g.:

*The Innovation Maturity Model served as a basis for reflection and participants had the chance to position their schools regarding the different stages and to think about ways of moving forward and above.  

(Portuguese NPC)*

For another, it was the combination of reviewing scenarios and the Innovation Maturity Model which was key to innovation in the sessions:

*We need scenarios for different stages. This approach which provides teachers with the database of scenarios integrating innovation on different stages is of great value.*

(Slovakia NPC)

Terminology in the Innovation Maturity Model, is, as predicted, an issue. Terms like enrich or empower do not translate in exactly the same way in all languages because of the context they are used in and this was raised by the stakeholders. The descriptions in the model can never cover every aspect of a scenario and it is possible for participants to interpret one scenario as being at different levels, this cycle reinforces the instructions to discuss and agree a shared understanding of the matrix prior to its use. Any translation of the Maturity Model will need to capture the ‘spirit’ of each level, using the language linguistic conventions that resonates with users rather be a simple literal translation of the text.
4.4.5 Scenarios generated

As discussed the scenarios generated need to clearly show an incremental, or radical, innovation in classroom practice in one of the five identified areas within the Innovation Maturity Model. Assessing whether the generated scenarios contain innovations cannot currently be done as although the groups are asked to assess their current situation using the same model they were not submitted. However, looking at the radar diagrams, generated by plotting the stages of the areas in the Innovation Maturity Model (see Deliverable 2.2, Section 3.4.3), the majority of scenarios (seven out of ten in Cycle 4, and three of the thirteen from Cycle 5 workshops using Eduvista and six of the seven from the expert workshop) have at least one aspect at a stage 4, extending the practice. It should be noted this assessment is based on the written scenarios. It is not definitive as the learning stories that are generated or the scenario implementations are very individual – teachers adapt and adopt what they see fits with what they need to do. The actual innovation will not be seen until Cycle 5 is assessed after the scenarios have been implemented.
5. Scenarios: Development process and summary

In this section the two cycles are described along with the scenarios that arose; from using the Eduvista toolkit and from the expert workshops. It concludes with a reflection on the development process.

5.1 Cycle 4: Scenario creation process

5.1.1 Participants and activities

As agreed in the May 2012 change request no additional research was carried out, as the a wealth of information about trends and drivers had been collected in the previous cycles, and in other high profile EU projects (e.g. Stellar and ITILT) provided a solid enough platform for further scenario development. Instead in Cycle 4 relevant themes and trends of educational change, which have since become part of iTEC’s terminology, were crystallised and have shaped internal discussions about the project going forward (e.g., teacher realities, student realities, socio-economic trends and, obviously, technological trends and innovations). With respect to scenario development teachers were involved in a more direct, bottom-up approach as a community and a peer network with fewer face-to-face workshops. This allowed them to develop a stronger sense of ownership of the cycle 4 scenarios. This is demonstrated in the activities that identify and involve stakeholders and experts briefly described below.

- **Scenario development workshop with iTEC teachers** - took place on Saturday 14th January 2012 in London during the BETT week. 46 teachers from participating EU countries engaged in collaborative design activities which resulted in six draft scenarios that reflected local interests and challenges.

- **Integration of existing EU projects into scenarios** - In cycle 4, WP2 collaborated with and used information from the Stellar and ITILT projects to create three scenarios based on activities and reflections from these projects

- **Technology-focused workshop with iTEC partners** - Futurelab jointly ran a one-day workshop in April 2012 with iTEC partners that focused on ensuring that the technical vision and capabilities provided by our industry partners, Promethean and SMART Technologies, were used as inspiration to enhance the cycle 4 scenarios.

- **Online engagement with teachers** – teachers involved in the initial face-to-face workshop were invited to participate in an online engagement process to further develop the scenarios created at that meeting. This engagement included use of an online forum and focus groups (see Appendix C for a full description).

- **Scenario refinement workshop** – a second face-to-face workshop was held with iTEC teachers and partners to refine the existing scenarios. Held in mid-July, the Bristol-based workshop refined and enhanced the mini scenarios.

- **Dimension review** - by iTEC partners led by the Integration Committee (which replaced that to be done by Pedagogic Board) with respect to various dimensions, e.g., the level of innovation, the use of technology, etc. The report listing the key features and concerns was sent to WP3 alongside the scenarios who ensured the learning stories and activities kept/addressed the issues raised and this was validated by the Dimension leads.
5.1.2 Lessons learnt

The small “core working group” should be considered as the main achievement of the engagement process. Success is mainly down to the careful selection – or “self-selection” - of suitable participants, who were already motivated and familiar with the project. The face-to-face workshop held at the end to finalise the scenarios was key to their enthusiasm, as was the support of technical partners. Another feature was the maintenance of clear and consistent communication and the flexibility of the shared area.

However, arranging and running the online discussions in real-time was challenging. Despite teachers’ enthusiasm and their willingness to cooperate, their busy schedules and the complex nature of the scenario development process did not lend itself to one-hour Skype meetings. The development of scenarios relies on much more than simply asking teachers, no matter how “innovative”, to recount their experiences or give opinions and views. The role of face-to-face discussions, based on prompts, facilitated activities and emerging interactions (sometimes critical and argumentative) is crucial to create a sense of purpose and relevance. What is being described here is NOT a community of teachers; instead it is an “engagement process” that involved a rather small group of already motivated practitioners.

A clear incentivisation plan will be needed in the future in order to recreate the engagement process, alongside clarity about timescale and outcomes. It is important to specify a timeframe for the engagement process, with a beginning, some key milestones and an end-point. This will assist teachers to assess their availability and to make informed decisions about their commitment.

5.2 Cycle 4: Scenario summaries

Table 2 gives a brief description of the ten scenarios that were created in Cycle 4. It also has the radar diagrams that illustrate the level of innovation in the different areas. A full description of the radar diagrams can be found in Section 3.4 of Deliverable 2.2 but briefly the scenario is assessed against each aspect of the model to decide the degree of innovation (the stage): the higher the number the more innovative that area is felt to be. Two members of WP2 independently assessed each scenario against the criteria and discrepancies in scoring were discussed and agreed. As discussed, the model terminology is subjective and judgement must be used as to what stage is demonstrated.

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3 A full report of the Cycle 4 engagement process can be found in Appendix C
<table>
<thead>
<tr>
<th>Scenario title and radar diagram showing innovation levels</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher workshop</td>
<td>Using audio-recording equipment to record feedback given to a piece of student work. The recordings are uploaded to the VLE. Students are given extra-credits if they access the recordings and if they can demonstrate that they acted on the recommendations. The recordings give clues and direct students to additional resources (books, web-based, etc.). The broad framework of this scenario draws on self-regulated learning and formative assessment; both aim to develop self-assessment (reflection) in learning by helping students identify standards/criteria that will apply to their work.</td>
</tr>
<tr>
<td>Audio visual feedback</td>
<td></td>
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<tr>
<td>Audio/video feedback</td>
<td></td>
</tr>
<tr>
<td>Create a model</td>
<td>This scenario assumes that students develop models and visualisations to support an argument or to solve a problem. This scenario will require integration between Google sketchup, Google earth and some kind of presentation/visualisation software like Prezi. Teachers will need access to a network of support to carry this out, as well as access to expertise in different subject areas and to a wide range of skills. A whole-school approach would be particularly helpful for this scenario, one that brings together teachers, students, school leadership and the local community (e.g. parents).</td>
</tr>
<tr>
<td>Digital producers</td>
<td>This scenario assumes that students create “broadcasts” of curricular work: presentations, classroom discussions and other school activities. These are captured and recorded through various means, they are then edited and uploaded to the web or to the VLE. The scenario aims to engage pupils from 1000 classrooms across Europe in producing podcasts or short movies/animations about an aspect of the STEM curriculum. These outputs are shared across schools in different countries. Students and teachers provide feedback which is used to revise the outputs. Finally, the outputs take part in the iTEC Broadcasting STEM Learning’ competition as well as being uploaded to the school website/VLE as a means of sharing with the wider school community and parents/carers.</td>
</tr>
</tbody>
</table>
Digital tools for effective, engaging science

The scenario encourages the use of digital resources to undertake tasks in STEM subjects which would be difficult or impossible to do in most classrooms or schools. Teachers undertake research for online resources (e.g. online repositories) based on curriculum topics; while students work in groups. As well as using the online resources, they are encouraged to design their own resources.

GPS Enabled Learning

The scenario assumes that teacher use GPS devices to arrange geo-located treasure-hunts on school grounds, the search will lead to a location where puzzles and problems need to be solved. Students are actively involved in solving puzzles in the treasure hunt and building the activities/devising the games. Teachers act as moderators and facilitators, carrying out observations for evaluation/assessment. The scenario offers potential for involving parents and whole school community. For example, parents could participate in the games created by students.

Mindmapping the soil

This scenario assumes that mind-maps and related approaches are a powerful tool for learning, in particular to promote deep understanding while at the same time encouraging a cross-curricular approach. The scenario relies on collaborative knowledge building and on the classroom discussions facilitated by the teacher. There is also a strong element of inquiry-based learning. Students go on a fact-finding trip collecting information about the soil; the information is discussed, brainstormed and formalised in mind-maps, which are revised iteratively as students develop more in-depth understanding of the subject matter.

Hackspace
This scenario draws on the notion of “Hackspace”: a physical place where people can meet to learn, socialise and collaborate on projects. The informal learning opportunities provided by a Hackspace can increase creativity and encourage an entrepreneurial spirit in the classroom. In this scenario learning engages hands and potentially the whole body (gesturing at the Lizard for instance). It is supported by developments in cognitive science that suggest situated (social, authentic, learning environments) and embodied cognition (gesture-based, movement, using body not just the brain) can inform education. This scenario is partially based on the work carried out in the EU project Stellar.

Integration of existing EU projects into scenarios

ICT Journey

This scenario aims to inspire whole-school innovation that relies upon the notion of “maturity”. The scenario puts great emphasis on scalable and sustainable processes of technological integration. It describes the “journey” of a school towards increased ICT maturity and adoption, suggesting resources and forms of support. This scenario is partially based on the work carried out in the EU project ITILT.

IWB Journey

This scenario aims to promote classroom-level integration and innovative use of IWBs. The scenario is not subject-specific but focuses more on the process of IWB-enhanced teaching and learning. The scenario also encourages transformative and innovative uses of IWB, by describing one pedagogic strategy to move away from didactic approaches and towards advanced uses of the IWB involving dialogic interaction with students. This interaction sees teachers and students equally involved, with students actively taking part as producers of knowledge. This scenario is partially based on the work carried out in the EU project ITILT.
Refined existing scenario

Supported through Change

This scenario aims to support professional development of teachers using a model that combines cognitive apprenticeship (coaching) and peer teaching enabled by telepresence technology. An online professional network provides the general framework. Teachers meet and identify shared challenges or developmental opportunities through the network. They then arrange lessons in which one teacher is in the classroom, while the other acts as a coach through a telepresence system running on the IWB. The main advantage of such a system is the ability to provide adaptive, real-time support as challenging or critical situations arise; this translates into more effective, “on the job” professional development and, at the same time, into a more powerful learning experience for the students. This scenario is based on the significant revision of a scenario produced in Cycle 3, which was rejected. The main idea has been reworked adding a more innovative technological element and more specific developmental opportunities.

Table 2: Cycle 4 scenario summary

Seven of the ten scenarios are cross-curricular and the remaining three STEM focused. Half of them require students to develop resource materials for themselves and their peers. Looking at the pedagogy behind them two explicitly discuss how to develop and give feedback, two discuss the development of collaborative work and two are based outside the classroom. Two discuss the creation of a professional network of support for teachers. A range of technologies are advocated, particularly video cameras and video sharing sites such as YouTube; collaboration tools such as blogs and wikis; and Learning Management Systems and Virtual Learning Environments. This reflects the potential embedded within most of the scenarios to enhance learners’ collaboration, communication and self-management skills.

From the radar diagrams created from using the assessment from the Innovation Maturity Model it is clear that the scenarios illustrate a range of incremental elements and seven are radically innovative in at least one dimension (the scenarios score 4 or 5 eighteen times in total, and only three scenarios have no 4 or 5 scores). Interestingly it is the introduction of whiteboards (IWB journey) and technology

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4 Create a model, Digital producers, Digital tools for effective, engaging science, IWB Journey, Mindmapping the soil
5 Audio/video feedback, Supported through change
6 Digital producers, Mindmapping the soil
7 GPS Learning Games, Mindmapping the soil
8 Create a model, Supported through change
integration (ICT journey) that had the least radical innovation. These scenarios are based on the work of another EU project, iTILT. However, these are relevant scenarios and they were felt to be relevant as some schools are still in the process of introducing them and this scenario is a consideration of the most effective method of this.

5.3 Cycle 5: Scenario creation process with Eduvista
In Cycle 5 National Co-ordinators and EUN arranged workshops to create scenarios. As stated this is a shift in responsibility. In the previous four cycles unless participating in the one workshop to create scenarios for all partners the teachers had no input to content. This section describes the process and scenarios created using Eduvista, namely those from National Co-ordinators and the EUN CPD workshop, the selected scenarios are in section 5.25.4.

5.3.1 Cycle 5 participants and activities
In Cycle 5 the National Co-ordinators, industry partners, and EUN were encouraged to use the toolkit as they felt appropriate in their circumstances. Feedback was received via a survey designed by WP5 with input from WP2 and WP4 in which eight National Co-ordinators and two industry partners responded to (although there is not a correlation between scenarios submitted and survey completion).

Eduvista was designed to be flexible, with the facilitator choosing activities that match the numbers and expertise of the group. This was reflected in the time and numbers reported. According to the feedback 180 teachers, 21 teacher educators, 21 policy makers, 17 industry representatives and at least 41 others (academics, students, NGOs) were involved in workshops run by National Co-ordinators in 8 countries. Two of these did not submit scenarios for review, and another who had not completed the survey submitted one scenario. Another 26 teachers participated in a workshop held as part of the CPDLab run by EUN which generated a further 6 scenarios over the course of one day.

The time spent using Eduvista varied from 2 hours to 45 hours though time and numbers are no indication of the number of scenarios created (see Appendix G). For example, 155 stakeholders worked for 45 hours to create two scenarios in Turkey, yet SMART had 33 stakeholders working for 28 hours to create 11 scenarios. The majority of the activities were done face-to-face.

5.3.2 Cycle 5 lessons learnt
The surveys indicate that stakeholders appreciated a “pick and mix” approach to activities and selected what suited them and chose an appropriate way of working, for appropriate times and with appropriate numbers - as discussed in Section 4.4 However, as summarised in that section the structure and content of the toolkit needs refining and the instructions for use need to be more explicit. This impacted the assessment below as trends had to be deduced if not explicitly stated which may mean the wrong aspect was being evaluated.

5.4 Cycle 5: Scenario summaries of selected scenarios using toolkit
The following are the 13 scenarios selected by the Dimension Leads for review by the remainder of the iTEC partners. Each of the six dimension leads from the Integration Committee chose their top 15 from the 35 scenarios created by the experts and National Co-ordinator organised workshops (the two from the experts are in the next section). This list was compiled and the overall top fifteen selected
In this case their feedback was not sent to WP3 to incorporate into the learning stories and activities but to give feedback to the National Co-ordinators to use alongside the Edukata toolkit when they create their own learning activities.

<table>
<thead>
<tr>
<th>Scenario title and radar diagram showing innovation levels</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quadcopter with 3D printed parts</strong></td>
<td>In this project, already piloted in Austria, students must build a flight-capable drone (remotely controlled multicopter/quadrotor e.g. at <a href="http://quadcopters.co.uk">http://quadcopters.co.uk</a>) as part of their STEM lessons. When one or two model kits have been assembled, students design and construct a model using a 3D printer to create the parts. As students are motivated to make their model fly, they find out a lot about the required know-how through self-study. The combination of design, prototyping and practical implementation provides many opportunities for new teaching scenarios.</td>
</tr>
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</table>

| **Personalised learning paths** | The main purpose of the scenario is to improve student’s learning experience, and ultimately students’ knowledge and skills, by adapting learning paths to students’ needs. There are different levels of adaptation. First, teachers work with students to assess initial knowledge and define personal learning goals. Second, interactive and adaptive software is used to adapt exercises to students’ comprehension level and respond to emotional states during learning. Third, there is a global level adaptation where different groups of students will work on different subjects according to their interests to foster motivation and engagement. All over this process, students are encouraged to reflect on their learning and to create links between what they learn at school and the outside. Teachers guide students on their project and help them assess their learning over the school year. |

| Message in a bottle | |
The main participants are members of a class and their teacher – although others, e.g. parents, experts, the local community can participate. The scenario also encourages collaboration between student groups on an international level. Groups of pupils create puzzles (messages in a bottle) to other groups and hide them with the help of geolocation technology in the area. Teachers are mainly coordinators while students create, collaborate, evaluate and self-assess during the mini projects.

Coding to learn

In this scenario there is a collaboration between teachers and initiatives developed by organizations and private individuals in the IT sector, such as Let’s Teach the Kids to Code in Norway (http://www.kidsakoder.no/), or Computer Clubs for Girls (http://www.cc4g.net/) and its aim is to arouse interest in coding among children and adolescents. The reason is that there is a huge need for knowledge of coding and programming in the labour market, but this is not reflected in school subjects and curricula. In Norway the Let’s Teach the Kids to Code is in the process of establishing a collaboration with the local after-school programme, where students at the lower secondary level teach those at the primary level how to program games with the aid of visual programming languages such as KODU and Scratch.

Restructured school

The school day and curriculum has been adapted in this scenario. Older learners (those 13 and over) no longer need to be at school from 8:00 and leave at 15:00. Instead they have a specific two hour slot in which they have to attend. For the rest of the school day they work on projects or in a flipped classroom. Learners also collaborate during the week with other students that are working on the same project, or working to prepare for lessons after flipping. Furthermore students can decide where they need to go in order to fulfil their assignments, e.g. to the city, park, forest or library. Learners can borrow instruments and tools when required from the school.

The rationale for this is so that learners can cope with the big amount of information there is around, and how to use it in their projects. It allows learners to explore and create things and to collaborate and be taught or teach their peers.
Online tutors

This scenario describes an instant digital tutoring project using smart phones. A teacher is available online for each subject throughout the day. Students open the instant tutoring application on their mobile device and choose the subject they need help with. They then post their questions to a forum and the teacher answers. Because the answers are saved all the other students can see the questions and answers and learn from them.

Flipping the teacher: A teacher/student tech club

In this scenario teachers and students learn 21st century skills together rather than teachers learning as personal development. Those students with technical skills publicise them within the TechTutors skills bank. These TechTutors can be assigned to either a younger student group or a teacher or class that wants to develop that skill set. The TechTutors are also encouraged to work with the teachers at the lesson planning stage suggesting how they might harness technology to assist in the delivery or assessment of the lessons.

Advanced and willing students are encouraged and provided specialist training in IT and networking areas using curriculum developed by CISCO, Intel and others. They are given time to shadow visiting technicians, who are actively encouraged to share their skills with students. They also identify and organise appropriate personal training for teachers and interested students in relevant technology that they deliver in an after school club type environment. Ideally the school would work with a local IT training company to provide student TechTutors with a basic IT competence qualification.

Students designing demonstrations

In this scenario an Assessment Design workshop is held as part of a major curriculum review. Students are actively involved from the start as stakeholders and seen as valuable co-contributors of ideas. Working in small teams comprised of teachers and student representatives during a “learning development day”, they develop new example assessments for various types of learning activities that allow students to show their understanding of concepts and ideas. There is no presentation of ideal assessments or traditional models. Groups are instead
presented with a simple question…. “How could you best show your deep and wide understanding of this topic to others?”

The food challenge

Teachers collaborate to design a game fulfilling multiple curriculum requirements in this scenario. Each teacher creates a couple of challenges. Students use their own devices to find the QR code and access the task. Then as a group they have a week to solve the mystery – with the option of involving external experts – to score points. At the end there is a final challenge to prepare a presentation, animation, video, etc. ... that should teach students in primary or lower grades, about healthy eating using the material they've learned.

Pollution everywhere, collecting data

In groups students will be asked to research and prepare an interactive presentation around pollution. They collect data out of school with their devices: e.g. digital cameras, mobiles, tablet. Teachers also ask students to collect different samples of surrounding water to be analysed later on using the microscope. Students collect water from the nearby lake, water from rain, and water from home. All samples are recorded and captured with the document camera and shared between all groups. Students use social media or blogs created also to share their experiences and teacher uses the school web or LMS to share the resources with the class.

Each group will record their final presentation using the document camera and the teacher will keep all this material for evaluation and for next year to use as a class resource that could be used to flip the classroom.

History in my community

The scenario is set both in and out of the classroom, and in both the physical and virtual world. It uses ICT tools to facilitate collaborative work and will evaluate students’ attitudes, processes, skills and results. In teams students identify their own subject knowledge around history using predefined topic areas. Then each group elaborates on one topic, sharing their findings in an appropriate format. These are then used to create a virtual model of the town. Finally this is linked to the real locations using augmented reality via QR codes.

Table 3: Scenarios from National Co-ordinators selected for review
The scenarios had a focus on cross-curricula topics. Of the 13 eight were structured to be applicable to multiple subjects, for example, restructuring the school day. The next focus was on STEM (science, technology, engineering and maths) subjects – with four scenarios, and one with history. The radar diagrams show that there is a range of innovation in the various dimensions – enabling any school to select one that matches curriculum as well as physical requirements. Of these scenarios, only one had no score 4 or 5 in any dimension, and more elements were scored 4 or 5 than in Cycle 4 (28 compared to 18), reinforcing the perception of a general shift towards more innovative scenarios in the later stages of the project.

5.5 Cycle 5: Scenario creation process with an expert workshop
As discussed in the second recommendation (Bélisle et al. 2012) the development of small-scale pilots contemplating transformative innovations in European schools (typically the quest of a FP research funded project) that though more challenging to scale, would “push the envelope” were still required. That is, the scenarios would not be unrealistic blue-sky scenarios but capable of being conducted in small-scale pilots rather than across the wider European community which was the goal in earlier cycles.

To ensure such scenarios were created an expert workshop was held to complement those organised by the National Co-ordinators. Eight experts from academia (representing pedagogy and technology), industry and innovation funding organisations were invited to a one day workshop (for a description of the participants see Appendix D). As the experts were unconstrained by considering what is feasible in their schools circumstances (as is the case by those using the toolkit), and due to their knowledge of emerging technologies and pedagogies they were able to create scenarios that were considered radical.

The experts were shown the Innovation Maturity Model to give an idea of the areas to be covered in a scenario. Then they entered into a structured discussion to elicit: i) emerging technologies – for example, robots that recognise expression, and ii) innovative pedagogies – for example, collaborating with business to address real problems. These were entered into a table with technologies across the top, pedagogies down the side, and the group identified areas in which the two could be combined to form a radically transformative scenario. This also led to a discussion around scenario content, for example, what were the ethical issues around using neurofeedback in the classroom, should a teacher be allowed to infer levels of concentration? The six scenarios created were elaborated by the experts in small groups and then reviewed by the other groups before being formally written and submitted alongside those from the National Co-ordinators for review by Dimension Leads.

5.6 Cycle 5: Scenario summaries
The following seven scenarios were created in the workshop. Two of the seven were selected in the final fifteen to be reviewed against all dimensions, these are in

<table>
<thead>
<tr>
<th>Scenario title and radar diagram showing innovation levels</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical 3D projects</td>
<td></td>
</tr>
</tbody>
</table>
This scenario focuses on the solution of real life cross-curricula problems raised by the local community using inquiry based learning and which bridges the gap between formal and informal learning. External organisations present real issues to students who select those that interest them. Teachers then act as facilitators and work with the students – who work individually or in small groups on their project - to mentor and provide feedback. The students may also go beyond institutional boundaries and co-construct solutions with external organisations who also act as mentors. Students are proactive in designing their learning journey and are expected to contact experts and produce prototypes – physical or virtual – to effectively address the issue (students are encouraged to investigate the potential of 3D printers to address real problems. This is then assessed by the teacher and community.

From existing research that the best performances occur when students are “in the zone”; that is they are in a calm state and are performing at the peak of their abilities but with what seems little conscious effort. This scenario tries to teach students to replicate this condition, specifically in a music class. Initially students use technology to track their physical response (e.g. heart rate) in various situations. They research and discuss these readings and work on techniques to change physiological responses and monitor again. The students are then responsible for working out the effectiveness and amend their behaviour accordingly.

Table 4: Scenarios from expert workshop selected for review

<table>
<thead>
<tr>
<th>Scenario title and radar diagram showing innovation levels</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applications for solutions</td>
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</tr>
</tbody>
</table>
Students work in groups or individually to tackle real problems – often going beyond traditional subject competencies and institutional boundaries - identified by those in the local community with teachers and local businesses acting as mentors and facilitators. Students are expected to work closely with the wider community who provide feedback on their solutions and identify areas of importance to work on (this is an adaptation of the crowd sourcing model). It requires application development software, 3D printers and other prototyping equipment to generate solutions. But a key feature is the assessment process in which the products are presented physically in an exhibition structure as well as online, allowing constant review by all interested parties and as a resource to future students as well as a public portfolio for students.

Developing for developers

This scenario goes beyond the school boundary and aims to make the learner (working in groups or individually) a designer of their own learning journey. Local software companies act as mentors and provide a “real” working environment with teachers working alongside them. While they tackle an identified problem using business techniques the schools become a resource for students. Students are expected to integrate multiple subjects to develop solutions, and then prototype these – for example by using a 3d printer to produce something solid if required, or by producing wire frame models or mock ups of functionality. They constantly document progress which is reviewed by the local community, peers and teachers and at the end formally present and explain their solutions to interested parties.

Robot helpers

Robots and screen devices to support the flow of activities, content and data, which gives the teacher and learner timely data on learners’ experiences and achievements. The focus in this scenario is on using such technology to assist in the teaching of modern foreign languages. A key feature is the agile learning as the system responds directly to feedback from the students.
Community video challenge

The students are responsible for addressing a real task, for example the organisation of their school fair; they have autonomy but the opportunity to work with teachers and the community as mentors to complete their task. They have to work effectively together and structure their time appropriately. To document the best practice and explain their choices students must choose the technology (video cameras and editing software, blogs, web development software, video clips, animation software). After the event they review it and incorporate feedback into their presentations. These are then tagged and published.

Productive project work

This scenario is dependent on ubiquitous and shared computing and the ability to access external resources as well as student portfolios linked to analytics. The students select their own projects and learning objectives across subjects with teachers acting as facilitators rather than as lecturers. In the projects there is a high degree of peer learning and feedback, with teaching and learning distributed – being organised around the learner who is expected to work in and out of the school environment.

Table 5: Scenarios from expert workshop not selected for review

Despite the prior briefing given to the experts, the radar diagrams show that the scenarios were not all judged as particularly radical. In fact, the Community Video Project, does not appear radical in any dimension, however, the remainder all have some aspects at stage 4 – and two of the seven have the majority of dimensions ranked at stage 5. These were not chosen for review for iTEC Europe-wide trials – although they may be appropriate for a small scale trial.

Looking at scenario content, three focus around introducing “real world” problems encountered by business or the local community into the classroom. This reflects the discussion from the workshop. When discussing pedagogies the experts, none of whom were teachers, wanted to see a greater collaboration with the community as well as developing collaboration skills within the students. This partly reflects the need of business identified, that is, 1) students should be able to use knowledge learnt from across subjects and 2) they should know the formal process for solution design and specification. There is also an emphasis on the learner taking responsibility for the identification of task as well as its completion. Only in Robot helpers and Physical and neurofeedback in the classroom is the process handed to the students.

5.7 Reflections on Cycles 4 and 5

The changes made in the last two cycles were productive. Merging Cycles 4 and 5 has meant that Cycle 4 was less rushed allowing more time to engage teachers and other key stakeholders.
However, although the online teacher community and peer network could have been involved across the project - from the scenario development process in WP2 to the participatory design workshops and pre-piloting in WP3 and piloting in WP4 the amount of effort to create and maintain the teachers’ group meant this did not occur; interestingly, this input from the teachers led to scenarios with radical aspects in Cycle 4.

As discussed the Eduvista toolkit was received well. It has the potential to bring about incremental but sustainable change at the level of individual schools as well as at a regional and national level. It also allows for greater stakeholder ownership; which should mean that the scenarios developed are innovative within their context of use and will be used to improve practice in classrooms. Deliverable 2.4 will elaborate on lessons learnt; specifically on the structure, the roles, the evaluation process and the impact of the Innovation Maturity Model.
6. Legacy of WP2

This report has described the work of WP2 in the last two cycles. It has discussed the benefits of scenario development and rationale for the development of Eduvista and some early feedback. Eduvista needs further support both to refine content and presentation and in dissemination outside of iTEC partners. The latter in addition to the courses described in the dissemination plan. This could be from: i) an increasing involvement of governments and ministries OR ii) commercial development (whether or not centrally funded). In the remainder of this report these two approaches are considered.

6.1 Further development and dissemination

As discussed in Section 4.4 Eduvista needs further refinement in order to become a useful tool for education stakeholders. Given that there is limited time to do this as part of iTEC it may be possible to incorporate Eduvista and the refinement suggestions from the Cycle 5 review into an existing or new project. For example, incorporating the toolkit development into the Interactive Classroom Working Group; this is evolving from the Interactive White Board working group at EUN (inviting regions as well as MoE to join). This group is closely linked to the new Interactive Classroom which holds continuing professional development courses for teachers.

As well as incorporating suggestions from the Cycle 5 review (Deliverable 2.4) this approach could lead to the ongoing refinement of Eduvista. Through constant courses feedback on the structure, layout, and ease of use of the tools could be gathered and an iterative process of improvement implemented.

Furthermore, by inviting teachers from across the EU Eduvista would be disseminated beyond the iTEC partners. This would work in parallel with the promotion at conferences, including the Mainstreaming Conference in October 2013.

6.2 Commercial exploitation

6.2.1 Overview

In line with the goals of iTEC it is hoped that schools use the iTEC model as a regular part of the school development planning cycle. School leadership teams will use the iTEC toolkits in collaboration with their staff, stakeholders and learners. This will ensure that their plans not only address the immediate concerns of the school accountability framework, but also are sufficiently innovative to address the future needs of the school, its learners and its stakeholders.

While the toolkits will be freely available and promoted through school networks, approved iTEC consultants could offer their services to schools to work alongside them on a paid for basis. This will create an additional revenue stream for those consultants which will encourage them to promote the iTEC philosophy in the schools they support, helping establish a self-sustaining market. It would also be possible for the consultants to suggest improvements to the toolkit on the basis of their work in schools and possibly refine the toolkit further.

In the next section how this could be achieved within the UK is given as an example approach – as similar organisations exist in other EU countries this model could be applied across iTEC partners.
6.2.2 A proposed strategy within the UK

Within this emerging market for school support it is proposed to support both the demand and supply sides around school development through three strategic partnerships. In the UK partners have already been identified and approached with the idea of eventually developing a self-sustaining business model that will stimulate:

- the demand for the iTEC approach and its associated products through a strategic partnership with the leading, longest-standing independent network of schools in England (SSAT⁹)
- the supply of support for the iTEC approach and its associated products through a strategic partnership with the national association of educators, technologists and policy makers who share a vision for the role of technology in improving and transforming learning and teaching (Naace¹⁰)
- the future availability of technology products that support the iTEC approach through a strategic partnership with the trade association for UK-based companies that supply goods and services to the education sector (BESA¹¹).

In the UK these associate partners have been chosen because of their reach and reputation, and the strategic alignment between their objectives and the iTEC philosophy, and their experience developing services that operate in the schools market.

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⁹ SSAT - is the largest and longest standing network of schools in England with over 2000 members. Its Redesigning Schooling campaign aligns with the iTEC. SSAT has extensive experience offering costed services to schools, including a well attended annual conference (http://www.ssatuk.co.uk/)

¹⁰ Naace – is the professional association for those who are concerned with advancing education through the appropriate use of ICT. Naace members currently support schools in a variety of ways, including the use of the Self Review Frameworks and achieving the ICT Mark. Naace manages the network of ICT Mark assessors and has engaged over 1300 schools. Its 3rd Millennium Learning Awards aligns with the iTEC philosophy (http://www.naace.co.uk)

¹¹ BESA - British Educational Suppliers Association – is the trade association representing over 300 educational suppliers in the UK. The total turnover of BESA members is more than £1.8 billion per year. BESA provides advice on both UK and International markets, and the future of the education supplies industry
7. References
Le Boniec, M, Muñoz King P, and Ellis W (2012). Deliverable 4.3: SECOND VALIDATION REPORT ON LARGE-SCALE PILOTING, iTEC
## 8. Appendices

### Appendix A  Innovation Maturity Model

<table>
<thead>
<tr>
<th>Stage 5</th>
<th>Educational Outcomes</th>
<th>Educational processes</th>
<th>Management of teaching, learning &amp; assessment</th>
<th>Educational resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Empower</strong></td>
<td>Activities address personalised learning objectives that are negotiated with students and are reviewed and revised throughout.</td>
<td>Ubiquitous, integrated, seamlessly connected technologies support learner choice and personalisation beyond the classroom.</td>
<td>Learner as co-designer of the learning journey, supported by intelligent content and analytics.</td>
<td>Technology supports new learning services that go beyond institutional boundaries, allowing the school to broker services provided by others, such as learner communities of practice.</td>
</tr>
<tr>
<td><strong>Redefinition &amp; innovative use</strong></td>
<td>Learners take control of learning using technology to manage own learning, choosing the appropriate resources or tools to support their learning, such as choosing to join a MOOC to further develop their understanding of a topic.</td>
<td>Institutionally-embedded technology supports the flow of activities, content and data, providing an integrated approach to teaching, learning and assessment giving the teacher and learner timely data on learners’ experiences and achievements.</td>
<td><strong>Mobile and locative technologies supporting agile’ teaching and learning, that is, responding to situation</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Use of innovative technology, e.g. 3D printing, augmented reality. Using technology across boundaries, for example, integrating products made at home with those in school</strong></td>
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<table>
<thead>
<tr>
<th>Stage 4</th>
<th>Educational Outcomes</th>
<th>Educational processes</th>
<th>Management of teaching, learning &amp; assessment</th>
<th>Educational resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Extend</strong></td>
<td>Activities address learning objectives that go beyond traditional subject competencies to include cross-cutting 21st Century Skills such as collaborative problem solving.</td>
<td>Teaching and learning distributed, connected and organised around the learner, bridging the gap between formal and informal learning, through extended, productive, inquiry based learning.</td>
<td>Learner as ‘producer’ and collaborator using networked technologies to model and make such as learners developing their understanding of a physical, economic, or social process by creating a computer model.</td>
<td>Technology is used to allocate learning tasks and to track learners’ progress through a task to assess process skills alongside knowledge and understanding.</td>
</tr>
<tr>
<td><strong>Network redesign &amp; embedding</strong></td>
<td>Teaching and learning ‘redesigned’ to incorporate technology, building on research in learning and cognition. The teacher uses new pedagogies (such as the learner as teacher or concept mapping) to develop competences.</td>
<td>Learner as ‘user’ of technology tools and resources, such as office tools and search engines. The learner chooses the appropriate resources or tools for the task.</td>
<td>Technology and systems support differentiated provision within the classroom by providing a variety of entry and exit points to tasks and offering alternative routes through the tasks. Assessment evidence is generated throughout.</td>
<td><strong>Interacting with technology, for example, adding to blogs or wikis, using apps within a learning platform</strong></td>
</tr>
<tr>
<td><strong>Using software to programme, create websites, games, video clips, animations, 3D models etc. 1:1 computing</strong></td>
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<thead>
<tr>
<th>Stage 3</th>
<th>Educational Outcomes</th>
<th>Educational processes</th>
<th>Management of teaching, learning &amp; assessment</th>
<th>Educational resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enhance</strong></td>
<td>Activities address learning objectives that include higher order thinking and key subject specific process skills such as inquiry skills in science or presentational skills in languages.</td>
<td>Teaching and learning ’redesigned’ to incorporate technology, building on research in learning and cognition. The teacher uses new pedagogies (such as the learner as teacher or concept mapping) to develop competences.</td>
<td>Learner as ‘producer’ and collaborator using networked technologies to model and make such as learners developing their understanding of a physical, economic, or social process by creating a computer model.</td>
<td>Technology is used to allocate learning tasks and to track learners’ progress through a task to assess process skills alongside knowledge and understanding.</td>
</tr>
<tr>
<td><strong>Process redesign</strong></td>
<td>Learners take control of learning using technology to manage own learning, choosing the appropriate resources or tools to support their learning, such as choosing to join a MOOC to further develop their understanding of a topic.</td>
<td>Institutionally-embedded technology supports the flow of activities, content and data, providing an integrated approach to teaching, learning and assessment giving the teacher and learner timely data on learners’ experiences and achievements.</td>
<td><strong>Using software to programme, create websites, games, video clips, animations, 3D models etc. 1:1 computing</strong></td>
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<tr>
<td><strong>Use of innovative technology, e.g. 3D printing, augmented reality. Using technology across boundaries, for example, integrating products made at home with those in school</strong></td>
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<thead>
<tr>
<th>Stage 2</th>
<th>Educational Outcomes</th>
<th>Educational processes</th>
<th>Management of teaching, learning &amp; assessment</th>
<th>Educational resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enrich</strong></td>
<td>Activities address sequences of learning objectives addressing related areas of content within a subject domain.</td>
<td>Technology used interactively in support of familiar pedagogical approaches, with a variety of resources being matched to different learners’ needs.</td>
<td>Learner as ‘user’ of technology tools and resources, such as office tools and search engines. The learner chooses the appropriate resources or tools for the task.</td>
<td>Technology and systems support differentiated provision within the classroom by providing a variety of entry and exit points to tasks and offering alternative routes through the tasks. Assessment evidence is generated throughout.</td>
</tr>
<tr>
<td><strong>Internal Coordination</strong></td>
<td>Technology used interactively in support of familiar pedagogical approaches, with a variety of resources being matched to different learners’ needs.</td>
<td>Learner as ‘user’ of technology tools and resources, such as office tools and search engines. The learner chooses the appropriate resources or tools for the task.</td>
<td>Technology and systems support differentiated provision within the classroom by providing a variety of entry and exit points to tasks and offering alternative routes through the tasks. Assessment evidence is generated throughout.</td>
<td><strong>Interacting with technology, for example, adding to blogs or wikis, using apps within a learning platform</strong></td>
</tr>
<tr>
<td><strong>Use of innovative technology, e.g. 3D printing, augmented reality. Using technology across boundaries, for example, integrating products made at home with those in school</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage 1 Exchange Localised use</td>
<td>Activities address isolated learning objectives targeting specific pieces of subject content within the curriculum such as the life cycle of an insect, or prime factors.</td>
<td>Technology is used within current teaching approaches as a direct substitute for well established resources, such as using an IWB as a substitute for a chalkboard, or an e-Book as a substitute for a textbook.</td>
<td>Learner as ‘consumer’ of learning content and resources, where the content or resources determine the learner’s activity.</td>
<td>Learning is directed by the teacher and located within the classroom, with all learners following instruction in step. Technology is used to generate assessment evidence.</td>
</tr>
</tbody>
</table>
## Appendix B  Scenario template structure and changes

The table below shows the changes in the scenario template:

<table>
<thead>
<tr>
<th>Cycle 1</th>
<th>Cycle 2</th>
<th>Cycle 3</th>
<th>Cycle 4</th>
<th>Cycle 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADDITIONS</strong></td>
<td></td>
<td></td>
<td></td>
<td>The Innovation Matrix was included to support and assess the making of scenarios that contained incremental or radical innovation</td>
</tr>
<tr>
<td>Activities and tasks (what happens in the scenario)</td>
<td>The following were added:</td>
<td>No changes were made</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment (where the scenario is happening)</td>
<td>Vision (aspirations and aims)</td>
<td></td>
<td></td>
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<tr>
<td>Roles (who is involved in the scenario)</td>
<td>Background motivation (rationale)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactions between the other elements (how the scenario happens)</td>
<td>Trends (which trend is the scenario responding to)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resources (what is required to support the scenario)</td>
<td>Key concepts (main ideas)</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cycle 2</th>
<th>Cycle 3</th>
<th>Cycle 4</th>
<th>Cycle 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLARIFICATIONS</strong></td>
<td></td>
<td></td>
<td>The following extensions were made to scenario sections:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Who</strong> is involved in the existing scenarios? What are their roles?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Why</strong> have those involved in the existing scenario decided to change their practice? What is the core purpose of the scenario?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Where</strong> does the existing scenario take place? Describe the environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>When</strong> does the existing scenario take place?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>What</strong> happens in the existing scenario? What activities are the people in the scenario doing? What sorts of interactions are there between the people in the scenario?</td>
</tr>
<tr>
<td>The following were amended to clarify content:</td>
<td>The following were amended to clarify content:</td>
<td>Previous headings were used in toolkit as template for scenario</td>
<td></td>
</tr>
<tr>
<td>Roles became ‘people and roles’</td>
<td>Interactions became ‘possible approaches to teaching and assessment’.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactions between the other elements became ‘interactions (including pedagogies)’</td>
<td>Vision became ‘core purpose’</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix C  Cycle 4 online engagement process report
This appendix describes the online engagement process held after the first workshop to refine the scenarios. It then describes what worked, the challenges and risks and lists recommendations for future work.

Setting the scene
Teachers for the online engagement process were recruited through two channels:

1. By asking NPCs and technology partners to name suitable “innovative” practitioners from their own countries.
2. By contacting directly those who attended the BETT iTEC event that took place in London on 14 January 2012.

The process started in April 2012 and approximately 42 teachers were contacted. In total, 20 teachers responded positively to the invitation. Please see attachment with the lists of teachers.

A “work in progress” section on the blog developed by Aalto University was created to design and discuss cycle 4 scenarios: [http://itec.aalto.fi/scenarios/scenarios-in-development/](http://itec.aalto.fi/scenarios/scenarios-in-development/).

Credit goes to Aalto University for allowing Futurelab to set up the space and for the support they provided throughout the engagement process. Theirs was the view that a dynamic, easily customisable and “friendly” online environment like a Wordpress blog platform was more suited to the interactions that were trying to be facilitated.

Communication
A sub-section was created in the blog called “who’s who” to allow teachers to introduce themselves in an informal manner. The aim of this section was to “break the ice” and to create a permanent record of the online introductions that would contribute to a sense of group identity as the “online working group” of teachers: [http://itec.aalto.fi/scenarios/scenarios-in-development/whos-who/](http://itec.aalto.fi/scenarios/scenarios-in-development/whos-who/).

A number of emails were sent to teachers to encourage them to introduce themselves, and to keep them informed when somebody new would join the group or when updates about the collaborative process were posted. Keeping a constant and responsive email communication channel with the teachers was crucial to minimise dropout, which however still occurred as the number of participants who remained engaged in the process fell to 16.

Events
Online discussions lasting one-hour each were held on Skype. Participants were asked to select – using a doodle poll - suitable time slots. Our aim was to have no more than four participants in each discussion, given the difficulty of facilitating design-based conversations that would be more suited to a face-to-face context than a computer-mediated one. In total, three online meetings were held:

- Monday 7th May: three participants
- Thursday 31st May: four participants
- Tuesday 5th June: three participants
During such discussions a number of questions about the scenarios in development were asked:

- How would you actually do this in your classroom?
- What would students actually do?
- What other tools and resources would you use or suggest?
- What would students be learning?
- How would you evaluate and assess what they are learning?
- What else would you do and/or who else would you involve?

Their responses were captured and then analysed. Summaries were posted on the online space for further comments. The views and opinions of teachers allowed us to further refine the scenarios in preparation of a face-to-face workshop which took place in Bristol on 11th and 12th July.

WP2 also encouraged participants to comment on the summaries. Only a handful of follow-up comments were posted.

**What worked**

- The face-to-face workshop was an incentive and an opportunity to finalise the work started online, it provided an end point and a reward - its role is hard to overstate.
- The “core working group” of teachers - although small - should be considered as the main achievement of the engagement process. Success is mainly down to the careful selection – or “self-selection” - of suitable participants, who were already motivated and familiar with the project. The support of other project partners, the technical partners in particular (Promethean and Smart), was crucial to recruit teachers to sustain engagement.
- Tapping into existing networks and groups helped the engagement process. The teachers who positively responded to our invitations and kept motivated in the process until the end have histories of engagement and participation in established networks (such as those maintained by the technical partners).
- As already mentioned, the online platform (Wordpress, but other suitable alternatives exist) provided a range of functionalities which allowed for fast and responsive interaction with the participants. It was useful that the person in charge of the facilitation process had access to such functionalities and could create pages, approve comments and add content to the website independently and with a fast turnaround.
- Consistent and clear communication: being clear from the outset about the aim of the process and what the outcomes were going to be.

**Challenges and recommendations**

- Arranging and running the online discussions in real-time was challenging. Despite teachers’ enthusiasm and their willingness to cooperate, their busy schedules and the complex nature of the scenario development process did not lend itself to one-hour Skype meetings. The development of scenarios relies on much more than simply asking teachers, no matter how “innovative”, to recount their experiences or give opinions and views. The role of face-to-face discussions, based on prompts, facilitated activities and emerging interactions (sometimes critical and argumentative) is crucial to create a sense of purpose and relevance.
- In the process leading up the engagement with teachers, several statements of aims about the purpose of this “community of teachers” were made at the management level. These aims could be viewed as over-ambitious and unrealistic. Communities of practitioners develop
around very pragmatic topics (often relating to subject-specific teaching challenges and resources). The broad, aspirational focus given in this process was too vague and not conducive to the development of a community of like-minded teachers. Therefore, what is being described here is NOT a community of teachers. Instead it is an “engagement process” that involved a rather small group of already motivated practitioners. The process succeeded thanks to constant facilitation and to the clear promise of a reward (the face-to-face workshop, presented as a valuable and pleasant experience in its own right, and as an opportunity for professional development).

- A clear incentivisation plan will be needed in the future in order to recreate the engagement process, alongside clarity about timescale and outcomes. It is important to specify a timeframe for the engagement process, with a beginning, some key milestones and an endpoint. This will assist teachers to assess their availability and to make informed decisions about their commitment.
Appendix D  Expert workshop structure
In this appendix the participants and structure of the expert workshop are summarised. The workshop was held 23rd July 2013 at the NfER offices in Slough.

Participants

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof Don Passey</td>
<td>University of Lancaster</td>
<td>Professor of Technology Enhanced Learning</td>
</tr>
<tr>
<td>Tom Kenyon</td>
<td>NESTA</td>
<td>Programme Director: Education in a digital environment</td>
</tr>
<tr>
<td>Gill Leahy</td>
<td>Promethean</td>
<td>Head of European Teaching and Learning Consultants at Promethean</td>
</tr>
<tr>
<td>Dr Cathy Lewin</td>
<td>WP5, Manchester Metropolitan</td>
<td>Senior Research Fellow and Deputy Director of the Centre for Research in Technology, Innovation and Play for Learning (TIPL) research group</td>
</tr>
<tr>
<td>Gavin Dyke</td>
<td>Independent consultant</td>
<td>Independent education and technology advisor</td>
</tr>
<tr>
<td>Bob Harrison</td>
<td>DfE/Teaching Agency ICT expert group and Toshiba</td>
<td>Independent education and technology advisor</td>
</tr>
<tr>
<td>Len Daniels</td>
<td>Toshiba</td>
<td>Education and Public Sector Sales Manager</td>
</tr>
<tr>
<td>Dr Brett Bligh</td>
<td>University of Nottingham</td>
<td>Lecturer In Technology Enhanced Learning in the Department for Educational Research</td>
</tr>
</tbody>
</table>

Activity summary

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00</td>
<td>Tea &amp; coffee, informal introductions</td>
</tr>
<tr>
<td>10:30</td>
<td>Welcome, housekeeping (fire alarms, escapes, lunch etc.)</td>
</tr>
<tr>
<td></td>
<td>What is iTEC and what is goal of today?</td>
</tr>
<tr>
<td></td>
<td>What do we mean by radical – a discussion of the Innovation Maturity Model and terminology</td>
</tr>
<tr>
<td>11:00</td>
<td>Brainstorming technologies and pedagogies within a matrix in order to identify areas for scenario development that incorporate both emerging technologies and pedagogies in two groups</td>
</tr>
<tr>
<td>12:30</td>
<td>Lunch</td>
</tr>
<tr>
<td>13:00</td>
<td>Identify areas for future scenarios and key features</td>
</tr>
<tr>
<td>14:00</td>
<td>In groups discuss possible scenarios and write up</td>
</tr>
<tr>
<td>15:30</td>
<td>Final scenarios presented and then discussion and comment</td>
</tr>
</tbody>
</table>
Appendix E  Scenario selection process in Cycle 5

The thirty five scenarios were formatted by WP2 using the template from Eduvista. This was necessary as Table 6 shows that the majority of the NCs adapted the scenario structure.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Number of scenarios</th>
<th>Used the template fully</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Belgium</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>France</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>FCS Workshop Schoolnet</td>
<td>6</td>
<td>0 (Used planning process as final draft)</td>
</tr>
<tr>
<td>Hungary</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Norway</td>
<td>1</td>
<td>0 (Used planning process as final draft)</td>
</tr>
<tr>
<td>Portugal</td>
<td>1</td>
<td>0 (Used planning process as final draft)</td>
</tr>
<tr>
<td>Promethean</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>SMART</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1</td>
<td>1 (but Cycle 4 version)</td>
</tr>
<tr>
<td>Turkey</td>
<td>2</td>
<td>1 (but Cycle 4 version)</td>
</tr>
<tr>
<td>UK (Expert workshop)</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td>12</td>
</tr>
</tbody>
</table>

Table 6: Scenarios contributed and formatted

A further scenarios were also submitted but not included for selection as it was received so late; Gamification of the course from Estonia. NEXT-TELL presented a scenario they were currently implementing as part of their project.

The review process itself was co-ordinated by EUN. The instructions were:

**Step 1** –
Each dimension leader to select the top 15 scenarios they feel should be included in the selection process to EUN
EUN will then use the top 15 from each dimension leader to create a list of the top 15 ranked scenarios from all dimension leaders so that all dimensions use this same list.

**Step 2** –
Dimension leaders will then proceed with the selection process using just these 15 scenarios.
Dimension leaders should feel free to use all 34 in the selection process if they wish.
The remaining scenario’s will also be published on the EUN website, but in a folder indicating that they are additional to those formally reviewed as part of the iTEC process. In this way they will be made available to partners and the wider public, but it will be clear that they have not been through the normal quality control.

The final 15 scenarios were then sent to the six dimension leads to assess against their dimension. Each dimension lead was collaborating with three other iTEC partners. Each in turn assessed the dimension making comments on key concerns and areas of innovation and using the following scoring system:

The groups were then encouraged to discuss their scores and agree the ranking before sending to EUN.
Appendix F  Survey responses
The following is the summary of the surveys created by WP5 with input from WP2 and WP4 to assess the use of Eduvista.

Eight surveys were received from NPCs in June. At this stage, four (EE, FI, IT, TR) said they had not organised any training to date, so were not in a position to complete the survey. Updated surveys were received from AT, BE, HU and PROM in September. TR also returned their survey at this point, making a total of ten responses.

Who provided the Scenario Development Toolkit Training?

<table>
<thead>
<tr>
<th>Provider</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPC</td>
<td>AT, BE, FR, HU, IT, PT, SK, SMART, TR, UK</td>
</tr>
<tr>
<td>NTC</td>
<td>BE, PT</td>
</tr>
<tr>
<td>Other</td>
<td>ICT in Education Co-ordinator (PT), iTEC teachers (TR), Other (AT)</td>
</tr>
</tbody>
</table>

Where did the training take place?

<table>
<thead>
<tr>
<th>Location</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face</td>
<td>AT, BE, FR, HU, IT, PT, SK, SMART, TR, UK</td>
</tr>
<tr>
<td>Online</td>
<td>AT, IT, SK</td>
</tr>
</tbody>
</table>
## How many people received Eduvista Toolkit Training?

<table>
<thead>
<tr>
<th>Role</th>
<th>Austria</th>
<th>Belgium</th>
<th>France</th>
<th>Hungary</th>
<th>Italy</th>
<th>Portugal</th>
<th>Slovakia</th>
<th>SMART</th>
<th>Turkey</th>
<th>UK (Promethean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy makers</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Commercial providers</td>
<td>3 – IBM, Promethean &amp; Samsung</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>1 - provider-several product divisions</td>
</tr>
<tr>
<td>Teachers</td>
<td>29</td>
<td>8</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>15</td>
<td>100</td>
<td>8</td>
</tr>
<tr>
<td>Teacher educators</td>
<td>3 - from KPH Krems</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>1 educational NGO, 1 intern + 1 NPC LSL project</td>
<td>4 iTEC team</td>
<td>1 Head teacher</td>
<td>2 university teachers</td>
<td>NTC, Project manager, technical university lecturer</td>
<td>1 parent, 2 students and 8 pre-service teachers</td>
<td>30 Deputy/Head teachers</td>
<td>NPC, product developers, programmer, designer, on line communities representative, teaching consultant</td>
</tr>
</tbody>
</table>
How many sessions did you provide and how long did each session last?

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of sessions</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>5 x 1 hr (webinar) + 2 x 4 hr (face-to-face)</td>
<td>13 hours</td>
</tr>
<tr>
<td>Belgium</td>
<td>2 x 2 hr (face-to-face)</td>
<td>4 hours</td>
</tr>
<tr>
<td>France</td>
<td>1 x 5hr (face-to-face)</td>
<td>5 hours</td>
</tr>
<tr>
<td>Hungary</td>
<td>1 x 4 hr (face-to-face)</td>
<td>4 hours</td>
</tr>
<tr>
<td>Italy</td>
<td>3 x 1.5 hrs (online)</td>
<td>4.5 hours</td>
</tr>
<tr>
<td>Portugal</td>
<td>1 day (face-to-face)</td>
<td>7 hours</td>
</tr>
<tr>
<td>Slovakia</td>
<td>1 x 2hr (face-to-face)</td>
<td>2 hours</td>
</tr>
<tr>
<td>SMART</td>
<td>4 x 1 day (face-to-face)</td>
<td>28 hours</td>
</tr>
<tr>
<td>Turkey</td>
<td>2 x 1 week (4.5 hour sessions) (face-to-face)</td>
<td>45 hours</td>
</tr>
<tr>
<td>UK</td>
<td>2 x 3hr and 1 x 1 day (face-to-face)</td>
<td>13 hours</td>
</tr>
</tbody>
</table>

How did you present the Toolkit to your attendees and what kind of activities did you include in the training?

The level of information provided in response to this question varied considerably. The following are methods or approaches mentioned in NPC’s descriptions.

<table>
<thead>
<tr>
<th>Approach</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-workshop activities</td>
<td>FR, PT, SMART, TR</td>
</tr>
<tr>
<td>Presentation of toolkit</td>
<td>AT, FR, IT, PT, UK</td>
</tr>
<tr>
<td>Workshop activities to create/adapt scenarios</td>
<td>BE, FR, HU, PT, SMART, TR</td>
</tr>
<tr>
<td>Discussion to rank scenarios</td>
<td>FR, UK</td>
</tr>
<tr>
<td>Discussion of innovation matrix</td>
<td>SK, SMART, UK</td>
</tr>
<tr>
<td>Discussion of trends</td>
<td>SK, SMART, UK</td>
</tr>
<tr>
<td>Individual (or small group) ranking activity</td>
<td>SK</td>
</tr>
<tr>
<td>Gathering of participant expectations</td>
<td>SMART</td>
</tr>
<tr>
<td>Post workshop review/presentation of scenarios</td>
<td>AT, PT</td>
</tr>
</tbody>
</table>

The pre-workshop activities involved presentation of the toolkit via Moodle (PT); sharing the Trends Identification Questionnaire (TIQ) and Dimensions of Innovation Maturity Model Self Assessment in Googledocs (SMART); and emailed information about existing scenarios (FR).
EDUVISTA AND THE SCENARIO DEVELOPMENT PROCESS

Summary

The scenario development process is widely viewed as innovative.

Involvement in training has an impact on teachers beyond the workshop.

The process is thought to have a number of strengths, including supporting curriculum planning; bringing diverse partners together and supporting teamwork; highlighting new pedagogies and new technologies; allowing a focus on local priorities; and standardising approaches.

There are a number of ways in which Eduvista might be improved: simplifying the process; improving the presentation (including an online version); ensuring the vocabulary used is comprehensible for teachers; including more practical examples; integrating it with other iTEC outputs (especially Composer); allowing more time for scenario development; including assessment; and enhancing teacher engagement.

Eduvista has the potential to be included in initial teacher training programmes and continuous professional development, but activities in this area are at an early stage at present.

Data relating to the use of Eduvista and the scenario development process were collected via:

- An email survey of teachers (13 responses from 9 countries)
- An email survey of other stakeholders (2 responses from 2 countries)
- A face-to-face focus group with NPCs (all countries represented)
- An email survey completed by NPCs (11)
- Interviews with policymakers and others with a high-level overview conducted for iTEC national case studies.
- A review of the draft future classroom scenarios created\(^\text{12}\) (10 countries).

Overview of the scenario development process

In all countries for which responses were provided (10), the training was delivered by NPCs, although two NTCs and four trainers from external organisations were also involved in three cases. Ten countries provided face-to-face training and four also had online sessions. Between four and 45 hours were devoted to the training, with the average (mean) length of time being 12.2 hours.

\(^{12}\) Information about the training was provided from Slovakia although no scenario was available for review.
60% of participants from the ten countries from which data is available were teachers (183 out of 304). In addition, six countries involved policymakers; seven included commercial providers; eight engaged with teacher educators; and nine identified ‘other’ participants, including pre-service teachers, members of the iTEC team and university lecturers.

The approaches NPCs identified as being included within the Toolkit training are shown in table 1 below.

<table>
<thead>
<tr>
<th>Approach</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workshop activities to create/adapt scenarios</td>
<td>BE, FR, HU, NO, PT, SMART, TR</td>
</tr>
<tr>
<td>Presentation of toolkit</td>
<td>AT, FR, IT, NO, PT, UK</td>
</tr>
<tr>
<td>Discussion of trends</td>
<td>NO, SK, SMART, UK</td>
</tr>
<tr>
<td>Pre-workshop activities</td>
<td>FR, PT, SMART, TR</td>
</tr>
<tr>
<td>Discussion of innovation matrix</td>
<td>SK, SMART, UK</td>
</tr>
<tr>
<td>Post workshop review/presentation of scenarios</td>
<td>AT, PT</td>
</tr>
<tr>
<td>Discussion to rank scenarios</td>
<td>FR, UK</td>
</tr>
<tr>
<td>Individual (or small group) ranking activity</td>
<td>SK</td>
</tr>
<tr>
<td>Gathering of participant expectations</td>
<td>SMART</td>
</tr>
</tbody>
</table>

Table 1: Approaches to scenario development training by country

Continuation of the process post-training

Post-training support is still in its early stages. Five NPCs (AT, FR, NO, PT, UK) said they offered online post-training support (e.g. webinars, forums). Four out of five partners with plans for on-going support (AT, BE, PT, UK) mentioned using existing systems:

- Portugal: on-going support will be provided using iTEC national community forums.
- Belgium: making use of the ‘METROsystem’
- Promethean: plans to extend online support to include community forums and support for Q&A and discussion.

In Turkey, an additional face-to-face meeting is planned.

Some of the teachers who attended made efforts to continue the work begun during the training by:

- working on an action plan (5 teachers and 1 stakeholder).
- detailed scenario writing (1 teacher)
- reviewing scenarios produced (1 teacher).
- continuing to exchange ideas with others who had attended the workshop (1 teacher)

Three teachers said they had shared their experiences with other teachers in their school and, in one case, with students too. One had shared their experiences more widely:

The project was presented to the school community. I engaged my colleagues in the use of new teaching activities and tools. I shared iTEC project files and results online in the iTEC community and Facebook. I shared my own good practice in the local Webinar and iTEC.
website. I use web based services such as Gmail, Facebook, ThinkBinder for communication and collaboration and sharing ideas with other teachers from my country.

(Lithuania, teacher)

In addition, two teachers said they had changed their own teaching practices following the workshop:

I have used a lot of the technology tools that I found out about from other teachers and have used the 'explore, map, make, show' words when planning lots of activities. (UK, teacher)

**Scenarios created**

Ten partners submitted case studies devised using Eduvista, which are shown in table 2; those in purple were included in the top 15 reviewed by the Integration Committee.

<table>
<thead>
<tr>
<th>Country</th>
<th>Scenarios submitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>1. Quadcopter with 3D printed parts</td>
</tr>
<tr>
<td>Belgium</td>
<td>1. Create collaboratively a class quiz</td>
</tr>
<tr>
<td>Estonia</td>
<td>1. Gamification of the course</td>
</tr>
<tr>
<td>France</td>
<td>1. Personalised learning paths</td>
</tr>
<tr>
<td>Hungary</td>
<td>1. Message in a bottle</td>
</tr>
<tr>
<td>Norway</td>
<td>1. Coding to learn</td>
</tr>
<tr>
<td>Portugal</td>
<td>1. Students as creators of digital learning resources.</td>
</tr>
<tr>
<td>PROMTECH</td>
<td>1. Flipping the teacher</td>
</tr>
<tr>
<td></td>
<td>2. Students design their own demonstrations of understanding</td>
</tr>
<tr>
<td>SMART</td>
<td>1. Virtual museum</td>
</tr>
<tr>
<td></td>
<td>2. Touch the future</td>
</tr>
<tr>
<td></td>
<td>3. Food challenge</td>
</tr>
<tr>
<td></td>
<td>4. Solving maths operations</td>
</tr>
<tr>
<td></td>
<td>5. Self portrait</td>
</tr>
<tr>
<td></td>
<td>6. Pollution everywhere</td>
</tr>
<tr>
<td></td>
<td>7. Link to reality</td>
</tr>
<tr>
<td></td>
<td>8. Flipping the class</td>
</tr>
<tr>
<td></td>
<td>9. Inspire you with collaboration</td>
</tr>
<tr>
<td></td>
<td>10. History in my community</td>
</tr>
<tr>
<td></td>
<td>11. Collaboration</td>
</tr>
<tr>
<td>Turkey</td>
<td>1. Using Mind Mapping in Analyzing, Creative Writing and Critical Thinking</td>
</tr>
<tr>
<td></td>
<td>2. Using interdisciplinary school subjects and technology to enrich teaching and learning</td>
</tr>
</tbody>
</table>

**Table 2: Scenarios created by partners**

**Innovation in the Future Classroom Scenario process**

Comments in some of the national case study interviews (6) indicate that the iTEC scenario development process is widely viewed as innovative and that the final version of Eduvista will be of value at national level to a variety of stakeholders:

Once they are completed, [the interviewees] believe that the iTEC toolkits will be of great value at national level.

(Finland, national case study report)
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. [...] However, what is innovative for Interviewee C is the involvement of a wider range of stakeholders in the process, particularly students.

(France, national case study report)

The most far-reaching change relating to the iTEC process is perceived to be the structured approach to documenting and sharing best practices facilitated through the scenario development toolkit.

(Hungary, national case study report)

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

(Portugal, national case study)

Interviewee A found all parts of the iTEC process were innovative. Scenario development produced some great ideas, e.g. flipped learning, and teachers were involved in the process.

(UK, national case study)

Innovation was also a key theme of the training sessions. Several NPCs said that the scenario development training had included a discussion of definitions of innovation, including what this might mean in technical and pedagogical contexts (AT) and the innovative elements of the scenarios (FR).

One NPC felt that the activity of identifying trends and reviewing scenarios naturally led to the discussion of innovation:

Working with trends created an atmosphere where innovative ideas easily came up. The scenario review dimensions also highlight weaknesses were improvements can be done.

(Hungary)

For four NPCs (AT, IT, PT, SMART), it was the Innovation Maturity Model which stimulated participants to think about innovation:

The Innovation Maturity Model served as a basis for reflection and participants had the chance to position their schools regarding the different stages and to think about ways of moving forward and above.

(Portugal)

For yet another, it was the combination of reviewing scenarios and the Innovation Maturity Model which was key to innovation in the sessions:

We need scenarios for different stages. This approach which provides teachers with the database of scenarios integrating innovation on different stages is of great value.

(Slovakia)

Two NPCs felt that focusing on the types of technologies which could lead to teachers thinking more innovatively:

Using technology in my workshop to make people collaborate, to engage them in the workshop…Showing attendees how to use technology in an innovative way…Asking
attendees to participate using their own devices to send feedback to the board or to complete activities using XC add on for Notebook  

(SMART)

Encourage use of a different technology in the scenario, discussed why and how it is different. Explicitly focus on the pedagogy of the technology in the scenario. Here are some examples – QR codes, Edmodo, Mind Mapping tools, Team Up.  

(UK)

Positive aspects of the scenario development process

NPCs in the focus group felt that, although it was too early to detect impact, identifying trends, the innovation matrix and reviewing existing scenarios were potentially valuable aspects of Eduvista.

Ten teachers and one stakeholder rated their experience of the scenario development process as ‘very good’ (5) and the other three teachers and one stakeholder rated it ‘good’ (4). When asked to explain their rating, teachers described the experiences using terms such as “stimulating” (Portugal), “engaging” (Lithuania) or “inspiring” (Norway).

The positive features of the scenario development process identified by teachers and other stakeholders are described below.

Supporting curriculum planning

Two teachers and one stakeholder felt that the process had introduced them to a useful tool which could support curriculum planning:

The key words about different elements that make up an activity are useful to plan a whole activity and using the four post it notes…was a really valuable planning activity.  

(UK, teacher)

…the possibility of working with other teachers of my own school as a team in a different way as in the daily basis, starting the scenario creation from zero, sharing different points of view (regarding the levels of our students, the different subjects we teach, the different level of ICT skills,…)

(Spain, teacher)

Clearly, new ways of learning and teaching are needed. The future classroom process is highly valuable to provide room and a structured approach to develop these ideas.  

(Austria, stakeholder)

Fostering teamwork, collaboration and bringing diverse partners together

Two teachers thought that meeting other teachers was an important part of the process and the two stakeholders said they had enjoyed working with teachers:

I had interesting interactions with others and felt that I could contribute.  

(Norway, stakeholder)

The most interesting aspect, according to me, is the interaction among colleagues

(Italy, teacher)

NPCs also identified collaboration as being of significant value:
The team work and discussion with different stakeholders is of great value (Slovakia, NPC).

To bring teachers and industry together. However, we noticed that industry found it hard to contribute with their ideas to improve technology within scenarios. (Portugal, NPC)

Discovering new pedagogies

Three teachers said that the training had introduced them to new teaching ideas:

I have learnt a lot to improve my teaching methods (Finland, teacher)

Discovering new technologies

Three teachers said they had found out about new tools:

I tried to find out more tools and to work creatively (Lithuania, teacher)

Participation, engagement and motivation from attendees, good reflexions and outcomes. (SMART, teacher)

Encouraging a standardised, professional approach

In one of the national case studies, Eduvista was seen as facilitating a professional approach to developing and documenting best practice.

The most radical change for Hungarian teachers is that they “can produce best practices in a more structured way” (Interviewee A) making “the process much more professional.” (Interviewee B) (Hungary, national case study)

This view was echoed by one of the stakeholders responding to the survey:

Clearly, new ways of learning and teaching are needed. The future classroom process is highly valuable to provide room and a structured approach to develop these ideas. (Austria)

Allowing a focus on local proprieties

In one of the national case study interviews, the fact that the scenario development process could be used to respond to issues considered important either regionally or nationally was seen as a valuable feature:

The iTEC model also allows for scenarios and learning activities to be design specifically to tackle the issue of youth employability. (Austria-national case study)
Other positive aspects of the process included: creativity (FR-NPC, HU-teacher); engagement and motivation (SMART-NPC); the production of practical outcomes which participants and others could use (AT-NPC, BE-NPC); learning about new trends in education (HU-teacher).

**Improvements to Eduvista**

NPCs, teachers and other stakeholders offered a number of suggestions to improve Eduvista.

**Simplification**

Although this was not mentioned as a significant problem in the teacher surveys, according to NPCs, teachers perceived the first version of Eduvista to be ‘complex’, ‘overwhelming’ and ‘scary’; they felt that it needed to be simplified if it was to be adopted more widely. In order to make it seem more manageable and less time consuming, several NPCs had presented the Toolkit in short sections or selected those sections they felt were most relevant to present to teachers.

**Presentation**

NPCs had several suggestions to improve the presentation of Eduvista, which they hoped would help to simplify it for teachers.

For most, the printed version of Eduvista was seen as a prototype; there was an expectation that the final version would be online. This would allow different routes into, and through, the Toolkit starting from the technologies or pedagogical style which the teacher wanted to use for example. A number liked the idea of an app and the use of icons.

Several wanted to see a short introduction to Eduvista to explain its purpose to anyone not familiar with the process, perhaps including instructional or demonstration videos. In the survey responses, an NPC suggested the inclusion of clear instructions and checklists for the facilitator.

There was also support for a template which could be populated by each country to meet local needs.

Another idea was to produce different versions of the Toolkit for different stakeholders, for example, teachers, schools and trainers.

The suitability of the name ‘Toolkit’ was debated in the focus group; although some where happy with the name, others were not convinced that ‘toolkit’ was the best way to describe the resource.

**Vocabulary**

NPCs reported that some of the terms used in Eduvista are not familiar to teachers as they come from a management world rather than an educational one. Also some words or phrases used in Eduvista, and also in the associated Innovation Matrix (e.g. enrich, empower), do not translate in exactly the same way in all languages.

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13 Possibly because the teachers had prior experience of iTEC so were familiar with some of the processes and terms used.
One NPC commented that Eduvista might be strengthened by building on the vocabulary used in existing frameworks produced for teachers, such as Microsoft’s ‘Partners in Learning’.

**Inclusion of more practical examples**

Among teachers surveyed, two felt that the examples used within Eduvista should be more ‘hands on’ and relate more closely to their own experiences, for instance covering different subjects and age ranges taught.

**Integration**

Some NPCs felt that Eduvista was not sufficiently integrated into other aspects of iTEC at present. One suggestion was to include the Toolkit within Composer.

**Allowing more time to implement**

In the surveys returned, four NPCs (BE, FR, SMART, UK) identified lack of time as a challenge:

> After a long interesting discussion we had a set of identified trends, we knew our place in the innovation matrix but it was still hard to turn them into an exciting scenario. When it should have come to writing the narrative, we were quite confused by the complexity of things our scenario should include or address.

(Hungary)

> They sometimes need more time, as discussions were really interesting

(SMART)

One teacher also identified this as an issue.

**Assessment**

Assessment was an aspect of teaching and learning which some NPCs felt was missing from the first version of Eduvista.

**Encouraging greater teacher engagement**

The motivation and enthusiasm of participants was seen as an important enabler by three NPCs (FR, HU, SK). If this was not present, problems might be experienced, for example:

> Teachers didn’t post their ideas, so we had to organize webinars to come in contact

(Austria-NPC)

One NPC felt that the level of work asked of participants was not something which they could be expected to do without payment:

> To collect different stakeholders and ask them to do the job for free (assessment of scenarios according agreed criteria is high level work which should be paid)

(Slovakia-NPC)
**Future development of Eduvista**

Among NPCs, there was felt to be a good fit between Eduvista and **Initial Teacher Training** as trainees have to be conversant with technology. Several countries are working towards introducing Eduvista into initial teacher training programmes, although this is an early stage at present:

- He has already shown the draft Future Classroom Scenarios toolkit to people from two teacher training institutions and they are interested in using it.
  
  *(Belgium, national case study)*

- The aim is to offer the Future Classroom Scenarios course to the 12 teacher training schools.
  
  *(Finland, national case study)*

**Teacher trainers** were seen as an important audience for Eduvista; this group was in a good position to create scenarios and introduce them to teachers.

NPCs felt that, if Eduvista is to be widely adopted, it needs to have a clear value over and above existing systems already in use.

In some of the national case study interviews, ideas to sustain and embed Eduvista at a national level were discussed:

- The iTEC scenarios and the toolkit to produce them could be sustained in the UK, if relationships are built up with key people at the point where decisions are made (schools or clusters of schools). A UK-centred seminar with such key enabling organisations would work. Also, face-to-face, one to one, inputs to conferences, BETT, TeachMeets etc.
  
  *(UK, national case study report)*

- In terms of future take-up of toolkits, he suggests that the Ministry needs to encourage and even require new ICT projects to first look at and use the iTEC methodology. New projects need to focus first on trends analysis, use the innovation maturity model and consider what is meant by innovation.
  
  *(Belgium, national case study)*