D3.2 Recommendations and resources to support innovation within ITE

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# TABLE OF CONTENTS

1 EXTENDING THE ITELAB MODULE FRAMEWORK AND DEVELOPING FURTHER ROUND PILOT MATERIALS..................................................................................................................1

1.1 Background .............................................................................................................................................................................1

1.1.1 Introduction to D3.2 ................................................................................................................................................................. 1

1.1.2 Design Concept; summary restatement ................................................................................................................................. 3

1.1.3 Approach & Direction; summary restatement ...................................................................................................................... 3

1.1.4 Design challenges; summary restatement ............................................................................................................................. 4

1.1.5 ITELab Module–ITELab MOOC connectivity; summary restatement .................................................................................. 4

1.2 Devising the ITELab Module Architecture; the underpinning ontology & design restated ............................................................... 5

1.2.1 Approach, purpose, and intention ........................................................................................................................................... 5

1.2.2 Authoritative/Defining sources; content, pedagogy and design .......................................................................................... 6

1.2.3 Concluding comment ............................................................................................................................................................... 8

1.3 Module development ................................................................................................................................................................. 9

1.3.1 From inception to co-design and full-test ............................................................................................................................... 9

1.3.2 Module Design Work schedule .............................................................................................................................................. 11

1.3.3 Focus of Activity and Input by Project Partners; May2017-Dec2017 [M5-M12] ... 14

1.3.4 Focus of Activity and input by Project Partners; Jan2018-Aug2018 [M13-M20] .. 14

1.3.5 Focus of Activity and input by Project Partners; Sept2018-Dec2018 [M21-M24]. 15

1.3.6 Focus of Activity and input by Project Partners; Jan2019-Jun2019 [M25-M30].... 17

1.4 Support for Local Testing of ITELab materials .......................................................................................................................... 19

1.5 ITELab Student Learning Hub and Facebook Page .................................................................................................................. 20

2 INTERIM RECOMMENDATIONS .................................................................................................................................................... 21

2.1 ITE PROVIDERS: Working with Company CPD Resources and Teacher Communities ........................................................................ 21

2.1.1 INTERIM RECOMMENDATIONS FOR ITE PROVIDERS ........................................................................................................ 21

2.2 Closing Commentary ................................................................................................................................................................. 23

3 BIBLIOGRAPHY ........................................................................................................................................................................... 24
1 EXTENDING THE ITELAB MODULE FRAMEWORK AND DEVELOPING FURTHER ROUND PILOT MATERIALS

1.1 BACKGROUND

1.1.1 Introduction to D3.2

The purpose of this Report is to build on its predecessor D3.1. Specifically, to:

- discuss the learning resulting from the piloting of ITELab modules at beta and full-pilot stages and note how this impacted the design and practices embedded in the frameworks;
- offer revised recommendations for how ITE providers can better exploit CPD, resources from industry partners and access their teacher communities; and
- offer revised recommendations for how ITE curricula can be improved to better reflect the needs of newly qualified teachers who will be entering classrooms and schools where ICT is increasingly pervasive, based on lessons emerging from the pilot stage.

[ITELab D3.2 Specification; 575828-EPP-1-2016-1-BE-EPPKA2-KA]

As part of the ITELab project, UCD Dublin has taken on the role of leading and guiding in the development of a number of modules on ICT and technology for use with students in initial teacher education settings. In total, we developed 3 connected but independent module frameworks over the life of the project, covering ideas and activities that will be useful to student teachers in the early stages of their career. These cover thinking about and working in school-settings on topics connecting to digital citizenship, digital literacy and fluency. The focus throughout has been on capacity building for meaningful digital pedagogy.

The underpinning purpose of all of this is not simply the making of modules: it has been to develop and trial a generative, flexible, and transferable methodology to support the systemic design and development of digitally-strengthened frameworks for initial teacher education students learning that embodies an innovative and creative approach to enhancing learning & pedagogy. We worked to ensure that these frameworks are infused with a strong digital ontology, drawing from leading-edge literature on learning design and recent policy-experimentation in EU level projects which addresses the nature of digital capability in instructional settings. Taken together, the literature and emerging results from ongoing policy-experimentation offered a basis on which to identify sets of concepts and categories that exhibit properties and relations which we used to define and then develop a novel learning & teaching architecture to underpin the ITELab materials. Essentially, we built and tested, then rebuild and retested on the basis of ongoing project
evaluations and continuous formative monitoring. Section 1.2 of this document outlines and discusses this process in some detail. In the longer term, this work both provides a robust set of starting materials and also a well-tested model for other ITE centres to use in developing similar frameworks, activities, and materials.

Section 1.3 and 1.4 of this Report detail project work-in-progress relating to WP3 whose core objective is “boosting innovation in Higher Education” by enabling ITE providers and ICT companies to work together in order to:

- develop new course modules for student teachers that prepare them as new entrants to the profession to make innovative pedagogical use of ICT; including by adapting existing continuing professional development (CPD) resources from companies; and
- rethink the way that the pedagogical use of ICT is covered in ITE and provide recommendations and innovative start-out materials and guidance for how higher education institutions beyond the project should adapt their curricula.

[ITELab Wp3 Specification; 575828-EPP-1-2016-1-BE-EPPKA2-KA]

The work reported below primarily concerns ITELab WP3 Tasks 3.1 and 3.2. It expands on the work recorded in our earlier D3.1 Report [to M12] and relates to the remodelling of the ITELab modular/ framework offerings post-beta version trial and subsequent re/testing and refining of these. The original project timeline intended that one full-pilot in the spring 2018 would be adequate to capture and document the learning resulting from the tasks, and that D3.2 would report on this [M20]. This proved too optimistic. The beta and full-pilot raised many interesting and unforeseen possibilities and challenges. Following discussion with the full partnership, the UCD team recommended a further cycle of work on the frameworks in order to capitalise on the advances made in the early work and on what was learnt from both the ITELab Development Workshop in June 2018 [M18] and from the initial evaluations of the modules presented in Course Module Evaluation Report 1 D5.2 provided by the University of Würzburg – ITELab evaluation partner. This additional cycle ran through the autumn of 2018 and the spring of 2109 [M20-M30]. Expanding the design and test process proved extremely beneficial although it delayed the reporting process by a number of months.

Essentially D3.2 reports on substantive developments that occurred in the full-pilot phase [M12-18] and the additional second cycle [M20-30] which followed. It traces and explains major changes of tone and direction over this timeframe, the deepening nature of the partnership that supported these, and it presents the three ITELab module frameworks as they were configured at end M30.

D3.3 when published [M36] will consolidate and finalise this discussion and formalise the interim Recommendations made in this D3.2 and the previous D3.1 Report.
1.1.2 Design Concept; summary restatement

The UCD ITELab team presented to the first partnership design workshop meeting (May 2017) a design approach drawing from ongoing work at UCD and on earlier work on Open Educational Resource (OER) repositories, and Massive Open Online Courses (MOOCs) by Conole (2015) and others1. Starting from this and the responses harvested at that initial meeting, we developed a set of qualities and practices that we proposed should characterise an ITELab module. This approach was based on the following principles: well-integrated pedagogical approaches; design principles relating to open access; the provision of guidance & support to ITELab colleagues running a pilot module; content and activities that are customized from existing resources within the project partnership rather than developed from scratch; inbuilt participant opportunity for reflection & demonstration; an approach that fosters communication & collaboration opportunities within and across ITELab partner universities offering the Q1/2018 test-module.

Section 2 of the earlier D3.1 Report discussed those principles in detail.

1.1.3 Approach & Direction; summary restatement

For the beta pilot stage, the UCD ITELab team worked-up and trialled an initial module - Teaching, Learning, & Professional Development in the Digital World - in order to get participant student and partner feedback that would inform the subsequent design and development of the pilot ITELab modules ahead of a full trial in Q1/2019. These modules were envisioned as holistic and designed in a form that was ECTS accreditable but self-contained enough to retain the possibility of being used as standalone offerings.

The principal planning challenge faced initially involved all Project Partners agreeing on a design architecture and shared approach to module development to include; headers / themes for modules; layout and specifications for module wireframes; early decision on platform for beta test; and ways of documenting our progress in order to facilitate lessons from the experience of designing this first module.

A proposed line of approach and design architecture was put to the project partners at the design workshop meeting by the UCD team (May 2017). This was accepted. We then began work on the modules. This was guided by reference to Conole (2013) whose OLDS-MOOC2 project provided a clear, seven-step design pathway to inform key decisions in relation to the module development, and to assist in scoping the stages and steps required. This process was explained previously in detail in D3.1 Section 2.

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1 https://opennetworkedlearning.files.wordpress.com/2015/05/the-7cs-of-learning-design.pdf

2 http://www2.le.ac.uk/projects/oer/oers/beyond-distance-research-alliance/7Cs-toolkit
1.1.4 Design challenges; summary restatement

Even with the agreed direction of travel resulting from the initial design workshop, ensuring coherence and fit within the draft module materials proved challenging. Over the initial design stages, the UCD team worked with the project coordinator and our industry partners to first identify and then match the emerging materials and pedagogy to two reference frames; the well-established TPACK framework (http://www.tpack.org/) already in use among several of the project partners and the DigCompEDU Framework, the outcomes of an ongoing project of the EC ERC at IPTS Seville (https://ec.europa.eu/jrc/en/digcompedu).

The first provides us with a framework that combines three knowledge areas: technological knowledge, content knowledge, and pedagogical knowledge. This offered a useful way of gauging how the content and activity elements of an ITELab module might work together to increase learner motivation and make the content more accessible to the student mix the partnership presents. The second framework – the DigCompEDU – offered a robust, well-considered, if still evolving, methodology to describe and place in relation to each other a range of digital competences and capabilities specific to an educational context and with an underpinning sets of descriptors and levels that could be used to inform the development of our modules.

Together, these frameworks offered the UCD team a comprehensive reference set against which to identify and describe, and then build into prototype module format, a considerable number of core components of educators’ digital capability. Constant return to the DigCompEdu and TPACK frameworks ensured the focus stayed centred on the pedagogical value of developing modules. This process of seeking coherence & fit became increasingly important throughout the life-cycle of the project.

A further dimension to the work of comprehensively identifying teachers’ needs was approached by building an element of self-assessment into the reflective aspects of the prototype modules. The TET-SAT (Technology-Enhanced Teaching Self-Assessment Tool) developed as part of the work of the MENTEP (http://mentep.eun.org/) policy experiment was found to offer possibilities here. It provided some useful insight into how self-assessment could be directed at digital pedagogy, digital content use & production, digital communication & collaboration, and the more generic concerns of digital citizenship.

1.1.5 ITELab Module–ITELab MOOC connectivity; summary restatement

The original intention of both the Module and MOOC lead at EUN was to work for an alignment and to see if elements of both modes could be integrated. This proved too technically challenging for the Q1/2018 beta pilot as the development cycle

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3 The results from a recent consultation on the Framework are currently being evaluated by the ERC-IPTS in Seville. cf https://ec.europa.eu/eusurvey/runner/DigCompEduConsultation
was too tight. As a result, while there was general alignment noted during the beta pilot, testing of closer alignment was proposed for the Q2/2018 & Q1/2019 full-pilot.

Pedagogically both modules and MOOCs are based on engaging and informing learners in a challenging, participatory, and task-based manner. Thematically there seemed to be considerable potential for linkages – particularly around constructions of the networked teacher, on-line and cloud-based professional learning, and applied usage of relevant learning & teaching technologies in classroom settings. However, in terms of aligning module timeframes with those of the MOOCs the practicalities of alignment were seen as too challenging. Module activities required the inbuilt flexibility to allow them to operate in at least two timeframes – long (8 to 10 week), and shorter (intensive, 3 week blocks); the MOOC was by its nature intensive and tightly time-framed. The pedagogical character of MOOC activity and possible interaction with the much wider audience of the MOOC, was also seen as requiring further consideration.

Our initial assumption was that once the MOOC and Modules had been beta-tested we would be in a better position to identify possible linkages. Nevertheless, we proposed to seek out some initial linkages from the outset of the Q1/2018 pilot stage. To this end, we worked to align the design and material content of the initial Chapter of the ITELab MOOC Teaching in the 21st Century and the first unit of Teaching, Learning, & Professional Development in the Digital World - the initial ITELab Module offering, so that both ran in parallel in February/March, 2018. Our intention was to prime all interested module students for participation in the ITELab MOOC during Unit2; Wks. 5 and 6, and to build this into the materials and activity base of the module in order to demonstrate the potential learning opportunities offered by the connection to all concerned. (See D3.1 Section 3.)

1.2 Devising the ITELab Module Architecture; the underpinning ontology & design restated

1.2.1 Approach, purpose, and intention

As discussed in detail in the D3.1 Report Section 1 and as noted briefly above, the deeper purpose underlying the work on ITELab modules is not simply about the making of modules: it is to develop and trial a generative, flexible, and portable modular framework / architecture that embodies an innovative and creative approach to enhancing learning & pedagogy, and that does so in a way that generates more meaningful learning experiences for our student-teachers.

Much of the work of the ITELab project in general and particularly at UCD has been to identify and examine sources in the literature and in the practice-world of teacher education that can contribute to building this novel, module framework infused with a strong digital ontology and with pedagogical principles that reflect both the
challenges and opportunities of being student-teachers exploring more meaningful and effective technology enhanced classroom practice.

1.2.2 Authoritative / Defining sources; content, pedagogy and design

We have drawn to date on a number of sources that have proved definitional for the shape and direction of the emerging module framework.

This process has been discussed in depth in D3.1 Section 1 and the principal sources used have been identified.

In summary, the UCD team started with the ITELab Task 2.1: LITERATURE REVIEW⁴. This early scanning exercise provided the team with a valuable, widely-cast summary of published reports and case studies which document how training in the pedagogical use of ICT is currently covered within ITE curricula in Europe; and / or provide evidence of how student-teachers are currently introduced to using ICT.

We also drew heavily in the early stages on the work of the ShareTEC⁵ project.

ShareTEC was established originally to explore the construction of an advanced, brokerage service that might provide ‘personalised access’ for teacher educators to a wide range of digital contents for teacher education drawn into a single metadata indexed repository from resources available locally to the consortium partners. As part of its work programme ShareTEC developed an interesting protocol to allow indexing of other repositories in the field and, optionally, to add resources generated by practitioners outside the consortium.

Essentially, this semantic core powered a protocol which proved most valuable to the UCD team in terms of targeting content for inclusion in our prototype module. It comprised six separate but related ‘branches’ that are self-consistent in nature⁶:

- Digital Content (educational resources, communities, expertise, etc.). This branch represents the characteristics of artefacts closely related to the concept of “learning object” and offers a top-level discrimination technique for pedagogically related resources.
- Actors & Roles (people in the TE context and in the project system). This branch is aimed at capturing those characteristics of users (individual and groups) that support system adaptivity and in the ShareTEC context was seen as a possible source of recommendation around functionality.

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⁴ http://itelab.eun.org/research

⁵ Share.TEC - SHAring Digital RESources in the Teaching Education Community, eContentplus programme (ECP 2007 EDU 427015).

● Competencies (both at subject matter and at general levels [socio-affective, metacognitive, etc.]). This branch tried to combine two independent yet related hierarchies: competency and generic skill.

● Context (various contexts of action within the domain of teacher education). This branch represents the various contexts of action within the domain of Teacher Education, including in particular the teacher-practice context, which is aimed at capturing those organizational peculiarities in the various partners’ school systems as these impact on teacher education practices.

● Knowledge Domain. This branch of the ontology was developed to offer a vocabulary useful to represent the topics a given digital resource addresses, and the subject matter involved in any given competency act.

The third, and increasingly the defining source for the UCD work on ITELab module architecture, has been the emerging DigCompEDU frame from within the DG JRC Unit Human Capital and Employment of the European Commission in Seville.

We drew initially on a series of draft and discussion documents published by the JRC as the work of this policy-experimentation progressed. However, we were able to settle on the framework as the principal underlying source of both our ontology and design process with the publication of the DigCompEDU in its final form.

Essentially, DigCompEdu offers a scientifically sound background which proved extremely useful in helping us position the ITELab module frameworks in terms of potential learning outcomes and learner benefits.

An overview of the DigCompEdu main areas of focus and attention is included below at Figure 1.

FIGURE 1: DigCompEDU Arenas of Action


The DigCompEdu frame (DCE) is built around these six arenas of capability each of which is expressed in terms of specific competence and applications – with a total of 22 competences making up the full frame. These areas focus on different aspects of educators’ professional capability and activity. These are:

1. **Professional Engagement**: using digital technologies for communication, collaboration and professional development.
2. **Digital Resources**: sourcing, sharing and creating digital resources.
3. **Teaching & Learning**: Managing and orchestrating the use of digital technologies in teaching and learning.
4. **Assessment**: using digital technologies and strategies to enhance assessment.
5. **Empowering Learning**: using digital technologies to enhance inclusion, personalisation and learners’ active engagement.
6. **Facilitating Learners Digital Competence**: enabling learners to creatively and responsibly use digital technologies for information, communication, content creation, wellbeing, and problem solving.

In summary; the UCD team found the three sources summarised above and discussed in detail in the D3.1 Report Section 1, persuasive and useful. They offered sound and reasonable departure points for articulating our ITELab module framework and the pedagogical architecture that we wanted to embed in the modules as they developed. The ITELab Review and ShareTEC TEO matrix were particularly useful in this regard. All three sources also assisted in decision making around the task of framing an ITELab module; over time the DigCompEdu frame proved especially definitive here. The DigCompEdu allowed us to hardwire into design framework concerns for both the competencies / capability we were targeting, and a vision rooted firmly in the intersectionality of technology and knowledge-building in a 21st century school setting. It also provided a robust and well-articulated way to assist partners in their decision-making around which elements of the proposed modules would fit best with their own institutional practices and the local needs of their students.

### 1.2.3 Concluding comment

The ITELab module architecture and its embedded design process have been summarised above. A full discussion of the origins and sources of the ITELab module ontological and design features was offered previously in **D3.1 Report, Section 1**. This pointed to the authoritative sources used to inform the design & testing work as it developed and key characteristics of the emerging approach.

The ITELab Module architecture and generation of the project modules remains a work in progress across the life of the project. Our activities have continued to

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8 From the final report of the DigCompEdu Project: *European Framework for the Digital Competence of Educators; DigCompEdu*, Redecker, C and Punie, Y (eds) EUR28775 EN.
incorporate concerns for the following key characteristics of the modules, as they develop: well-integrated pedagogical approaches; principles relating to learning design; concern for open access; the provision of guidance & support to ITELab colleagues running a pilot module; content and activities that are customized from existing resources within the project partnership rather than developed from scratch; inbuilt opportunity for reflection & demonstration as a defining feature of module assessment; an approach that foster communication & collaboration opportunities within and across ITELab partner universities offering all elements or selected aspects of the modules, across the full run of the project and beyond.

1.3 MODULE DEVELOPMENT

1.3.1 From inception to co-design and full-test

The development of ITELab module materials and practices as specified in WP3 T3.1 and T3.2 has been staged over the life of the project, with blocks of preliminary work and provisional materials being collated and brought by the UCD ITELab team to the full project community for discussion and recalibration at a series of planned meetings and events.

The first of these formative discussions took place at an online meeting in Sept 2017 at which three modules in basic /outline form were presented for consideration. (Figure 2 below.) We fully expected that these initial areas would evolve to include new possibilities as the design process continued and partners became more familiar with the outline structures and possibilities of the modules and increasingly involved in (re)shaping them. The working-titles for the proposed modules were:

A. Teaching, Learning, & Professional Development in the Digital World.

B. Designing for Learning in a digital world.

C. Effective Use of Space & Technology in digital learning settings.

Valuable comments on the design approach and on the content and sequencing of the emerging modules were received on the day and further refined as more feedback arrived from a number of the university partners in mid- to late-September. Much of this commentary was incorporated into both thinking on the module development process generally and the framing of the initial test module. Following these discussions with partners and members of the original project design team, pedagogical value (in terms of easy & immediate deployment of learning from the module in the practice setting) was added to the design approach as a guiding element of the vision for ITELab modules.

The UCD ITELab team continued this pattern of constant, open and responsive conversation with all partners throughout the development and subsequent refining of all module related materials and activities. This, we suggest, became one of the
real strengths of the project over time. An outline of the event-series that anchored the project’s co-development work practice can be found at Table 1 below.

Once the ITELab University-Industry Forum started its work, this conversation became more layered and sharper in focus as the partnership worked in detail through a number of issues relating to expectations and possibilities for cooperation and collaboration specified in the forum work [D 3.7/ T3.3]. This included issues to do with open-access to project materials, sources from which to collate and curate appropriate ideas and materials, competence and capability building at local levels for project partners, and the voice of student teachers. The value of this was considerable and its impact was regularly noted at partnership meetings and events. It was also commended in the ITELab project–Independent Evaluation Report 2018 (MDM Consultancy bvba, 2019).

Figure 2: Focus Areas and Topics of ITELab Module, v1.

For the Q1/2018 beta-pilot we focused on Module A above to bring it to pilot as a 5 ECTS, Level 3 offering. This was aligned with the DigCompEDU and mapped to CEFR A2 Explorer capabilities, as recommended by that framework. As agreed with the project partners this was a ‘closed’ trial – i.e. involving ITELab university partners only (UCD, UoA, UoN, UoP, PolyIS).
Modules B and C were subsequently designed and resourced as possible 3 ECTS offerings, and mapped to the more demanding CEFR B1 Integrator capabilities. Most of the work on these modules followed the seminal ITElab Partners Workshop in June 2018. They were consequently different in form and approach to the earlier materials and benefitted considerably from the cycle 1 test stage.

In line with the decisions made at this workshop, draft materials for Modules B and C and a significantly revised version of the Module A were completed over the summer months [M18-M20]. This was possible because ITELab’s industry partners now had the infrastructure and people in place to contribute significantly to the framework development and the UCD team were able to work with the revised arrangement. A description of this extended process is offered at 1.3.4 below.

Although not in the original design scheme, a second cycle of testing was completed in autumn 2018 for the module A framework and a preliminary test of module B [M21-M24]. This proved extremely valuable and informed the finalisation of all module frameworks for the full-pilot stage in Q1/Q2 2019 [M25-M30]. This is discussed further at 1.3.5 below.

A full suite of collated materials, pedagogical ideas, and other relevant resources was published out of this development and testing process. These included consolidated reference handbooks for the frameworks and week-on-week guidance for leading learning through the ITElab materials. These can be accessed at the ITElab Staff Hub – a freely available on-line ‘home’ and repository for ITElab material and resources; see here.

1.3.2 Module Design Work schedule

The initial development schedule we adopted was as follows:

- October 2017 – preliminary development of generic module framework & Module A prototype; including briefing of Pedagogical Advisory Board.
- November 2017 – review and refine module in close liaison with project partners; stress-test at EMINENT 2017.
- January 2018 – Finalise module, liaise with piloting universities re timeframe and mode ahead of late January launch (w/b 22 January 2018).
- June 2018 – Formal Review of beta pilot to include student teacher focus group (Brussels) and project partner meeting – evaluation, feedback, commence module development for Q1/2019 full pilot.

Following the ITElab Workshop and Project Partner Meetings of June 2018, the next stages of development and resourcing were laid out as follows:

- July-September 2018 – intensive co-development work on module B and C prototype frameworks & remodelling of module A in light of workshop
recommendations, independent evaluator’s suggestions, and input from the ITELab Pedagogical Advisory Board.


- October–November 2018 – systematic incorporation into the frameworks of student teacher voiced suggestions and recommendations, from the June Workshop [M18] and from the two student-teacher focused sessions of the ITELab University-Industry Forum.

- December 2018 – full project community review and finalisation of all framework module materials at EMINENT 2018.

- January-May 2019 – full-pilot of ITELab module frameworks involving project university partners and a number of associate partners:
  - January-May 2019, Teaching, Learning and Professional Development for Beginning / Student Teachers; module A framework. UCD, Perugia, Santerem, Agder, Microsoft IRL, IRIS Connect, SMART Technologies; MIE Dublin, Kazan.
  - January-March 2019 – Designing for Learning; module B framework. UCD.
  - April-May 2019 – Working with Learners; module C framework. UCD, Microsoft IRL, IRIS Connect; MIE Dublin.

- June 2019 – Formal Review of full pilot to include student teacher focus group (Brussels) and Full Project Partner Meeting – evaluation, feedback, planning for validation exercise, lesson-learning, and sustainability.


A number of observations on the evolution of the Module Design Work schedule need to be made at this point: First, as noted previously, the schedule was always intended to be a flexible guidance mechanism rather than a prescriptive set of dates and deadlines. In this it proved a valuable way of giving focus to the work of the partnership when taken in conjunction with the regular Project Partner meetings and the various project related events that helped regulate the activities of the ITELab. The flexibility of the schedule was particularly useful in that it allowed us to respond to the issues and concerns raised across the partnership in regard the timing, intentions and underpinning assumptions of the work. For example, when it became evident that despite our initial conversations and agreement around the classroom-focused nature of the module activities and level of competence that could be expected of participating student teachers, we needed to re-think and reposition parts of the test materials, the design work schedule readily facilitated this. Second, the design leadership initially provided by the UCD ITELab team gradually and seamlessly evolved into a distributed model – particularly after the June 2018 discussions – which allowed ITELab industry partners to become more active in this.
area of the project. This offered considerable benefit to the work and resulted in some valuable learning about collaboration at this level.

A chronology of major /key-moments in the co-design, development and testing of the ITELab module frameworks is offered in the table below. Following this, each stage of the project work to date is described in summary form:

<table>
<thead>
<tr>
<th>Co-design</th>
<th>Testing</th>
<th>Feedback/ Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spring/Autumn 2017</strong>&lt;br&gt;Co-design with all partners: module A, Training, Learning, &amp; Professional Development in the Digital Age.</td>
<td>Cycle 1: Spring 2018&lt;br&gt;All partner universities: UCD, UoP, UoN, IPS, UoA</td>
<td>Key learning points:&lt;br&gt;Working well: inter-active, task-based nature of work; shared handbook; value of DCE framework; international collaboration; student input to redesign.&lt;br&gt;Need to Rethink: level of pitch; practicalities of synchronous sessions; constraints amongst different partners; assessment time to plan in.&lt;br&gt;Reposition: Module A CEFR A2 Explorer; Modules B &amp; C, B1 Integrator. Ref UWU Evaluation Report: student focus group, partner focus group, survey feedback. <a href="#">here</a></td>
</tr>
<tr>
<td><strong>Summer/Autumn 2018</strong>&lt;br&gt;Update: module A&lt;br&gt;Co-design with academic partners and Steelcase and SMART Technologies: module B, Designing for Learning in a Digital World.</td>
<td>Cycle 1a: Autumn 2018&lt;br&gt;UCD trial update module A and initial test module B. Implementation planning and briefings with partner universities and new associate partner universities.</td>
<td>Key Learning Points:&lt;br&gt;Module A working as baseline. Module B learning scenarios leveraging good industry examples.&lt;br&gt;University institutional and implementation constraints mean shift towards more flexible module frameworks to review and absorb parts in existing university courses linking to local assessment and credits.&lt;br&gt;Supporting Staff Hub, with handbooks and briefings, valued by universities. Resonance with research by UoA on teacher educator competences.</td>
</tr>
<tr>
<td><strong>Autumn/Spring 2019</strong>&lt;br&gt;Final project version: module A framework Update: module B framework&lt;br&gt;Co-design with Microsoft and IRIS Connect: module C, Working with Learners.</td>
<td>Cycle 2: Spring 2019&lt;br&gt;UCD lead all modules. All partner universities joined by new, interested universities.</td>
<td>Different implementation models emerging: module selection (all, parts); module progression with student teachers (cycle 1_mod A, progress to cycle 2_mod B); student teacher advocates showing high interest in industry education content and pathways e.g. MIE, IRIS badges.&lt;br&gt;University term and timetabling constraints preventing co-teaching.&lt;br&gt;Evaluation on-going: UWU Evaluation Report, to be published December 2019.</td>
</tr>
<tr>
<td><strong>Summer/Autumn 2019</strong>&lt;br&gt;Final project versions: module frameworks A, B, C</td>
<td>Cycle 3: Autumn 2019&lt;br&gt;UCD, partner universities, new universities.</td>
<td>Flexible implementation options. Trial of pre-selected date(s) to share teaching approaches and learning across teacher educators.&lt;br&gt;Final evaluation report: UWU, December 2019. Final Recs and resources report: UCD, Jan 2020</td>
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Table 1; Co-designing, developing, and testing the ITElab frameworks: a summary
1.3.3 Focus of Activity and Input by Project Partners; May2017-Dec2017 [M5-M12]

Work on module content and development benefited greatly from the discussions and interactions that took place at the ITELab Project Partner Workshop –29-30 May 2017 in Brussels and through a follow-up meeting in Dublin on 13 June 2017 involving the Project Director and Project Leads on the ITELab Modules and ITELab MOOC. This was further developed through the ITELab Project Partner Online Meeting –26 Sept, and the Project Partner Workshop at EMINENT 2017 – 16 Nov 2017.

A number of key parameters established by the partners in the initial discussion were affirmed at these various project partner meetings. These reflect the core values and underpinning vision of the ITELab module, as envisaged by the partnership. They comprise: the need to build and retain a vision for meaningful use at the heart of all that we do in this project; the need to keep the use of digital tools to enhance & innovate learning at the centre of the project; the centrality of opportunities for active-learning and self-efficacy in the development of competence and digital capability building, and the centrality of this to the learning architecture of any proposed module. In addition, the systemic scale of the challenge faced by the Project was reaffirmed, as was the need for closer coordination of the project partners and the involvement of the Pedagogical Board and the growing number of Project Associates in the progressing of project content & vision, generally.

1.3.4 Focus of Activity and input by Project Partners; Jan2018-Aug2018 [M13-M20]

The beta-test of the initial module materials took place in the spring of 2018. During this, frequent conversations and interactions around coordination took place between the UCD team and the university partners as well as with the MOOC lead and the project coordinator. These focussed on both content and logistical issues: for instance, the timings of offerings, the readiness and suitability of proposed materials and activities, aligning for shared-teaching activities, and clarification of the proposed assignment process and structures.

Learning from the beta test was subsequently built into both the Module A framework and into design work on the other modules. As noted earlier in this Report, this came primarily from the ITELab Development Workshop in June 2018 [M18] and from the initial evaluations of the modules presented in Course Module Evaluation Report 1 D5.2 provided by the University of Würzburg – ITELab evaluation partner. Commentary from the Independent Evaluator also helped with this, in due course - ITELab project–Independent Evaluation Report 2018 (MDM Consultancy bvba, 2019).

A number of specific features of the module required rethinking in light of the beta-test. Two in particular required considerable re-tracking: the intention to included extensive live-to-air interaction across the partnership as an integral element of the work, and the undifferentiated nature of the initial offering along teaching-phase related lines. Live-to-air activities were scaled-back considerably for the next round of testing and a primary / secondary differential was introduced at the specific request of a number of university partners.
The live-to-air aspect of the work, while enjoyable, was found to be unexpectedly problematic to schedule in part because the timing of the beta-test run proved less than ideal. Institutionally, most of the partners were already locked into teaching locations and schedules for the semester / term and had little if any flexibility around additional programming. Finding locations / facilities to participate in the exchanges was difficult. In addition, most student participants in the partner institutions were already well advanced into their courses of study and / or practice placements and found it challenging to free-up voluntary time to participate in testing the module materials. Indeed, many were reluctant to do so.

Similarly, the projects intentions around providing module activities that fitted to both primary and secondary teacher education contexts proved too optimistic. The difficulty that emerged was not around quality and focus, interestingly, it was around opportunity to practice and use module content in a teaching placement setting – which formed an integral part of the module assessment structures, as originally devised. At the online meeting of the partnership in Dec2018, it was decided therefore to offer Module A along two streams – one predominantly primary in focus and the other predominantly secondary. This was to facilitate two features of the partnership’s practice more effectively; as noted immediately above, primary colleagues found they had considerably less (or no) opportunity to site-test the activities and materials being explored through the module – their placement structures for practice did not match those of secondary colleagues; nor would they in the full pilot stage. This meant that while the broad base of materials and activities worked for both types of institutional group, there was less opportunity to ‘road-test’ on the primary side. In contrast, live-to-air sessions were easier to execute on the primary side as they had considerably more ‘university time’ than secondary side colleagues.

The additional module frameworks were altered also to reflect these concerns but in internal ways rather than along streams. More opportunities for asynchronous connections were built into the revisions to Module A and from the outset into one of the new modules – the partnership decided to test, in principle, a more intense but differently scheduled form of co-teaching and shared activity as part of the other.

The idea and nature of ITELab Course Handbooks was also revised as part of the learning from the beta pilot. Module A materials and activities were repackaged to better reflect the primary / secondary concerns of the partners and work on handbooks for the other module frameworks was prioritised, ahead of the proposed full pilot in Q1/2019.

1.3.5 Focus of Activity and input by Project Partners; Sept2018-Dec2018 [M21-M24]

During this semester the UCD ITELab team continued to consolidate the materials and activity base for the full-pilot of the module frameworks. Working closely with the three industry partners, we identified and curated extensively – to the point that we had more than sufficient to resource all three modules in their ‘final’ pre-pilot form.

The Module A framework was retitled; Teaching, Learning and Professional Development for Student & Beginning Teachers, and resourced along two tracks –
primary student teacher and secondary student teacher. Activities based on the IRIS Connect ‘Film Club’ approach to competency development was build into each as a block of two / three session engagement. Additionally, the IRIS partners developed a short on-line induction to support this and a mini-webinar was designed to introduce and support the student activity in this area. Additionally, the linkages to specific DigCompEDU statements were revised to ensure more clarity and visibility to the partner leading framework activities at each partner ITE institution – a point reflected in the reviewing of all statements and a more readable inclusion of these at the end of each guidance note. Specifically, all DigCompEDU competency listings such as DigCompEDU 1:1, 2:1 etc were replaced by readable alternatives such as Capability building /DigCompEdu focus: 1:2 Professional Collaboration, 2:1 Selecting Digital Resources, and so on. Framework A Live-to-air sessions were scheduled separately for primary and secondary university partners so that these were more in line with semester schemes of work / teaching placements. Once again, however, the seemingly simple act of aligning synchronous spaces that allowed the partnership to collaborate in real time proved challenging. The UCD Team also decided to recommend a slightly shorter run-time of ten weeks for the Teaching, Learning and Professional Development for Student & Beginning Teachers framework for the full-pilot in the spring and so tested this idea in an additional test-run in Q3/2018. It held up well.

Module B framework materials were brought together under the revised title of Designing for Learning. On the basis of the workshop discussions in June, this framework was set to 3ECTS Level 4 equivalency and with the help of content and concepts from SMART Technologies professional community suites, it proved possible to design a resource that could be taken and used by either primary teacher educators or secondary. The run-time for this framework was set at 6 weeks. Like the more extensive module A resources, this was tested in an additional run in Q3/2018.

Module C framework resources were finalised for full-pilot under the title of Working with Learners. In a number of ways, the collation and compilation of this framework brought to the fore the strengths of the ITELab partnership and our growing ability to work together in an open and constructive manner that could be said to validate the entire ITELab concept. All three industry partners fed ideas and materials into the framework with Microsoft and UCD taking a lead role in the identification of blocks of materials that could be taken from behind paywalls by both IRIS and Microsoft to produce the third ITELab module framework, and characterise it differently from the other two module frameworks.

Two elements that were designed into Working with Learners contributed to this: the manner in which the materials would be used over a series of evening and weekend ‘blocks’ – intensive, linked, longer sessions of up to three hours duration – rather than in the more typical academic week-on-week format that underpinned the other ITELab modules; and secondly the deliberate association of framework activities with possible badges and certification provided by the industry partners – specifically, an IRIS Connect Participation Certificate and a set of Microsoft Innovative Educator (MIE) badges associated with progress towards MIE Expert. In combination, these defined a very different set of learning possibilities in terms of the learning journey.
However, by constantly checking and referencing against the DigCompEDU listings we were able to ensure comparable quality and standards across all three. Additionally, by taking into consideration the rich detail emerging from the ongoing casestudy element of the ITElab work (which opened up valuable insights into previously poorly understood elements of the technical and pedagogical practices of the university ITE partners) we were able to build into Working with Learners a series of possibilities for co-teaching and collaboration closer to the original vision of the ITELab project. This work was completed in time for the planned full-pilot of Q1/2019.

1.3.6 Focus of Activity and input by Project Partners; Jan2019-Jun2019 [M25-M30]

The ITELab module full-pilot for frameworks and resources for Module A, Module B and Module C took place in Q1/Q2 2019 [M25-M29]. All of the university partners participated in this on a scale reflecting availability and interest among their students. Additionally, a number of associate partners tested-out discrete elements of the project materials when the opportunity was made available to them. Among these, Marino Institute of Education, Dublin Ireland and Kazan Pedagogical Institute, Kazan were notable and engaged widely.

Teaching, Learning and Professional Development for Beginning Teachers (the Module A framework) ran in both primary and secondary streams over the full semester, with a break for Easter towards the later stages of the run. It involved all ITELab academic partners and a number of associates. Designing for Learning (the Module B framework) was piloted locally at UCD but without any other academic partners. The full-pilot of the block-based version of Working with Learners Module C took place in May 2019. This involved all partners – academic and industry – to a considerable degree.

As mentioned earlier a number of innovations marked the Working with Learners pilot; these included the ‘block’ nature of the timings and the deliberate association of framework activities with badges and certification from the industry partners. The activity was also hosted in a non-academic setting. Microsoft Ireland kindly made its DreamSpace facility available for the activities; UCD student teachers travelled to the Microsoft facility for two Monday highly intensive evening sessions and two full Saturdays. Teaching was shared by UCD ITELab team members, IRIS Connect and Microsoft education staff. A number of the ITELab local coordinators along with the Project Coordinator and the MOOC lead travelled to Dublin to participate in Working with Learners activity on the last Saturday in the block. Colleagues from IRIS Connect and Microsoft as well as UCD Team taught into the day.

A short video capturing the final day’s events for Working with Learners can be accessed here: https://bit.ly/2LkD8Jq

At the end of this Working with Learners series, all the participants qualified for MIE standing and for the IRIS Connect certificate. On the technical side, we were also able to test out the possibilities of Microsoft Teams as a medium for sharing opportunities for ‘real time’ participation in framework activities. This raised some fascinating possibilities for future work.
Formal evaluation and monitoring of the full-pilot was lead by the project’s evaluation partner – University of Wurzburg – and supplemented by internal evaluations and student feedback to individual partners at the local level. Additionally, project partner meeting over the spring served as opportunities to update all involved and respond to individual and group observations.

The extended Second ITELab Workshop and Project Partners Meeting over three days in June 2019 provided the perfect opportunity to bring all of this learning together and to fundamentally reappraise both our original assumptions and the present direction of travel of the project. It also allowed for a deep engagement with student participants from the beta and full pilot.

A number of significant insights emerged from this event:

- The ITE students participating in the workshop – drawn from across the partnership – affirmed the value of ITELab activities. They argued persuasively for continuity in our direction of travel but also for change in relation to the more theorised aspects of the work. In short, they agreed with the need to engage the deeper questions the project raised about the ownership and usage of technology in education settings but also felt strongly that there needed to be a recognition across the modules that there is a much broader scale of technical and pedagogical ability present among participants that the project seemed to recognise.

- Although the ITELab industry partners were active in the partnership meetings and contributed to the design stages in a very full way, more opportunities were needed to bring industry partner expertise and materials to the fore in regard to the module content and activities. Additionally, a number of industry partners wanted to deepen their personal involvement in the instructional side of the project and ways needed to be found to facilitate this.

- The assumptions behind the thematic focus of the ‘modules’ and even the nature of these as a meaningful basis for institutional partners (both main and associate) to work from needed further thought. The early evaluations and discussion at the workshop indicated that much more loosely-coupled sets of materials and shorter, supporting activities could provide better options for the partners. This would allow for considerably more flexibility in selecting from ITELab’s suites of content, suggested activities and possible assessment structures than the more rigid and interlocked type of module the project partners initially assuming we would need to develop.
1.4 **Support for Local Testing of ITELab Materials**

The UCD team provided Module Guidance Notes to all local organisers in the partner institutions to help guide the way through the beta pilot. The practice of offering a pre-module webinar for participating project staff in the weeks prior to launch was also initiated. This was opened to associates also who might want to observe as part of the beta-run. The parts of the module that addressed the use of video for personalised and collaborative professional learning were resourced directly by IRIS CONNECT. Plans to provide an offline version of the MENTEP TET-SAT tool to assist staff in placing themselves in relation to the proposed work of the project ran into technical difficulties and so during the pilot stage it was left to individual project partners to decide whether and how to assist leading staff to become familiar with the idea of digital self-assessment and to help student-teacher participants to identify their technical and pedagogical competence and needs.

**Module Handbooks** were developed at UCD to support the teaching of ITELab content for the full pilot in Q1/2019. These were sent to institutional leads in digital form ahead of the launch webinars for the spring run. In line with the obligations entered into under WP3 T3.1 and T3.2, the material was also published in open access form at the [ITELab Staff Hub](https://itelab.wordpress.com/) with translations added to other partner languages as these become available. ‘Handbooks’ is however not really a fully adequate term for these. Following the work put by the three ITELab industry partners into bringing their expertise and materials to the fore in regard to the module content and activities, it is more accurate to describe them as **resourced module frameworks** that allow participants to select confidently from suites of materials and activities assembled to address specific thematic areas of better ICT usage among student teachers. Examples of this type of material include the ITELab portal and certification line developed by IRIS Connect, the SMART Technologies Learning Pathways resources, and the Microsoft IRL ITELab specific Microsoft Innovative Educator package made available through the *Designing Learning* (ModC) framework. The iterative nature of web publication meant also that the materials could be adjusted, supplemented, and/or replaced, as necessary to offer better support for local leads.

Another feature of manner ITELab industry partners worked together closely and productively can be seen in the way that Microsoft and SMART Technologies led in Q3/Q4 2018 on collating materials from across the partnership with particular relevance to the theme and content areas of the Module B Framework – now titled *Designing Learning*. Approximately forty individual items were eventually collated on the Microsoft OneNote site. These came from all of the industry partners and while some needed work to reconfigure in line with ITELab structures and expectations, on the whole the materials provided a very valuable backbone for the module. IRIS Connect similarly assembled a bank of materials to support aspects of Module Framework A – retitled for the full pilot as *Teaching, Learning, and Professional Development for Student/Beginning Teachers* and for the proposed Module Framework C – refocussed and retitled *Working with Learners*. Usual IRIS Connect restrictions on these were removed to allow full and open access to ITELab materials.
participants. This built on learning from the beta-test of ITELab module A, which included both IRIS Connect Film Club materials and access to the IRIS Connect Online Collaborative Environment. The revised materials streamlined the access side of this and opened up possibilities around using the materials in a less context dependent way in order to facilitate primary ITELab partners work with the materials. Materials and resources from SMART Technologies\footnote{https://education.smarttech.com/en/products/smart-learning-suite} were also made available to this growing collection.

Work on collating and ‘tagging’ these materials and suggested supporting activities took place primarily in the summer of 2018 and the outcomes were in place for both the second run of \textit{Teaching, Learning, and Professional Development for Beginning Teachers} (Module A framework) in Q4/2018 and the subsequent full pilot in Q1/2019 of both \textit{Teaching, Learning, and Professional Development for Beginning Teachers} and \textit{Designing Learning} (Module B framework).

1.5 ITELab Student Learning Hub and Facebook Page

In parallel with work on the ITELab Staff Hub we also designed and built an ITELab Student Hub over the duration of the beta and full pilots. This proved more demanding than originally envisioned. In part, the difficulty arose from unexpected issues regarding student contact and privacy emanating from the introduction of the 2018 European \textit{General Data Protection Regulation} (GDPR). However, there was also an unexpected degree of hesitancy on the part of participants to share their emerging learning publicly. Systematic attention was paid to this in the recent Q3/2018 additional pilot, with some success. However, there is still considerable work to do to maximise the value of this and similar web portals. This will be given particular attention as part of a proposed validation exercise relating to the frameworks in Q4/2019.

Essentially, when fully operational the student hub will act as a virtual community where student participants in ITELab module activity can interact with each other in an open and welcoming setting. Our intention remains that the hub will offer an online space which can meet learners’ needs for a project-wide platform. We see it functioning both as a social and a professional learning communicate and believe it has the potential to offer a mix of resources, and interaction spaces.

Initially, within the project partnership we also envisioned the ITELab Student Hub playing an important function in capturing the student voice in an unobtrusive and authentic manner. However, on an initiative which had its origin among the student participants themselves, an ITELab Student Facebook Page has started to fill this role. We propose therefore to further develop this resource as part of the final stage validation exercise and to test the possibilities of this medium in a more systematic manner.
2 INTERIM RECOMMENDATIONS

In this short final section of the current report, a number of interim recommendations are offered on the basis of work to date on the development of the ITElab module architecture and the resourcing and testing of the ITElab module frameworks.

The recommendations below should be read in conjunction with those offered in D3.1 Sec 2 (Dec2018). Both sets are interim in the sense that they will be more fully developed in the final report in this series (D3.3, due in December 2019).

Those below are firmly anchored in the project tasks at UCD and draw on lessons learnt since the publication of the D3.1 Report through working with all ITElab partners and on the experience of what we have gained as a partnership bringing together industry, ITE universities, and student teacher participants.

2.1 ITE PROVIDERS: WORKING WITH COMPANY CPD RESOURCES AND TEACHER COMMUNITIES

The design and resourcing of the ITElab module frameworks in year two of the project provided opportunities for the full project partnership to work closely together to leverage both academic and industry repositories of content and to develop ways of supporting ITElab activities that added considerably to the value of both the new modules and also enhanced the quality of the reworked Module Framework A offering. What follows are some interim recommendations drawn from the practical, technological and pedagogical experiences of beta-testing and full-piloting the three ITElab module frameworks, much of which has been considered earlier in this report.

2.1.1 INTERIM RECOMMENDATIONS FOR ITE PROVIDERS

2.1.1.1 Supporting change and Innovation in ITE

We recommend that HEIs with an interest in instantiating better technology usage in initial teacher education programmes need to consider the advantages of working closely with schools, industry and the student teachers themselves to identify more precisely the nature and range of usages that student teachers will require in their early years as teachers, and then work together to address these.

The experience of the ITElab project in relation to this is that the context of present and near-future student teacher practice is essentially determined by a mix of local and personal factors. While HEIs can provide education in valuable pedagogical guidance and mindset and industry can offer a considerable range of technical and developmental insights and competencies, it is when these are adequately and appropriately combined within the lived context of a school that innovative practice can result. Much of the learning that characterises what we have been able to achieve in ITElab depends fundamentally on addressing this mix of factors with
partners bringing different but complementary capabilities and interests to the problem, and doing so collaboratively.

2.1.1.2 Understanding and leveraging more of the breadth of what companies have to offer

We suggest that universities and colleges would benefit from engaging more with industry on the range of ways that industry partners can add value to and supplement the work of HEI staff in helping student teachers make better use of stock technology.

One of the most valuable insights emerging from the ITELab project is the range of ways in which the industry partners can and are willing to contribute to the process of educating new / student teachers. While acknowledging that the three ITELab industry partners are field-leaders and pioneers in their own arenas, it has been heartening and instructional to see how they are willing to give access to resource bases, offer pathways to customised certification, and open access to their specific communities of teachers. As academic / university partners we have seen the benefits of this throughout the second year of the project particularly as trust grew across the partnership.

2.1.1.3 Actively helping shape product and services development in companies

We are of the view that a powerful educative balance can be struck when academic and industry partners work collaboratively to co-design learning frameworks for student teachers but that there is nothing automatic or guaranteed in this arrangement – all parties need to work constantly on the character of the partnership, with the university partner bringing the necessary moral, pedagogical and educational perspective to this conversation.

Being involved in ITELab has more than confirmed for all of us involved that industry and companies in the education service area have considerable strengths to bring to a learning partnership; these include particular understandings of the potentials and possibilities of specific learning-related products, tools, and technologies. When mediated by concerns for what is feasible and reasonable to expect of a young teacher in formation – as understood and presented by academic partners in a project – this can be a powerful thing. However, it is important that this line is always held as student teachers are otherwise open to unreasonable demands about ‘necessary’ usage and the unassailable possibilities of technology. In a strong reading of this Zuboff (2019) suggests simple acquiescence to new digital technologies is detrimental to all our futures and forecloses rather than fosters future possibilities.
2.2 CLOSING COMMENTARY

At the conclusion of the D3.1 Report (December 2018) it was noted that recommendations and observations presented were tentative and offered in anticipation of the completion of the development and testing of the ITELab modules. That process is now complete and we are pleased to note at this point that both beta-test and full pilot have been productive and generative learning experiences.

The discussions started in D3.1 and continued above in the present D.2 Report however remain somewhat unfinished. What ITELab has achieved in relation to the quality, impacts and relevance is not in doubt – the experience has to date been challenging and beneficial.

A number of factors combine to make this a work in progress, still. Among these has been the decision to test and retest our materials far more extensively than was originally envisaged. Instead of a beta- and one full-pilot, we found it feasible and advantageous to test through at least three cycles, and to focus on differing constructions and schedules. The net result has been a considerably greater volume of assessment data, and a much richer learning experience for us all.

What started as a standard centrally-led, design-and-test brief has evolved into an unexpectedly intensive experimentation in the praxis of co-design and distributed leadership across the full ITELab partnership.

There is a considerable amount of work still to do in closing out the ITELab project over the coming months, and ahead of the final D3.3 Report. Our emphasis at this point is not only on finalising the documentation of the work on developing the three ITELab frameworks, it is also on disseminating and initial exploitation of the learning that has taken place and making use of this to bring value to the way education technologies are used, taught, and integrated into the work of initial teacher education, in ITELab partner institutions and beyond.


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