Assessing practitioner e-maturity: Developing a benchmarking tool to measure practitioner ICT capability in Further Education

Pilot study report

Foreword and note of thanks

Becta is the UK agency responsible for developing and supporting the national strategy for technology in education, and the Further Education Directorate leads within Becta on Further Education (FE) and Skills, a sector that covers 350 further education colleges and an even larger number of private training providers, involving over 200,000 staff working in teaching and training roles.

Earlier in 2010 we published *Next Generation Learning: The implementation plan for 2010-2013*, setting out priorities, key actions and targets to support use of ICT in the FE and Skills sector from 2010 to 2013. The plan is structured under the four themes of efficiencies and effectiveness, sector leadership and workforce, content and digital resources, and communications and networks.

The leadership and workforce theme highlights the national requirement to *increase the number of colleges and providers using technology effectively*. As part of our efforts under this key action we decided to establish an evidence base showing how teaching staff in English Further Education colleges assess themselves in comparison to similar professionals elsewhere in Europe. The resulting international benchmarking study, based on the perspectives of over 2000 teachers in five European countries, is the first study of its kind for our sector.

The report presents evidence in a form that will be useful to practitioners, institutional leaders, and policy makers, drawing out some practical comparisons between the five countries that took part in the study, within an easily understood framework.

Whilst there are inherent difficulties in making international comparisons of the kind presented in this study, especially in a highly variable and diverse sector like FE and Skills, I have no doubt that the evidence summarised here, and the analytical framework upon which it is based, will be of value both in the UK and internationally.

Work of this kind would be impossible without the support of our international partners. Becta's thanks are therefore due to the following individuals and organisations, who, led by Serge Ravet at the Paris-based European Institute for E-Learning (EIfEL), were responsible for the internationalisation of the benchmarking instrument, the collection of data, and the provision of country-level commentaries. Our thanks are also extended to Sero Consulting Limited who co-ordinated the project and conducted this research on behalf of Becta.

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Denmark: Mona Schulz, Syddansk Erhvervsskole
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Executive summary

Purpose and scope

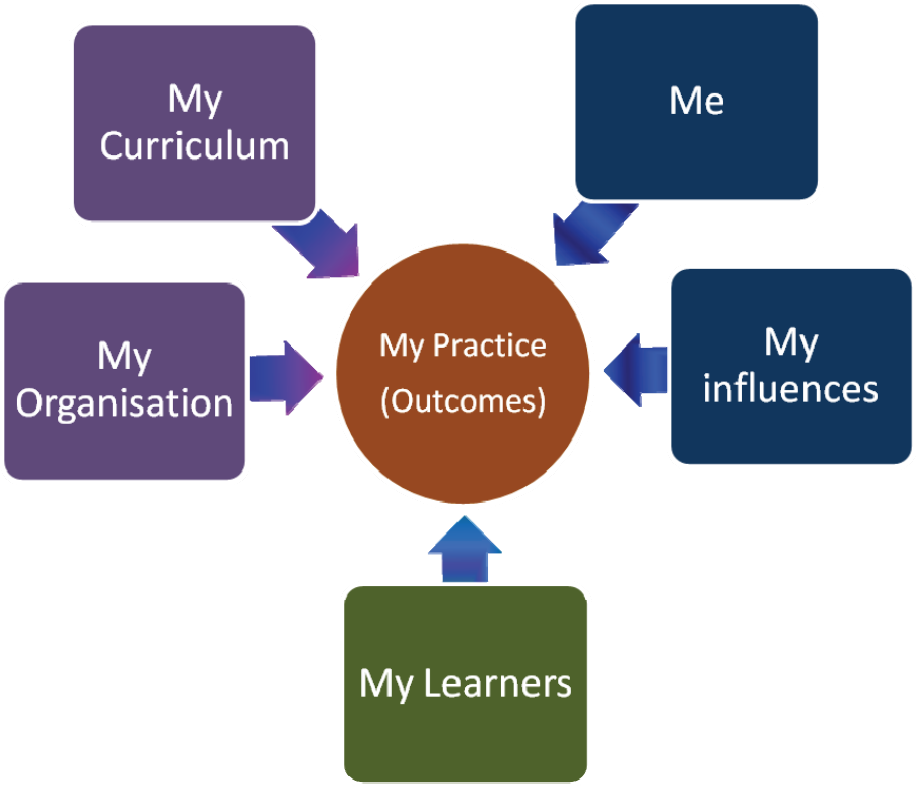
The International Benchmarking Project was commissioned by Becta to help explore how teaching staff in further education colleges perceive their skills and use of technology for teaching and learning, the extent to which these assessments are shared with staff in similar circumstances working in other countries and how these assessments can be used to assist institutions in the sector to make more efficient and effective use of technology to provide improved outcomes for learners. By involving partners from other countries, it was hoped to identify issues that are common across national systems as well as the differences in use and practice that emerge from different educational policies and organisational structures. For Becta and partners this initial trial phase of the project was designed to support learning about practitioner perceptions and the implications for their organisations and test the methodology.

The survey instrument was based on experience gained in the annual surveys of managers and practitioners in English colleges, and drew on international work including UNESCO standards on the use of technology for learning and teaching. This survey focused on teaching staff in general further education institutions. Data was collected from English FE Colleges and from four other European tertiary systems: Austria, Denmark, Portugal and Sweden.

The online survey instrument was designed to map teachers' confidence in using ICT within a framework of six themes:

- **Me** - What can I do with ICT and how do I acquire and update those skills?
- **My influences** - To what extent is my use of ICT shaped by my colleagues or by external influences?
- **My learners** - What ICT skills do my learners possess and what expectations do they have of using them in their learning?
- **My curriculum** - To what extent do the curriculum content and the assessment regime allow me to use ICT?
- **My organisation** - What does my organisation require me to do with ICT and what developments does it encourage?
- **The outcomes** - Does ICT have a beneficial impact on my work as a teacher? Does ICT have a beneficial impact on the results of my learners?

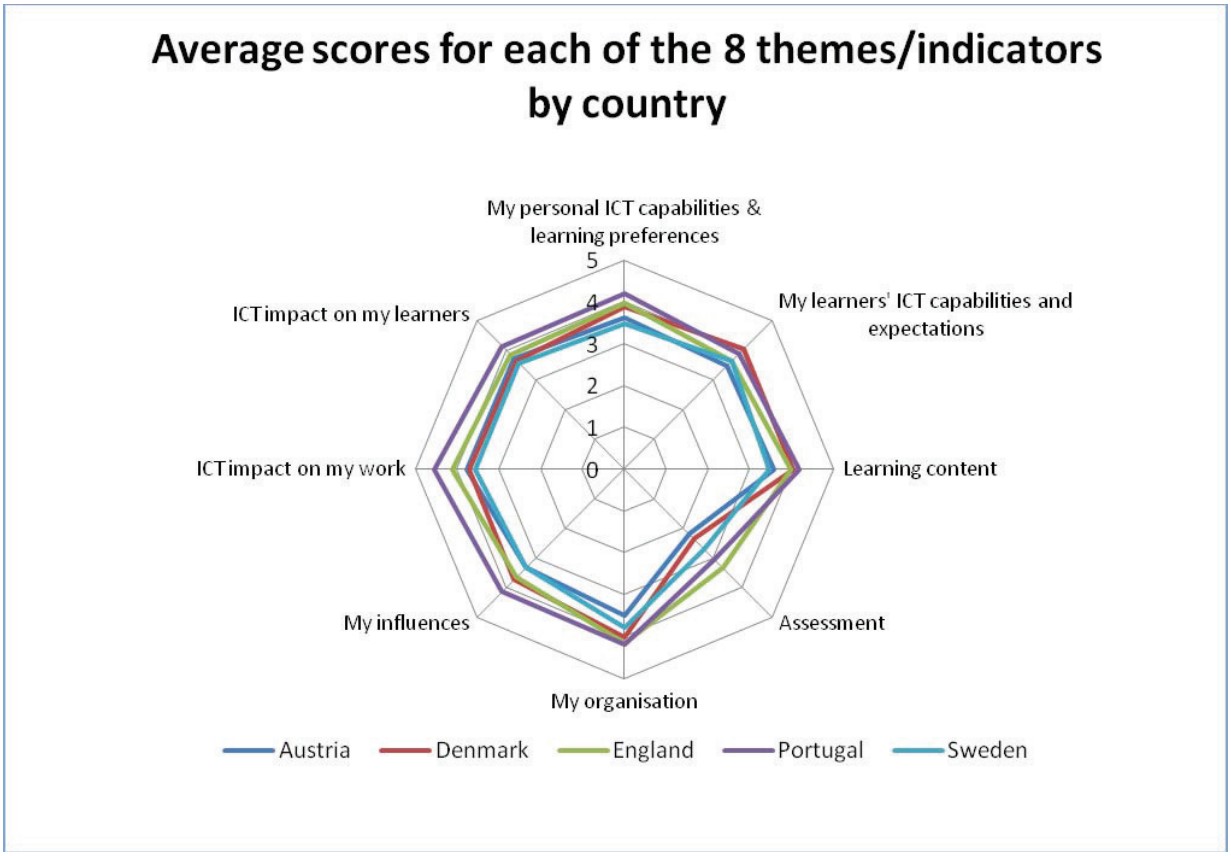
The relationship between the themes is shown in the diagram below:



This approach recognises that ICT cannot be adopted in isolation or simply driven by the skills and enthusiasms of individual practitioners or small groups within institutions. We needed to recognise and take account of the wider environment, and the influence of policy and technological developments.

Findings

The analysis used the 2264 fully completed responses from the five countries. Overall, the individual self-assessments generate high scores (although we cannot be certain that the survey samples represent a complete cross-section of staff).



The diagram shows the average score for each country, indicating how much progress is perceived against each indicator. In all countries the use of technology for assessment is seen as less well developed, while the impact of technology and the organisational environment for technology are both perceived positively.

Headline findings include:

- Both learners and teachers believe that ICT has a beneficial impact on the effectiveness of learning, and on learner satisfaction.
- Learners expect ICT to figure extensively in their learning.
- There is widespread recognition by teachers that ICT has a positive impact on working practices.
- The case for effective deployment of technology in learning, including management and organisation, is supported by the findings of this survey.

The use of ICT in teaching and learning was more developed in academic programmes, particularly the STEM (Science, Technology, Engineering and Mathematics) subjects, than in vocational education and training.

Four areas generated particularly strong responses:

- In all five countries, ICT infrastructure is seen as well developed, with good remote access to IT systems for teachers and a high level of concern for e-safety and security
- Teachers are committed to the use of ICT in their teaching and the development of their personal skills; they make effective use of peers and peer networks for their own learning
- Teachers believe that extensive deployment of ICT increases both the efficiency and effectiveness of their teaching and administration
- Learners are confident in their use of IT and expect it to be used throughout their learning.

Although the overall scores were still high, four areas appear less well developed:

- The use of technology for e-assessment lags behind the general adoption of ICT in learning
- Social media, mobile technologies, and teaching on-line are important aspects of the infrastructure for learning. However, practitioner awareness and understanding is less well developed than for the more established aspects of learning technology.
- There is evidence of a greater use of ICT and Technology Enhanced Learning in STEM subjects than in other subject areas, especially arts and humanities.
- Learners are not always encouraged to use their own IT devices in their learning, or to provide feedback on the use of technology in learning.

There are variations between countries on most measures, with staff in Portugal showing more positive responses on most measures except e-assessment and learner expectation and capability. The findings for Portugal are discussed in the country report. The positive views of staff may be influenced by the significant investment from the EU and the Portuguese Government in promoting technology in education and training.

The country reports demonstrate the effect on staff of different contexts for learning technology. The curriculum context strongly affects staff expectations of technology, and its use for learning and teaching. The Swedish national report may be contrasted with the focus on academic study and/or training for employment focus seen in the UK, Austria and Portugal.

Implications for policy and practice

Key implications for policy and practice emerge from the survey findings and national reports.

These findings are generally applicable across all countries:

- Learners value flexible access to computers and the opportunity to use their own devices. Learning outcomes are likely to benefit if flexible access is embedded into institutional strategies and practice.
- Access to online digital resources is a problem for many teachers. Content developed by teachers is not always shared effectively.
- Informal learning (from family, friends and colleagues) is of growing importance. This has implications for how institutions manage professional development and training: enthusiasm and support can be cascaded via peer networks.
- National partners identified a need to improve the use of Web 2.0 tools, social media and mobile devices, and to encourage teachers and learners to use flexible tools in learning. They emphasised the importance of a positive organisational culture to support this.
- Institutions need to capitalise on developments in e-assessment to develop the self-reflective skills of learners and teachers.
- Large-scale infrastructure investment needs to be generalised across all institutions and further developed over time. There is evidence of uneven or inequitable access to resources between different groups of learners, both inside and outside institutions.

The UK national report has identified the following lessons for English colleges;

- Investment in infrastructure and training has led to widespread readiness to use technology for learning and teaching, but continuing commitment to this investment will be needed to ensure that colleges can maintain their capability and capacity to use technology effectively;
- The use of technology to support assessment is less well developed than other indicators considered in this study. New research on the effective use of technology in assessment (sponsored by the OECD and others) indicates a need for more responsive assessment systems and better development and training. Current requirements for the administration of qualifications remain a barrier to the full development of technology for assessment.
- Staff experience and enthusiasm about using technology can be shared via case studies and peer support networks, building on work being carried out by the Technology Exemplar Network.

In Portugal and England, respondents reported that IT is having a highly positive impact on their work. There were also positive findings in Austria and Denmark. There is a reservoir of goodwill towards the use of technology in learning and teaching. The

majority of staff in the sector are willing to develop their use of technology if appropriate support and infrastructure are in place.

1 Findings

This chapter presents the findings of the research, while methodology and research issues are covered in Chapter 2.

1.1 Headline findings

We cannot be certain that the survey samples are representative of all staff in the sampled countries. Those responding to the survey may be more confident and positive about technology than average, and this is reflected in generally positive balance of results.

Five areas generated particularly strong responses (average scores are given in brackets):

- Across all five countries, institutional ICT infrastructure was felt to be well developed, with good remote access to IT systems for teachers (4.25 average score) and a high level of concern for e-safety and security (4.21)
- Teachers are strongly committed to the use of ICT in their teaching and the development of their personal skills (4.10); they make effective use of peers and peer networks for their own learning (3.94)
- Teachers agree that using ICT increases the efficiency and effectiveness of their teaching and administration (4.15)
- ICT is used most widely in STEM subjects (4.26)
- Learners are confident in their use of IT and expect it to be used throughout their learning (3.98).

Although the overall scores were still strong, four areas appear less well developed in all countries:

- The use of mobile technology, social media, and teaching on-line are at a relatively early stage in all countries (2.96)
- E-assessment is not well developed (2.86)
- The availability, accessibility and deployment of e-learning resources varies greatly between subject areas; it is most extensive in the STEM subjects (4.09), and less developed in Commerce & Business (3.61) and Health & Education (3.72). The use of ICT in teaching and learning was more highly developed in STEM subjects than in other subject areas, or in vocational education and training.
- Learners are not always encouraged to use their own IT devices in their learning, or to provide feedback on the use of technology (3.67).

1.2 Findings from the themes

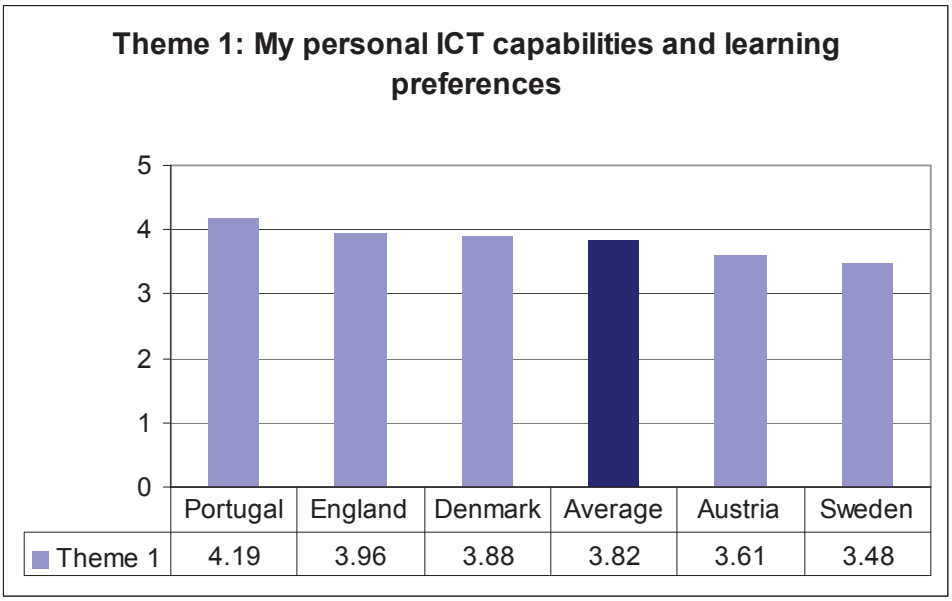
In this section we show the scores for each individual country, together with an average score for comparison. There is little variation between countries for most measures. Any differences are highlighted in the spider diagrams, carpet analysis and the text.

Theme 1: 'Me' – My personal capability (1.1 – 1.9) and learning style (2.1 – 2.4)

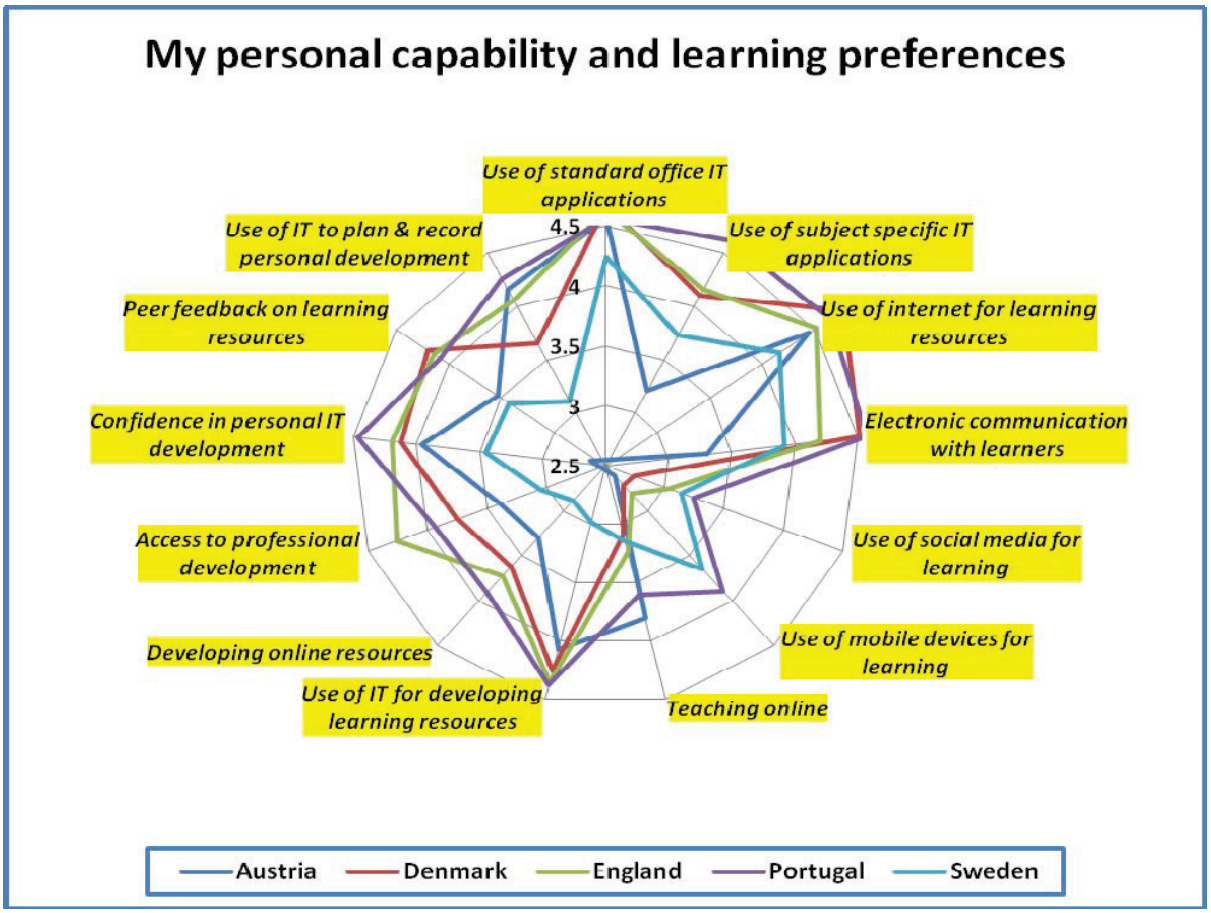
The statements presented under this theme were:

1.1	I make effective use of standard office IT applications in my everyday activities
1.2	I make effective use of subject-specific IT applications in my teaching
1.3	I make effective use of the Internet for research and locating learning resources and lesson plans
1.4	I make effective use of electronic communication to support my learners
1.5	I make effective use of social media to support learning activities
1.6	I make effective use of mobile devices to support learning activities
1.7	I can teach effectively online
1.8	I make effective use of IT to develop learning resources for use in my teaching
1.9	I am effective in developing online resources
2.1	I have access to professional development opportunities to support my use of IT in teaching
2.2	I am confident in developing my own ability in the use of IT in teaching and learning
2.3	I share and seek feedback from my peers on learning resources and lesson plans
2.4	I use IT to plan, record and get feedback on my professional development

The graph shows the average score given in response to these questions. The average across all countries was 3.94, indicating that teachers are generally confident about their own capabilities in the use of ICT in teaching and learning. However there were variations between countries in overall level of teacher confidence, and in responses to individual measures. Respondents in Denmark, England, and Portugal were most likely to agree that they made effective use of IT generally; those in Sweden and Austria were less positive.



Teachers in Sweden gave noticeably less positive responses on most measures. However, the use of social media and mobile devices to support learning was more developed in Sweden than in England, Austria or Denmark.



The table below gives the average scores for teachers in different subject areas and course types. Courses were categorised as either Vocational or Academic, and subjects were grouped into four categories: STEM (Science Engineering, Technology and Maths), Health and Education, Business, and 'Languages, arts and humanities'. It should be noted that specialist IT courses are included in the STEM category, and this may explain the high scores given by teachers in this area.

The cells of the table are coloured to make visual comparison easier. Dark Blue cells indicate scores which are well above average, indicating a high level of embedding of technology. Light blue cells indicate the lowest level of embedding

The rows in the table represent different subjects. Comparing results in different rows shows:

- Teachers of academic courses score higher than teachers of vocational courses, in particular in the effectiveness of their use of electronic communication to support learners.
- Teachers of STEM subjects show the most developed use of IT.
- The Health & Education and Commerce & Business subject groups typically show the lowest scores.

The columns of the table give the scores for different measures. Comparing results in different columns shows:

- Teachers of all subjects have well developed capability to use standard IT office applications and to use IT for researching resources
- There is much less confidence in ability to use social media, mobile devices and online teaching. (These results are confirmed by the findings of the 2009-10 Becta survey across a wider sample of FE colleges[1]).
- Teachers of Health & Education, Commerce & Business, and Languages, Culture, Arts & Media show the lowest development of online learning resources.

[1] http://research.becta.org.uk/index.php?section=rh&catcode=_re_os_sc_03&rid=17752

Key to subject groups, course type and colour coding:

Subject group	STEM: Science, Technology, Engineering & Maths	H&E: Health & Education	C&B: Commerce & Business	LCAM: Languages, Culture, Arts & Media
Course type	A: Academic		V: Vocational Education & Training	
Level (self assessed)	Lowest level of embedding	Some embedding developing	Substantial embedding	Largely or wholly embedded

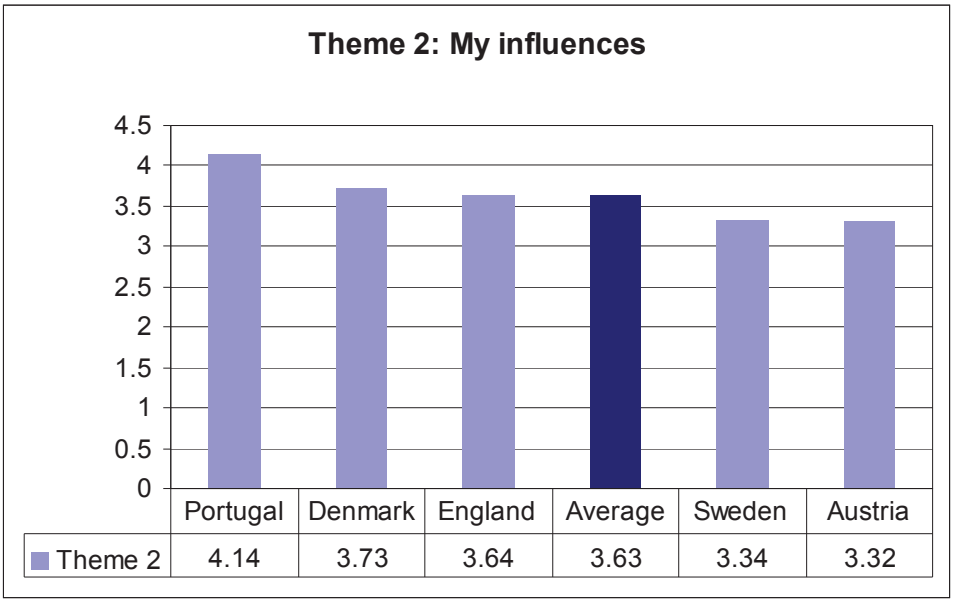
Subject group	Course type	Sample size	Effective use of standard office IT applications	Effective use of subject-specific IT applications	Effective internet use for researching resources	Effective use of IT to support learners	Effective use of social media to support learning	Effective use of mobile devices to support learning	Teaching effectively online	Effective use of IT to develop learning resources	Effective development of online resources	Access to professional development for IT	Confidence in developing my own IT skills for teaching	Seeking feedback from peers on learning resources	Using IT to record professional development & receive feedback	Teacher capabilities and learning styles
STEM	A	316	4.65	4.59	4.61	4.53	3.04	3.49	3.52	4.37	4.02	3.97	4.49	4.11	4.17	4.14
STEM	V	462	4.63	4.45	4.57	4.24	2.99	3.34	3.74	4.48	3.92	4.01	4.50	4.04	4.31	4.11
H&E	A	85	4.65	4.00	4.67	4.36	3.16	3.21	3.71	4.27	3.80	4.02	4.24	4.19	4.14	4.04
H&E	V	178	4.64	3.74	4.61	3.95	2.68	3.02	3.34	4.14	3.41	3.76	3.94	3.91	3.96	3.79
C&B	A	153	4.57	4.29	4.58	4.41	3.21	3.53	3.46	4.22	3.69	3.71	4.25	4.02	4.11	4.01
C&B	V	311	4.46	3.60	4.53	3.74	2.69	3.02	3.48	4.06	3.43	3.73	4.02	3.78	4.03	3.75
LCAM	A	149	4.56	4.10	4.58	4.38	3.20	3.28	3.40	4.03	3.50	3.64	4.07	3.74	3.75	3.88
LCAM	V	213	4.63	3.67	4.46	4.05	2.94	3.14	3.40	3.90	3.27	3.46	3.88	3.77	3.92	3.73
All	A	817	4.54	4.36	4.60	4.45	3.12	3.43	3.51	4.26	3.80	3.88	4.33	4.03	4.09	4.05
All	V	1447	4.61	3.97	4.53	4.01	2.87	3.18	3.49	4.18	3.56	3.78	4.13	3.89	4.06	3.88
All	All	2264	4.56	4.11	4.55	4.17	2.96	3.27	3.49	4.21	3.65	3.82	4.21	3.94	4.07	3.94

Theme 2: 'My influences' – External (9.1 – 9.3), and peer-based (10.1 – 10.2)

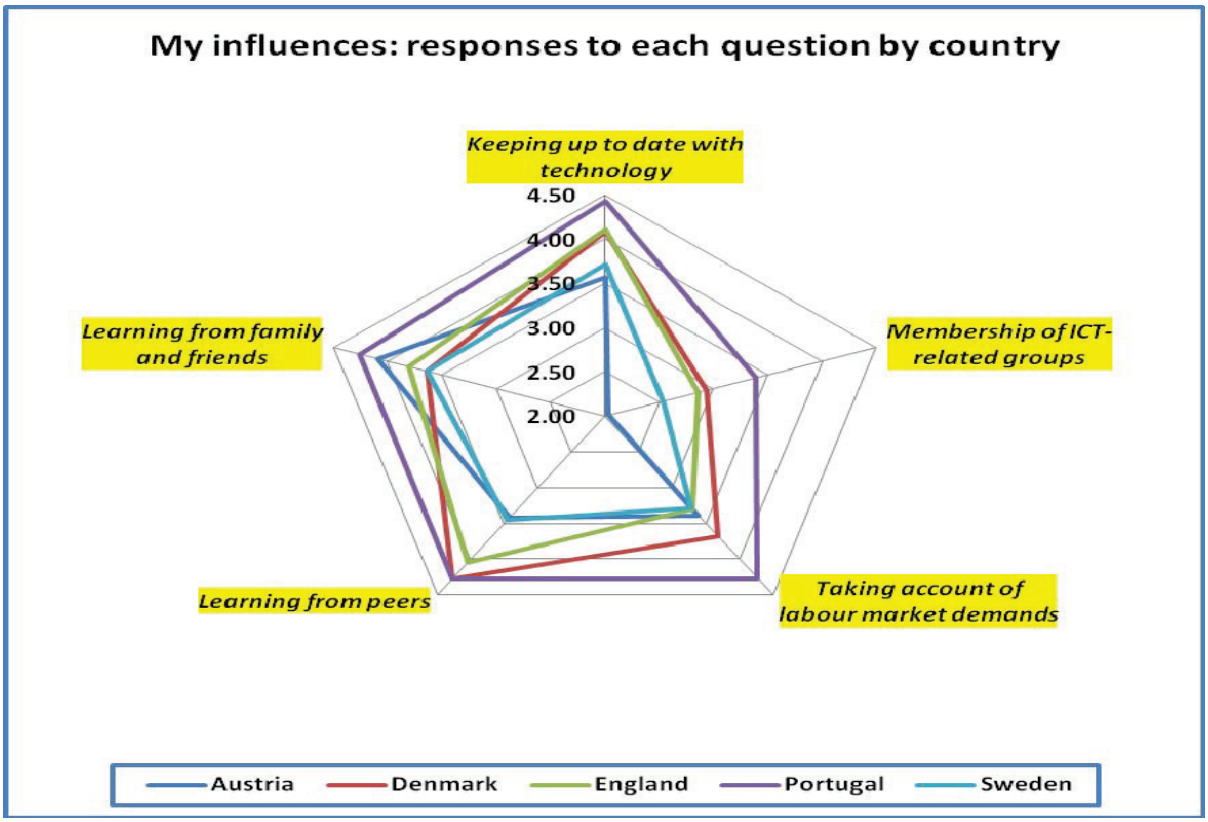
The statements presented under this theme were:

9.1	**I keep up to date with new technology developments which might affect my work**
9.2	**I am an active member of one or more IT-related interest groups or professional bodies**
9.3	**I take account of the demands of the labour market in how I use IT in my courses**
10.1	**I discuss technology developments and experiences with my peers and learn from them**
10.2	**I improve my IT skills through interactions with family and friends**

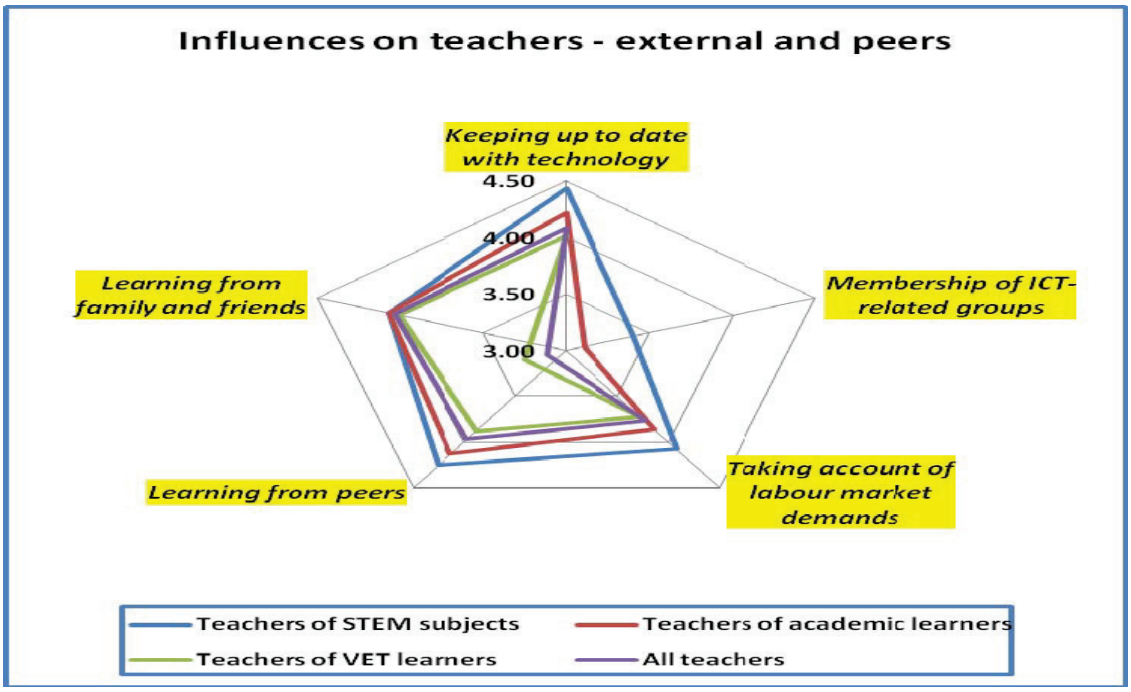
The graph shows the average score given across these statements. There is a large variation in the answers given by teachers in different countries. As in the previous section, teachers in Portugal gave the most positive responses, while Sweden and Austria were below average (3.63).



The spider diagram below distinguishes results for individual measures. Teachers in Portugal were more likely to be an active member of an IT-related interest group; those in Austria were unlikely to be. Danish and English respondents said they developed their skills through interaction with their peers; those in Austria and Sweden were more likely to learn from family and friends.



The next diagram shows variation between teachers of different subjects, rather than between countries. Family and friends are important influences on teachers of all subjects. Teachers of STEM subjects and Academic subjects score more highly than other teachers.



Teachers in vocational education and training are less likely to learn from their peers. Somewhat surprisingly, vocational teachers are less likely to take account of labour market demands in their subject area.

Keeping up to date with new technology developments is seen as very important by all teachers and discussion with peers is a particularly important way to do this. This is shown especially strongly by teachers aged over 30 delivering academic courses.

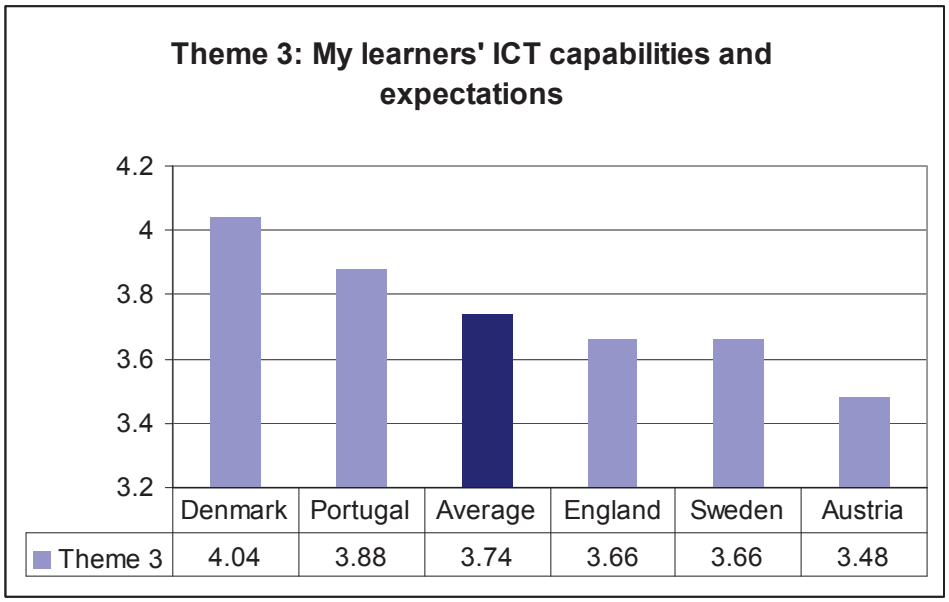
Active membership of ICT-related professional bodies or interest groups is relatively rare, especially amongst teachers aged over 30. Membership levels are particularly low amongst older teachers of vocational education and training.

Theme 3: 'My learners' – Their capability (3.1 – 3.5) and expectations (4.1 – 4.3)

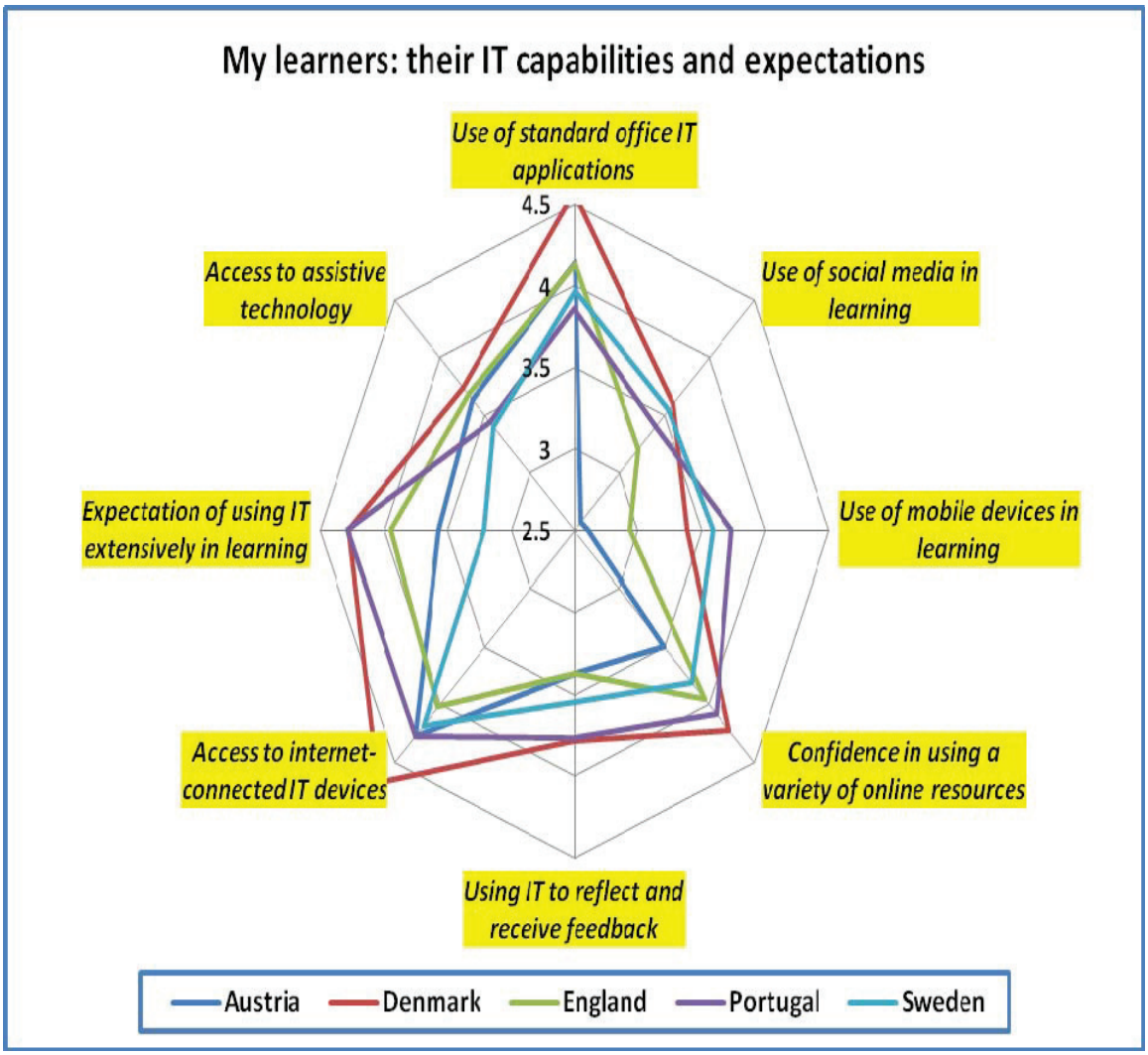
The statements presented under this theme were:

3.1	My learners make effective use of standard office IT applications
3.2	My learners make effective use of social media in their learning
3.3	My learners make effective use of mobile devices in their learning
3.4	My learners are confident in using a variety of online learning resources
3.5	My learners use technology to reflect and to receive feedback on their learning
4.1	My learners have good access to IT devices that are connected to the Internet
4.2	My learners expect to use IT applications extensively in their learning
4.3	Learners who need support in their use of IT have good access to assistive technology

The next graph compares the average score across these measures. The overall mean score of 3.74 is quite positive. Respondents in Denmark evaluated the expectations and capability of learners most highly, and teachers in Portugal also gave above-average responses.



The next chart shows the scores given on individual measures. English and Austrian respondents report less use by learners of social media and mobile devices. Respondents in Sweden were less likely to feel that their learners had high expectations of using IT. Danish respondents report higher expectation from their learners, and agree more strongly than do other respondents that learners have good access to Internet connected devices, and use standard IT applications.



The next table shows results for individual measures broken down by course type. As well as being asked what course they taught, teachers were also asked what age group they taught, and those who teach courses to older adults (aged 30+) are picked out for particular study.

Key to subject groups, course type and colour coding:

Subject group	STEM: Science, Technology, Engineering & Maths	H&E: Health & Education	C&B: Commerce & Business	LCAM: Languages, Culture, Arts & Media
Course type	A: Academic		V: Vocational Education & Training	
Level self-assessed	Lowest level of embedding	Some embedding developing	Substantial embedding	Largely or wholly embedded

Subject group	Learner age group	Sample size	Learners make effective use of standard IT applications	Learners use social media effectively in their learning	Learners make effective use of mobile devices in their learning	Learners are confident in using online resources	Learners use technology to reflect and receive feedback on their learning	Learners have good access to internet-connected IT devices	Learners expect to use IT applications extensively in their learning	Learners needing support have good access to assistive technology	***Overall***: Learner capabilities and expectations
STEM	**30 plus**	**70**	4.33	2.94	2.98	3.74	3.89	4.43	4.29	3.84	3.82
STEM	**All**	**778**	4.05	3.17	3.35	4.06	3.70	4.39	4.24	3.64	3.84
H&E	**30 plus**	**65**	4.05	3.21	3.07	3.52	3.35	4.27	3.69	3.69	3.61
H&E	**All**	**263**	4.17	3.22	3.08	3.72	3.44	4.29	3.93	3.56	3.68
C&B	**30 plus**	**57**	4.14	2.81	2.69	3.51	3.32	4.21	3.39	3.47	3.45
C&B	**All**	**464**	4.01	3.14	3.15	3.84	3.50	4.10	3.84	3.56	3.65
LCAM	**30 plus**	**39**	3.97	3.17	3.17	3.83	3.37	4.19	3.51	3.52	3.61
LCAM	**All**	**362**	4.05	3.36	3.41	3.91	3.59	4.17	3.70	3.44	3.71
Other	**30 plus**	**41**	3.84	2.71	2.97	3.51	3.46	3.98	3.74	3.42	3.47
Other	**All**	**397**	3.99	3.22	3.32	3.87	3.52	4.17	3.92	3.53	3.70
All	**30 plus**	**272**	4.10	2.97	2.96	3.62	3.51	4.24	3.77	3.62	3.61
All	**All**	**2264**	4.05	3.21	3.28	3.92	3.58	4.25	3.98	3.56	3.74

The rows of the table distinguish results for different groups of learners:

- Learners aged over 30 in Commerce & Business and 'Other' subjects have lower capabilities and expectations than most other groups
- Learners in Languages, Culture, Arts & Media also tend to have lower expectations and capability

The columns of the table distinguish results for particular measures:

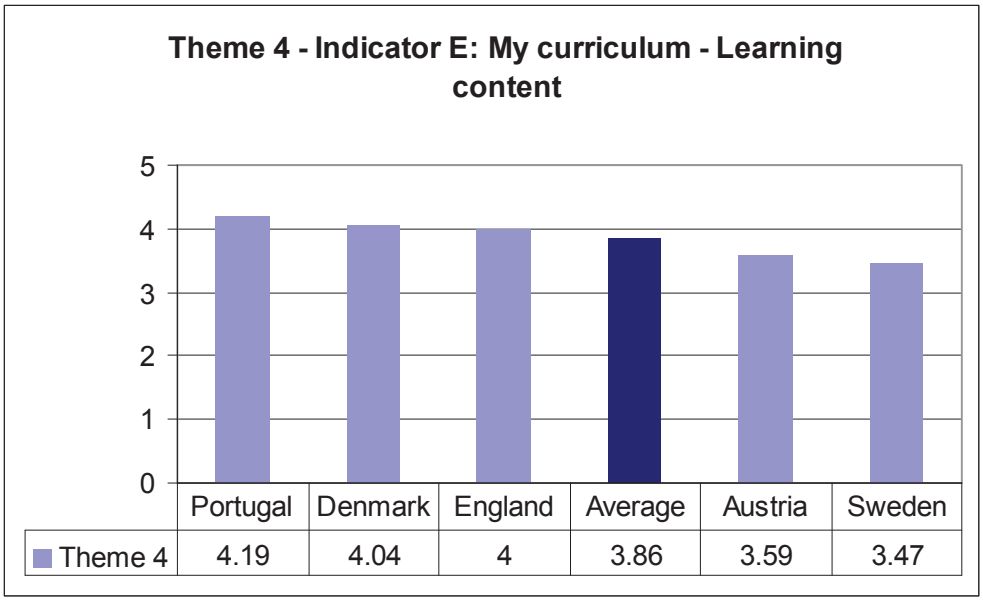
- Learners make only moderate use of social media and mobile devices in their learning, with learners aged over 30 in Commerce & Business and studying 'Other' courses scoring particularly low.
- There is moderate learner use of technology for reflection and feedback. Older learners are the least likely to use technology in this way.
- Almost all learners have good access to internet-connected devices at their institution: the overall Learner access score of 4.25 is identical to staff access.
- Teachers of all subjects report that learners are able to make effective use of standard IT applications and, in most cases, expect to make extensive use of IT in their learning.

Theme 4: 'My curriculum' – Learning content (5.1 – 5.2)

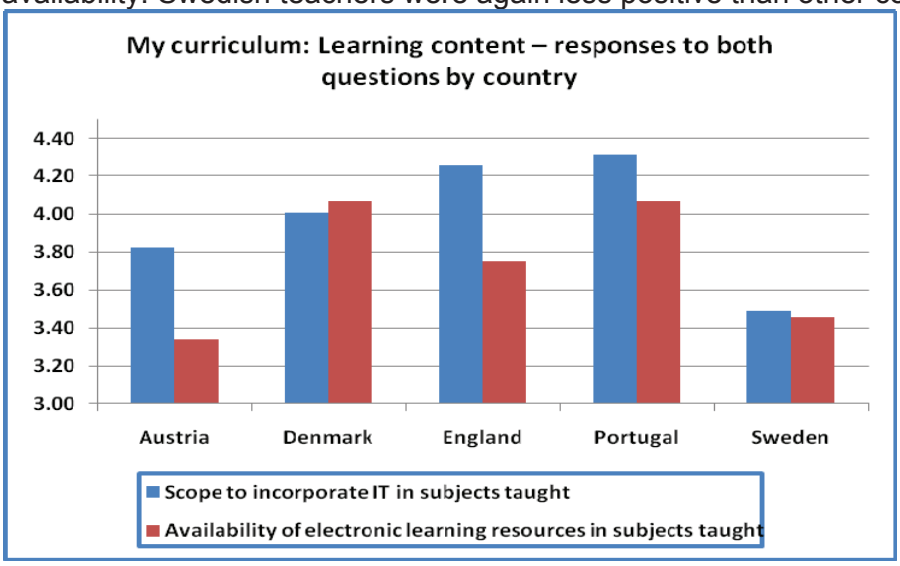
The statements presented under this theme were:

5.1	There is good scope to incorporate use of IT in the subjects I mainly teach
5.2	Electronic learning resources are widely available in the subjects I mainly teach

The next graph shows average scores in different countries. In general the level of agreement was high. Denmark, England and Portugal averaged a score of 4 or more (where 4 = 'Agree' and 5='Agree strongly').

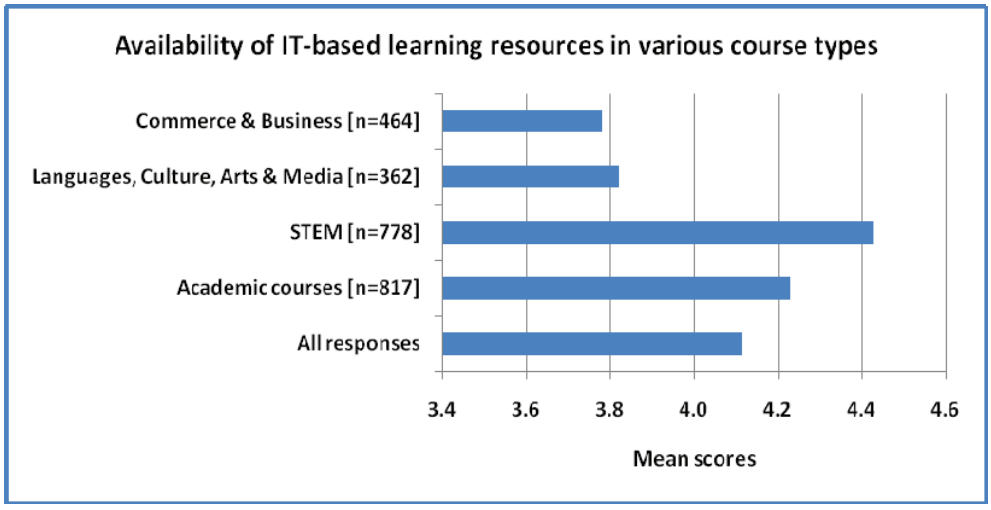


The next graph shows the results for each of the two measures. In general, respondents were strongly positive about the scope to incorporate IT in their teaching and the availability of electronic learning resources. Portuguese respondents were positive on both measures. English respondents reported scope to incorporate IT but lower resource availability. Swedish teachers were again less positive than other countries.



There was good scope to incorporate IT in STEM courses (average score 4.43) and in academic courses in general (4.23). The subject groupings giving least scope were Commerce & Business (3.78) and Languages, Culture, Arts & Media (3.78). Courses for learners aged over 30 also scored well below the mean (3.86).

The next graph shows the availability of resources by course type. Teachers in Health & Education and Commerce & Business teachers reported fewer electronic resources than others.



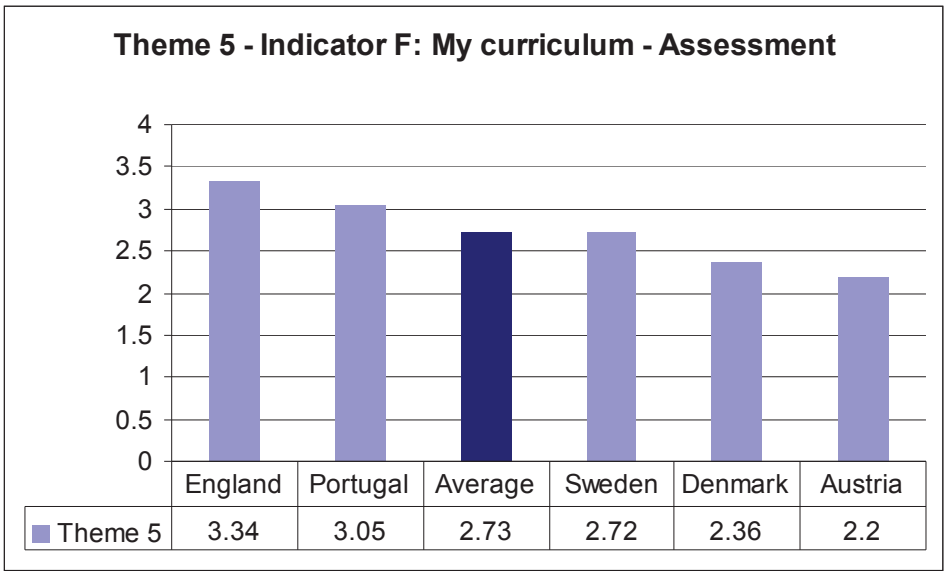
Combining both measures, academic courses provided better curriculum opportunity than vocational courses.

Theme 5: 'My curriculum' – Assessment (6.1 – 6.4)

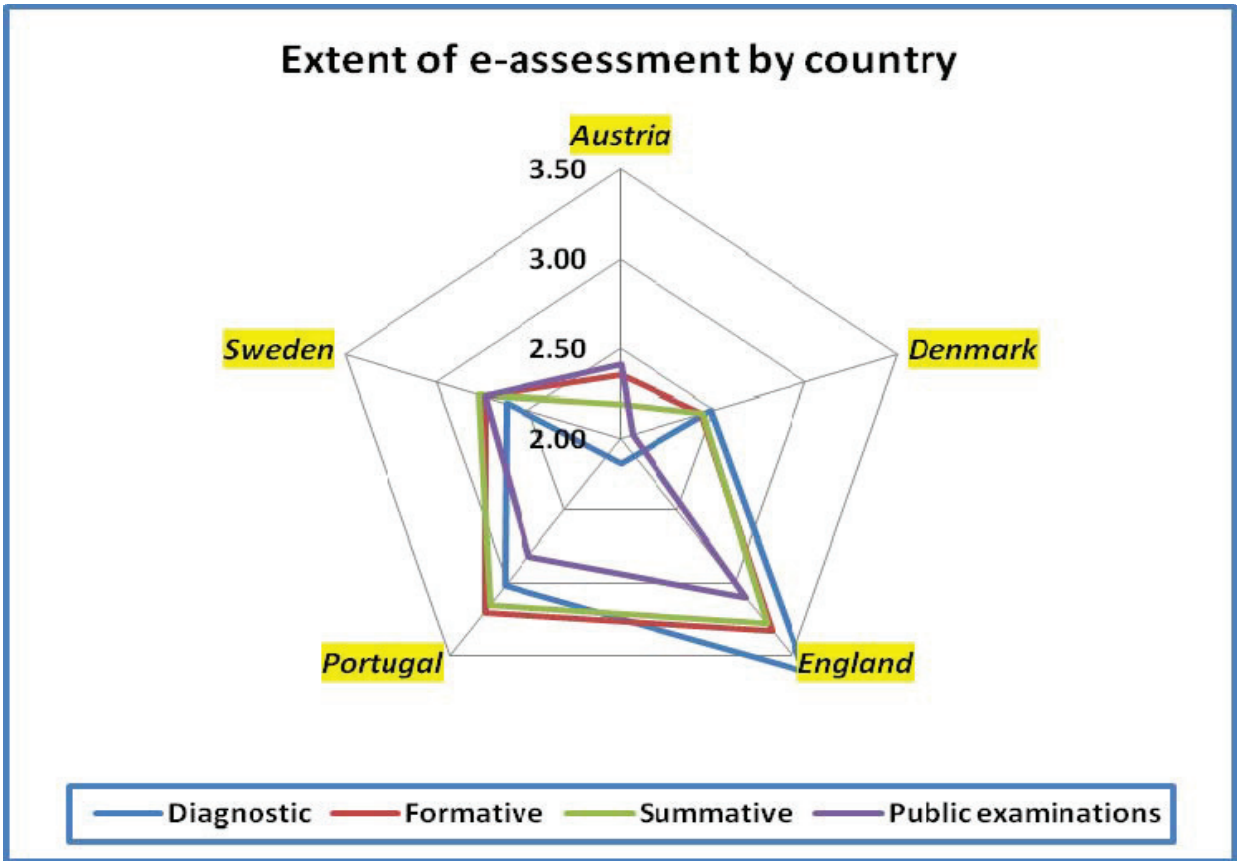
The statements presented under this theme were:

6.1	There is significant use of e-assessment for diagnostic purposes at the start of courses
6.2	There is significant use of e-assessment for formative purposes
6.3	There is significant use of e-assessment for summative purposes
6.4	There is significant use of e-assessment in public examinations

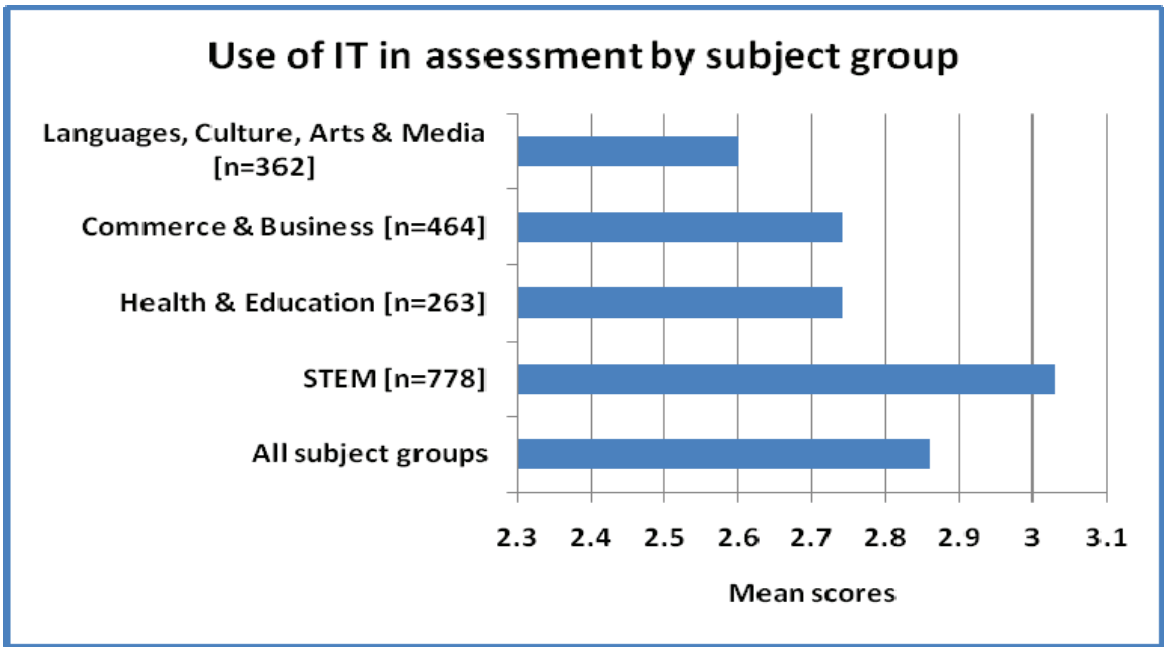
In contrast to the last section, the use of technology for assessment was limited. This was the lowest scoring of all the indicators, scoring only 2.73 overall.



The next chart shows results for the different countries. Teachers in England and Portugal are more likely than teachers in other countries to express positive opinions, but levels are generally low.



The next graph shows results by subject taught. Only teachers delivering STEM subjects recorded an overall score above 3. Other subject groupings achieved 2.75 or less on this indicator. There is less use of e-assessment with learners aged over 30 than with younger age groups.



E-assessment is currently most commonly used for formative purposes (2.96) and least commonly used for public examinations (2.72). However, the use of e-assessment in public examinations was slightly more common in vocational education and training programmes (2.76) than on academic courses (2.65); this is virtually the only area where VET courses record a higher score than academic ones.

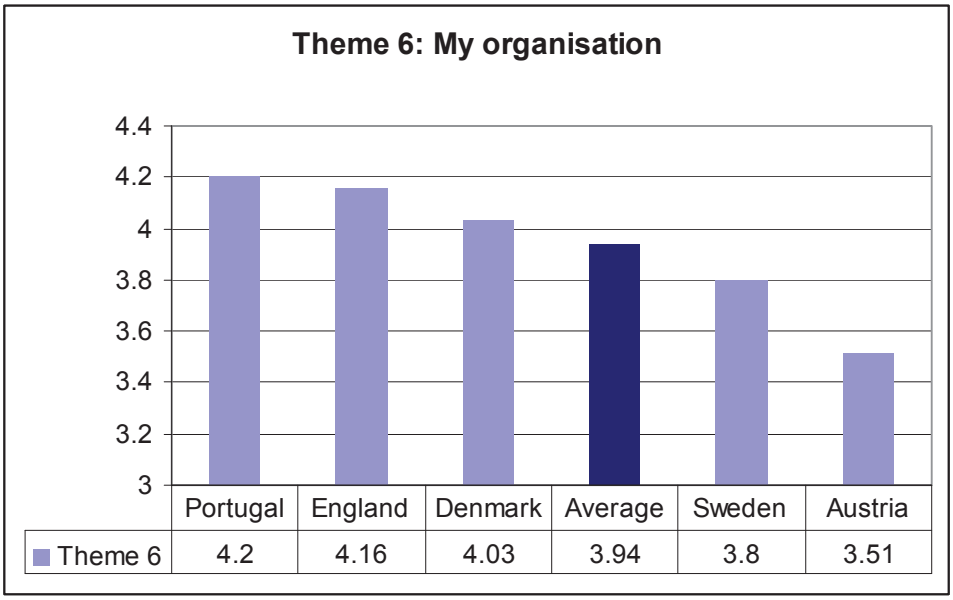
Theme 6: 'My organisation' - Infrastructure (7.1 – 7.5) and culture (8.1 – 8.6)

The statements presented under this theme were:

7.1	I have access to an Internet-connected computer at work, where and when I need it
7.2	I have good access to my organisation information system from my home
7.3	My organisation provides a learning management system
7.4	My organisation provides good IT technical support
7.5	E-safety and Internet security are very important in my organisation
8.1	Electronic communication is part of everyday interaction between staff and students
8.2	My organisation requires me to make active use of IT in teaching and learning
8.3	My organisation encourages innovation in technology use
8.4	My organisation encourages feedback on the performance of its IT systems and services
8.5	I am encouraged to seek out and share good practice in technology use
8.6	My organisation encourages students to use their own IT devices in learning

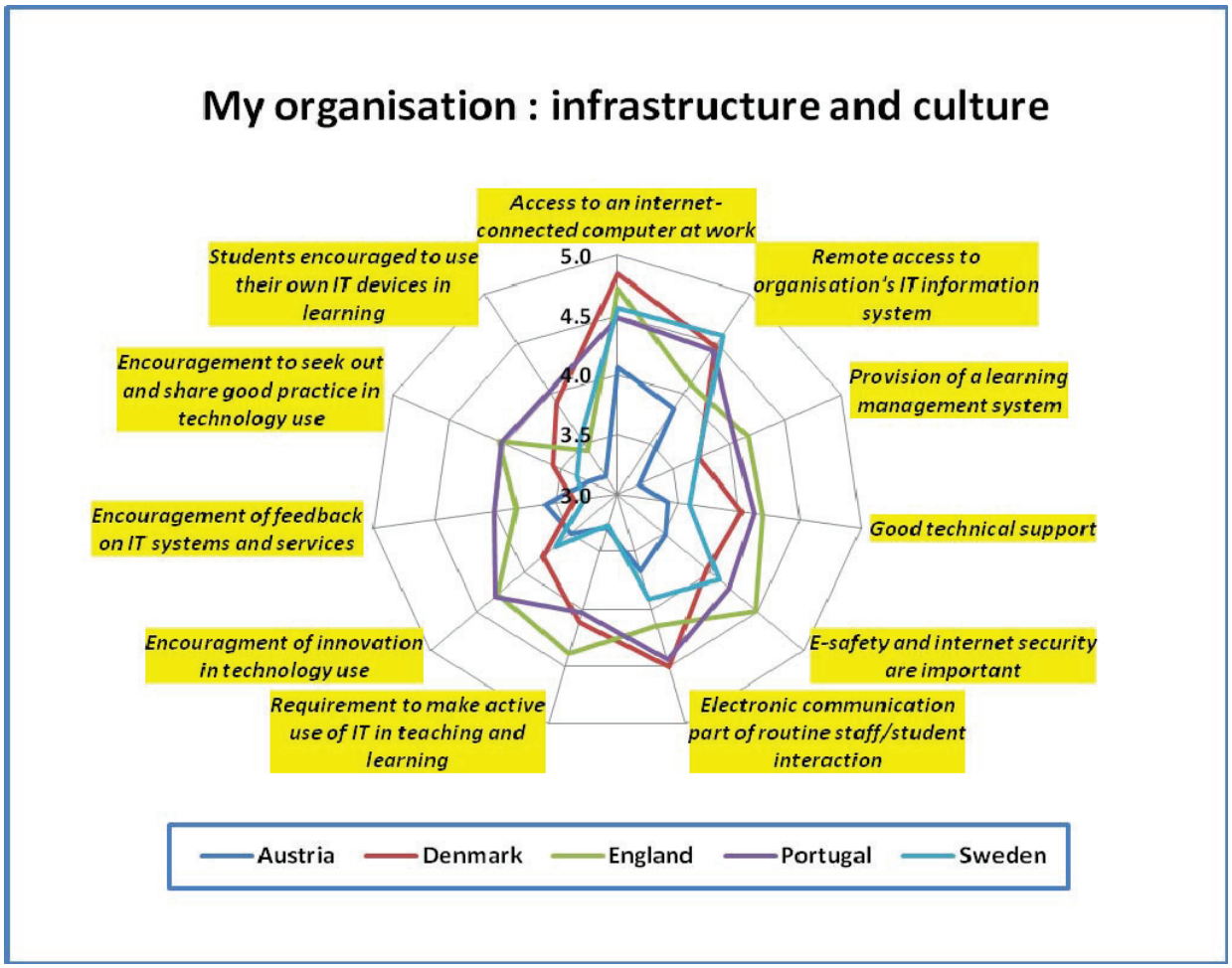
IT infrastructure is well developed in all countries, with an overall aggregated score for the eleven questions of 4.0. Portugal (4.2) and England (4.16) had particularly strong infrastructure, and organisations supportive of the use of IT. Austrian teachers gave the least favourable responses.

The next chart shows the levels reported for each measure.



Almost all respondents reported access to an Internet-connected computer at work when they needed (mean score of 4.48 for all respondents), with the lowest national score

coming from Austria at 4.07. All countries reported a high level of electronic communication with both other staff and with students (4.18).



Almost all respondents reported access to an Internet-connected computer at work when they needed (mean score of 4.48 for all respondents), with the lowest national score coming from Austria at 4.07. All countries reported a high level of electronic communication with both other staff and with students (4.18).

Three other areas generated particularly scores:

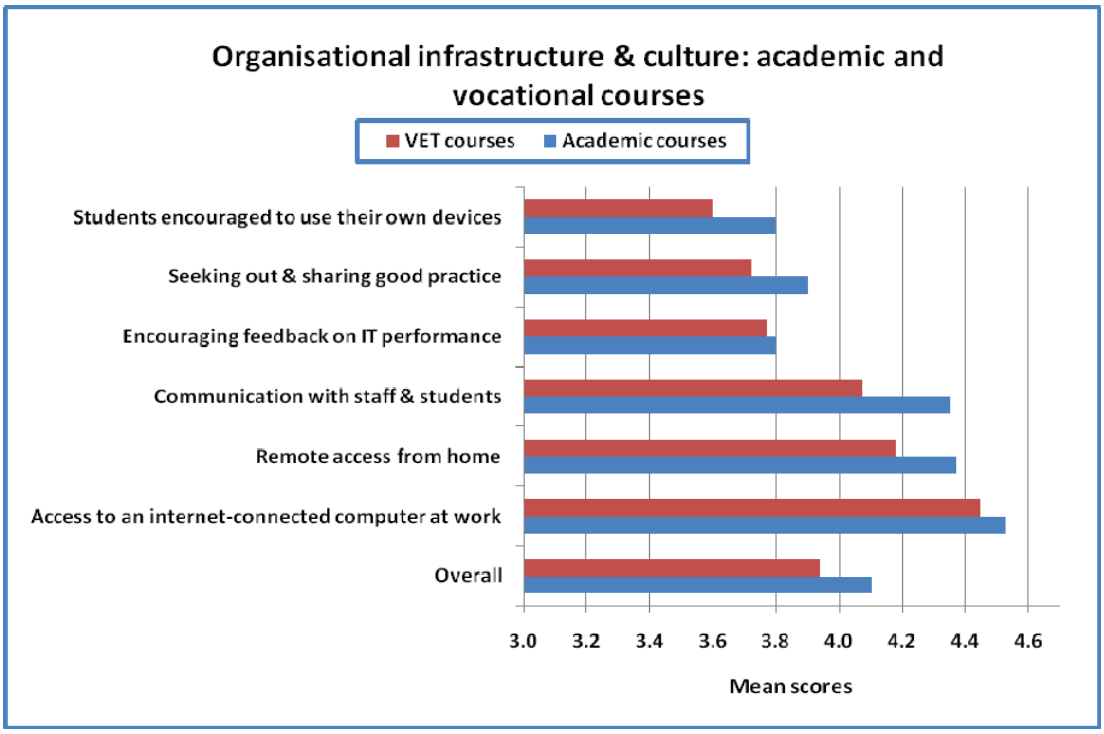
- Good remote access for staff to college IT (4.25)
- Strong focus in employing organisations on e-safety and security (4.10)
- Positive encouragement for innovation (4.04)

Four less strong areas were:

- The extent to which students are allowed to use their own devices (3.67)
- The extent to which feedback on IT services and performance is encouraged (3.78)

- The extent to which teachers are encouraged to seek out and share good practice (3.79)
- Access to a learning management system (3.85)

The next graph contrasts the results from teachers on academic and vocational courses. Although the differences on individual questions are not great, staff teaching on academic courses recorded higher scores on every measure.



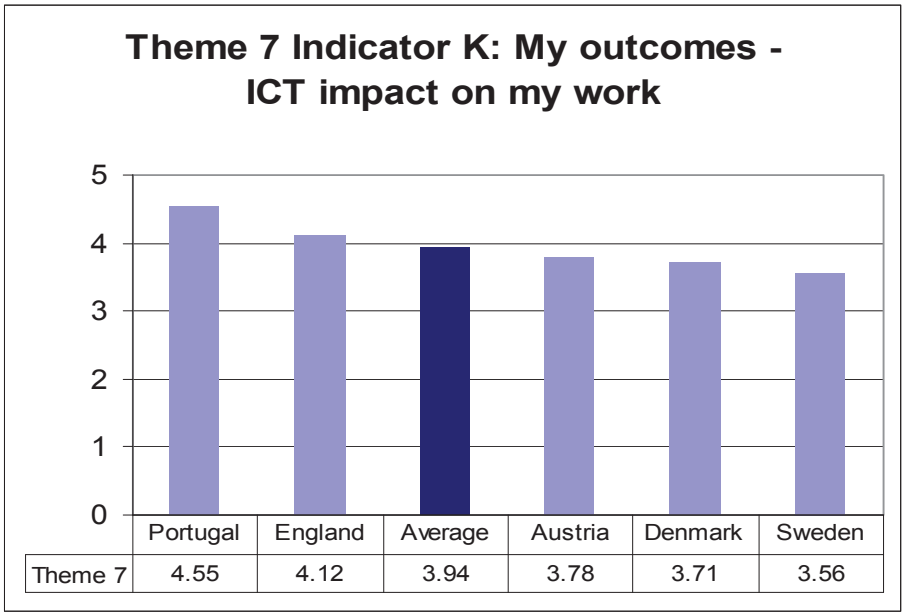
The lowest scores were recorded by staff delivering VET to students aged over 30, especially in Commerce & Business and Languages, Culture, Arts & Media.

Theme 7 - Impact of IT on teacher's work overall (11.1 – 11.4)

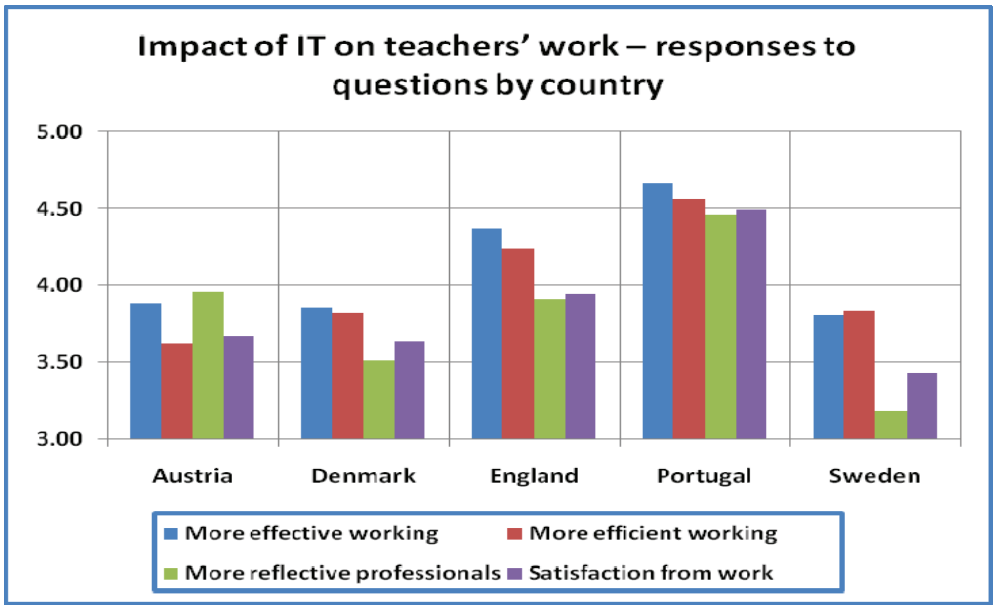
The statements presented under this theme were:

11.1	IT makes my work more effective, enabling me to do what I need to do
11.2	IT makes my work more efficient, enabling me to do things more quickly or with less effort
11.3	IT helps me to be a better, more reflective professional
11.4	IT makes my work more satisfying, pleasant and rewarding

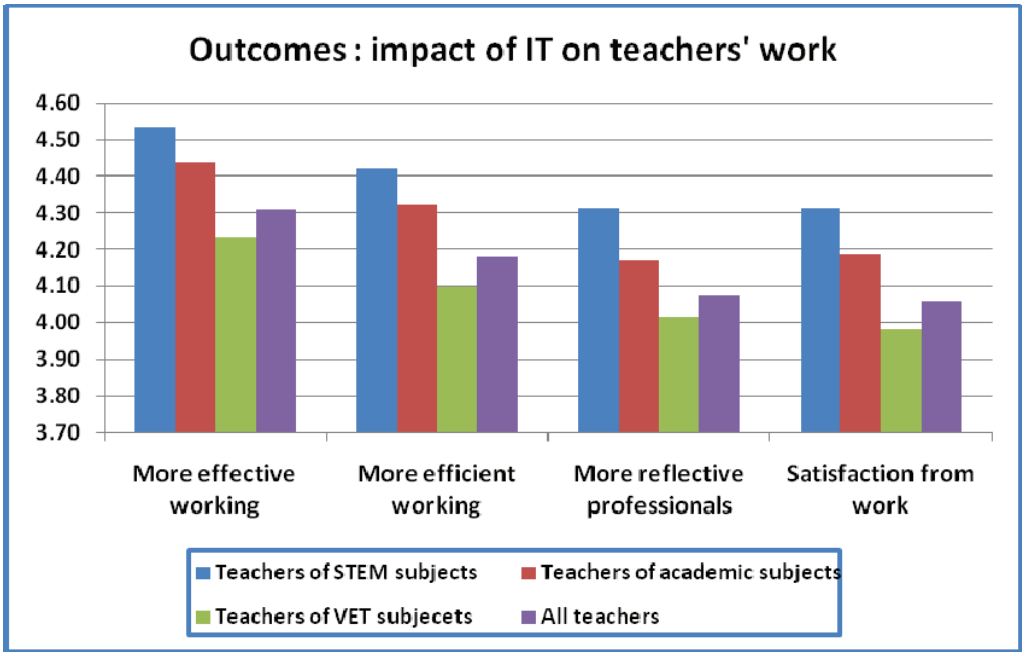
This is a high scoring indicator overall, with almost all scores at 3.6 or above. Particularly in Portugal and England, respondents reported that IT has a positive impact on their work.



The next graph shows the responses to questions in each country. The majority of respondents in all countries agreed that technology made their work more effective and efficient. Teachers in Sweden are less likely to feel that IT makes them reflective and makes their work more satisfying than those in the other four countries



The next graph distinguishes the responses given by teachers of different subjects. IT appears to have a particularly positive effect on the work of teachers of STEM subjects.



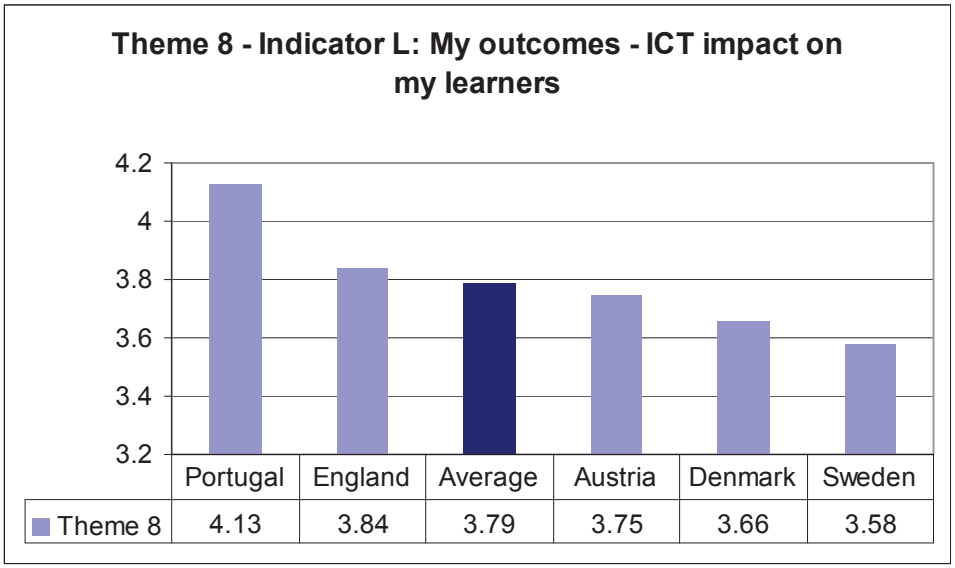
There are no clear differences in the degree of impact that IT has in the teaching of different age groups of learners. However teachers of academic courses were more likely to identify a positive impact from the use of IT than those teaching vocational subjects.

Theme 8 - Impact of IT on learners (12.1 – 12.4)

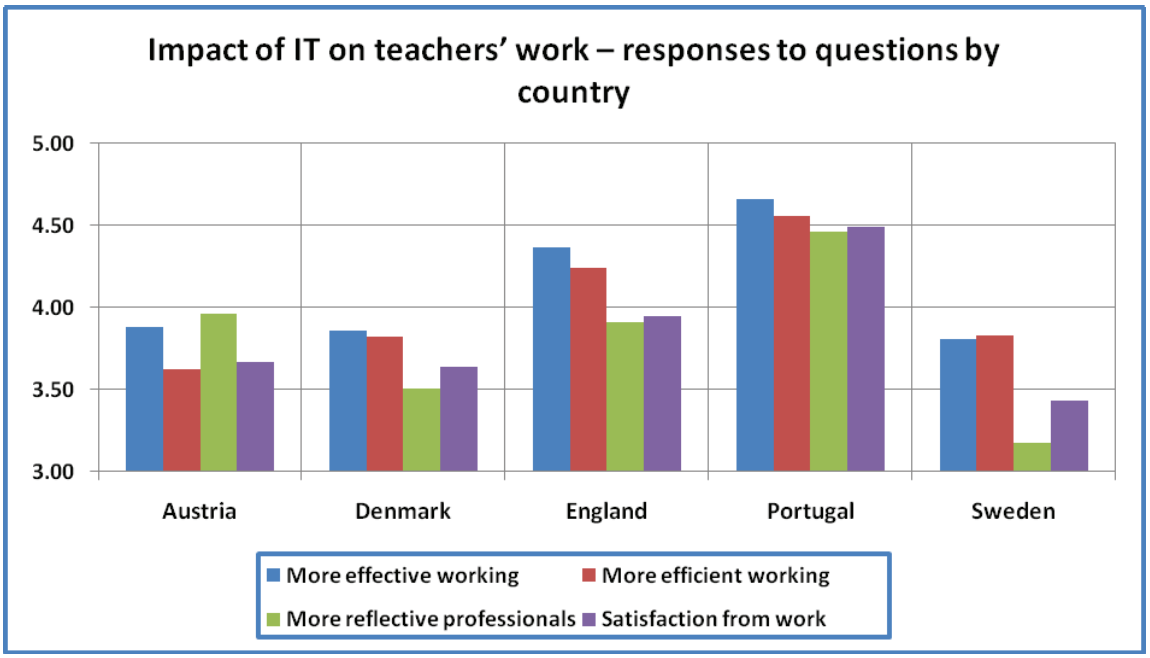
The statements presented under this theme were:

12.1	My learners use of IT makes their study more effective
12.2	My learners use of IT makes their study more efficient
12.3	My learners' use of IT contributes to making them better, more reflective learners
12.4	My learners' use of IT makes their study more satisfying, pleasant and rewarding

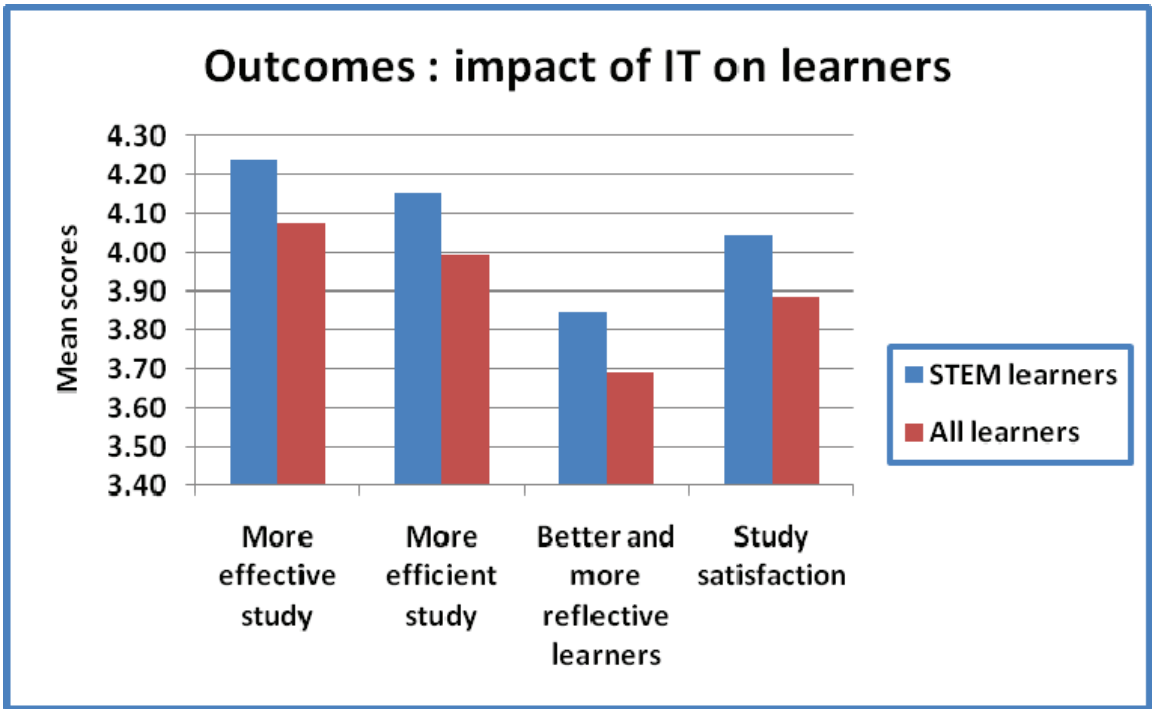
The next graph shows average scores for the five countries. Teachers in all countries tended to say that IT has a positive impact on learners' studies. Teachers in Portugal expressed the most positive opinions, as with previous measures.

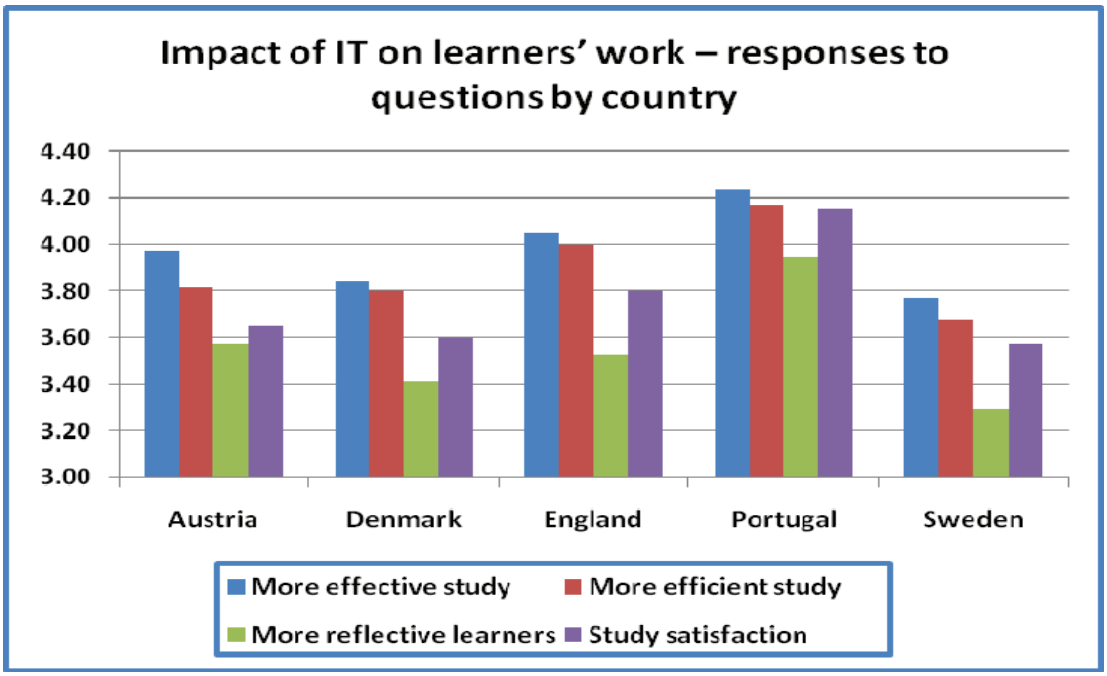


The next graph distinguishes the responses to individual measures between the countries. Swedish teachers were the least likely to agree that the use of IT leads to more reflective learners.



The next graph distinguishes opinions on the impact of IT on learners between teachers of STEM subjects, and other teachers. In all measures, STEM teachers were more likely to express a positive view, though results are favourable for all subjects.





The most positive opinions about the impact of IT on learners were reported by teachers who taught academic subjects to older learners (however, the sample size in this category is only 57 teachers).

2 The survey

2.1 Introduction

Becta leads the UK's ambition to inspire and guide the effective and innovative use of technology throughout learning. It has published an implementation plan for delivering the national strategy in the further education and skills sector[2].

Learners and employers increasingly expect technology to play a major role in learning. Some learning providers are already using technology innovatively and effectively, and increasing numbers are developing their expertise.

If learners are to get the best from technology, it is essential for the education workforce to have up-to-date skills and knowledge. Becta is working with national partners to support learning providers in developing an "e-confident" workforce. Becta intends to learn from international experience to refine the UK strategy. This International Benchmarking Project has been undertaken to compare experiences across national systems, and to set a baseline of current levels of e-confidence and technology use.

The results of this research suggest that used properly, technology improves teaching and learning and business processes; learners are more motivated, make faster progress and get better results; learning providers are more efficient and offer better services[3].

2.2 Countries

Focused on teaching staff in general further education institutions, the benchmarking survey aimed to collect data from the English FE and Skills Sector and up to four other European tertiary systems, in a mutually beneficial comparative exercise. The five countries which participated in the survey were: Austria, Denmark, England, Portugal and Sweden. Details of the institutions involved are given in Appendix 3 and the guidelines for conducting the survey are in Appendix 4.

The aim was to collect data from comparable post-16 education environments, as far as was practicable. Tertiary education is structured differently in each country and Appendix 2 displays this in diagrammatic form. The figure below (extracted from Appendix 2) shows the strands of post-compulsory education in the five countries that took part in the benchmarking project:

[2] Next Generation Learning - Revised implementation plan for delivering the Harnessing Technology strategy in the Further Education and Skills sector, 2009-2012

[3] Becta 2010, "Harnessing Technology Review 2009: the role of technology in further education and skills", Becta, Coventry

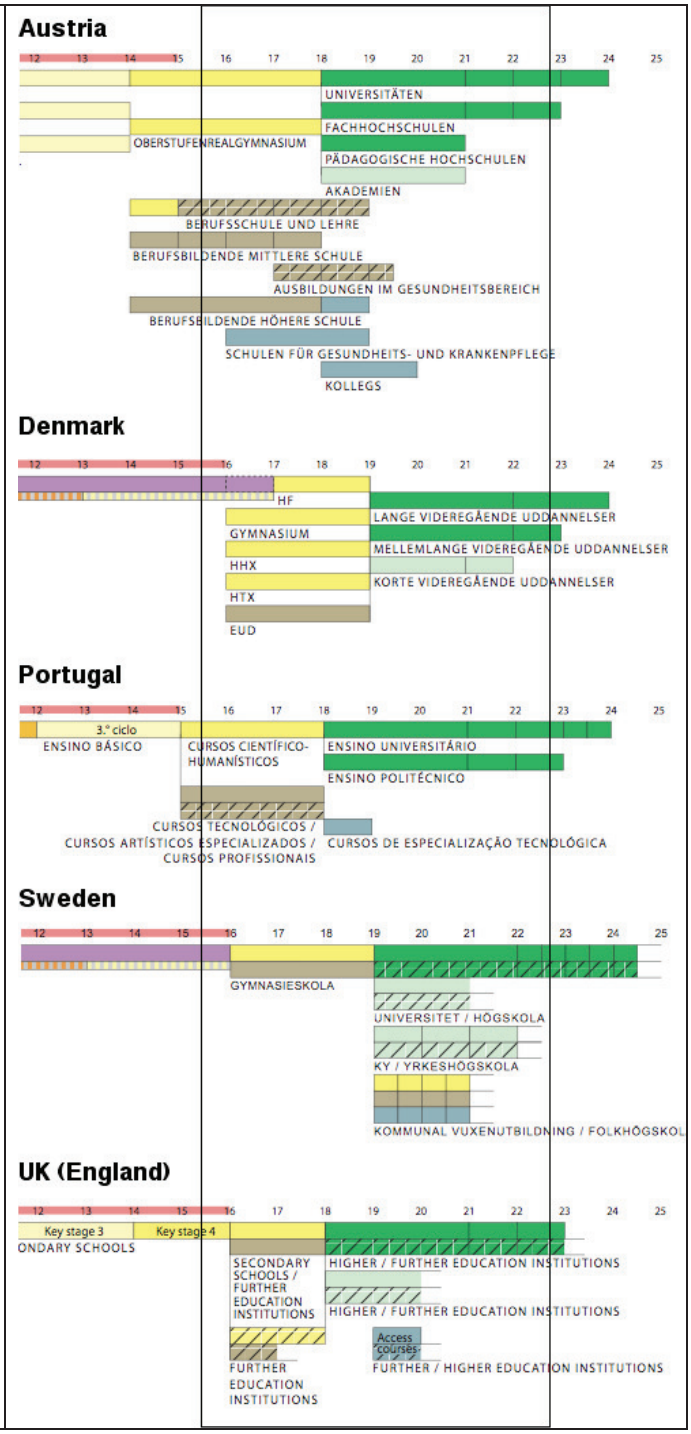
The strands of education in each country are classified by their ISCED level (International Standard Classification of Education, http://www.uis.unesco.org/TEMPLATE/pdf/isced/ISCED_A.pdf.

These levels are colour-coded as follows:

- Single structure (no institutional distinction between ISCED 1 and 2)
- Lower secondary general - ISCED 2 (including pre-vocational)
- Lower secondary vocational - ISCED 2
- Upper secondary general - ISCED 3
- Upper secondary vocational - ISCED 3
- Post-secondary non-tertiary - ISCED 4
- Tertiary education - ISCED 5B
- Tertiary education - ISCED 5A
- Part-time or combined school and workplace courses

5A is “largely academic orientation”, while 5B is “more practical, technical or even vocational orientation”.

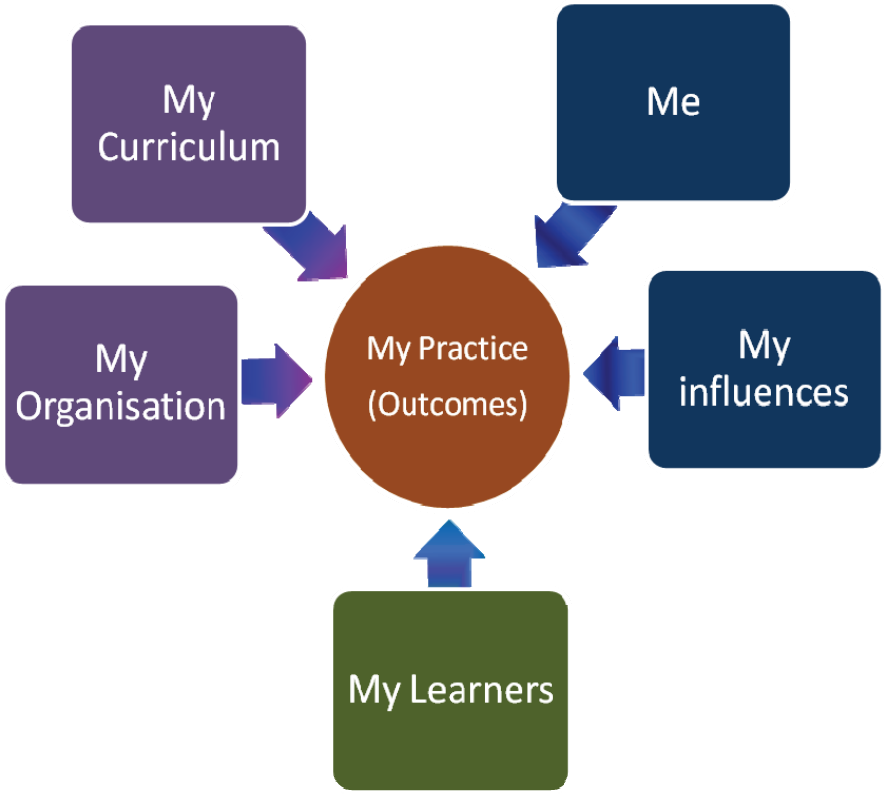
If our focus is on what goes on in FE institutions, then ISCED 3 (vocational), 4 and 5B are the most relevant ones.



A recommended sequence of the tasks from translation to the final report was provided to assist the lead partners in each country.

2.3 The survey framework

The survey consisted of 51 statements mapped against 12 indicators. The English version is given in full in Appendix 1; national coordinators translated this without significant amendment for the other four countries. The indicators and statements were positioned within a framework designed to map teachers' confidence in using ICT. The framework incorporates six themes, selected to match the environment within which teaching and learning take place, and is shown in the diagram below:



This approach recognises that ICT cannot be adopted in isolation or driven by the skills and enthusiasm of the individual practitioner.

The six themes covered:

- **Me** - What can I do with ICT and how do I acquire and update those skills?
- **My influences** - To what extent is my use of ICT shaped by my colleagues or by external influences?
- **My learners** - What ICT skills do my learners possess and what expectations do they have of using them in their learning?
- **My curriculum** - To what extent do the curriculum content and the assessment regime allow me to use ICT?
- **My organisation** - What does my organisation require me to do with ICT and what developments does it encourage?

- **The outcomes** - Does ICT have a beneficial impact on my work as a teacher? Does ICT have a beneficial impact on the results of my learners?

ICT in education and training is itself subject to external forces, notably national policy, technology trends, and investment priorities. Although these were not addressed in the practitioner survey, international partners sought to take such factors into account in their analyses of the results.

The approach also took account of indicators used in broader exercises assessing features such as institutional e-maturity and system-wide ICT focus as well as in various frameworks for 21st century skills.

Importantly, the indicators used are intended to add value to the local and national findings of Generator[4], together with the annual Becta[5] and LLUK surveys[6] and their equivalents in other countries.

2.4 Indicators within the framework

The benchmarking was designed to provide data for 12 indicators (two for each of the six themes), each assessed through practitioner responses to 51 statements based on a 5-point Likert scale ranging from 'Strongly Agree' to 'Strongly Disagree', with an additional response option of 'Don't Know'.

The themes and indicators around which the survey was designed were as follows:

Theme	Indicator
Me	My personal ICT capability My learning style
My learners	My learners' ICT capability My learners' expectations
My curriculum	Learning content Assessment models
My organisation	Infrastructure provided Organisation culture
My influences	My external influences My peer influences
Outcomes	ICT impact on my work ICT impact on my learners

[4] Generator, the technology improvement leadership tool for further education and skills. http://generatorfeandskills.com/

[5] The 2009/10 surveys can be accessed at http://research.becta.org.uk/index.php?section=rh&catcode=_re_os_sc_03&rid=17752

[6] http://www.lluk.org/workforce-data-collection.htm

Four themes (highlighted in the table) were analysed by combining the results of the relevant indicators. For two themes ('my curriculum' and 'Outcomes') the relevant indicators were each analysed separately. More on this is given in section 2.8 (Analysis) below.

2.5 The survey tool

The survey was conducted online using a tool that could accommodate different language formats. A separate translated instance of the survey, along with a glossary, was created for each participating country, each accessible from the Becta website[7]. The introductory page of the online instrument provided background and guidance. The respondents were also able to access a PDF of the survey format and the 4-page introduction to the benchmarking framework. Because respondent names were not known in advance, the option of identifying a returning respondent by IP address was adopted – though respondents typically completed in a single session.

2.6 Sampling

National coordinators and institutional managers were requested to take account of the following considerations when selecting participants:

A range of institutions, using five criteria to provide a representative sample:

- Institution types – balancing, for example, general and specialist;
- Geographical spread across national regions;
- Spread of urban and rural;
- Spread of size - based on Full Time Equivalent learners (FTEs);
- A range of levels of e-maturity - where possible based on other surveys and inspections.

A range of practitioners, using six professional and personal criteria to provide a representative sample:

- Subject area – not all IT, media or digital technology subjects; mix of science and humanities as applicable for the provider;
- Client Group - mix of vocational, academic, young adult, lifelong learning and community teachers as applicable for the provider;
- Employment – mix of full time, part time and contract staff as applicable for the provider;
- Experience – mix to include higher and lower levels of teaching service and IT experience;
- Age mix;
- Gender mix.

[7] www.becta.org.uk/feandskills/ibp

2.7 Respondents

Numbers

The initial target was to generate 500 usable responses from each participating country. However, in the time available this was unachievable and indicative target numbers were agreed that ranged from 250 to 500 practitioners, broadly reflecting the size of each country and the time available for accessing potential participants.

Four of the five countries achieved their targets, contributing to a total of 2588 submitted responses. Prior to analyzing the data, we stripped out incomplete responses and 'Don't Know' responses were additionally excluded at the individual question level. The analysis used only the 2264 fully completed responses (87%):

Responses	Austria	Denmark	England	Portugal	Sweden	All
Target	**500**	**250**	**500**	**500**	**250**	**2000**
Total received	546	226	548	1018	250	2588
Partially completed	45	59	62	84	74	324
Fully completed	501	167	486	934	176	2264

Respondent characteristics

The personal data describing the individual teacher is summarised as follows for the fully completed responses:

Characteristic		Austria (n=501)	Denmark (n=167)	England (n=486)	Portugal (n=934)	Sweden (n=176)	All (n=2264)
Gender	Female	41%	31%	53%	42%	56%	44%
	Male	59%	69%	47%	58%	44%	56%
Age	<30	15%	6%	7%	14%	7%	12%
	30-50	58%	54%	61%	74%	53%	64%
	50+	27%	40%	32%	12%	40%	24%
Employment	Full-time	26%	90%	86%	44%	40%	52%
	Other	74%	10%	14%	56%	60%	48%

In some cases the composition of the sample from individual countries differed substantially from the overall average. These variances are highlighted in the table above, and were considered in the analysis:

- **Respondent gender** - In England and Sweden the sample included a higher than average proportion of female respondents
- **Respondent age –** In Portugal the sample included a much lower percentage of respondents over the age of 50.
- **Respondent employment** – The sample of respondents in Denmark and England, included a higher proportion of full time teaching staff

These variations may not, however, be typical of the overall teacher demographic in each country: for example, the Austrian co-ordinator observed that there were few respondents from their pre-vocational schools. Had the number been greater this would have had an impact on the sample in terms of learner age and the proportion of full time staff in the sample.

Learner characteristics

Respondents were initially given a list of 15 subject areas to choose from, together with a free response option, for respondents who could not readily categorise their teaching within these subject areas. The 15 subject areas were then aggregated into four higher level areas for analysis, as shown in the table below[8]:

Categories	Subject areas	
1 – STEM	Science & Maths	Construction
	Engineering & Manufacturing	ICT
2 – Health & Education	Health, Public Services & Care	Education & Training
3 - Commercial & Business	Retail & Commercial	Business Administration & Law
	Agriculture, Horticulture & Animal Care	Preparation for Life & Work
	Leisure, Travel & Tourism	
4 - Language, culture, arts and media	History, Philosophy & Theology	Arts, Media & Publishing
	Social Sciences	Languages, Literature & Culture
5 – Other	Other	

[8] It is noted for future reference that many of the free response (Other) entries could be allocated to one of the main four areas in a more detailed analysis.

Using these four areas and including all free responses as 'Other', the data describing each teacher's primary audience is summarised below for the fully completed responses:

Characteristic		Austria n=501	Denmark n=167	England n=486	Portugal n=934	Swede n n=176	All n=2264
Subject Area	STEM	26%	35%	28%	47%	7%	34%
	Health & Education	20%	25%	18%	3%	5%	12%
	Commercial & Business	27%	6%	21%	21%	11%	21%
	Language, culture, arts & media	16%	22%	11%	12%	47%	16%
	Other	12%	13%	21%	17%	31%	18%
Course Type	Academic	12%	28%	38%	52%	26%	36%
	Vocational & Community	88%	73%	62%	48%	74%	64%
Learner Age	16-19	6%	47%	59%	17%	32%	27%
	20-29	21%	44%	9%	70%	38%	42%
	30+	31%	3%	8%	6%	12%	12%
	Combination	42%	7%	24%	7%	18%	19%

The numbers highlighted in yellow indicate sub-sets which differed substantially from the overall averages. These variances, which will not necessarily be typical of the overall subject provision and audience demographic in each country, are considered further in the analysis:

- **Subject area** – The Swedish sample include an above-average proportion of teachers in Language, Culture, Arts and Media areas, with a much lower proportion from STEM subjects than the other countries; by comparison Portuguese teachers were predominantly from the STEM area.
- **Course/learner type** – It was only in Portugal that a majority reported academic courses as their primary teaching focus.
- **Learner age** – England had a much higher proportion of teachers of 16-19 learners, whereas Austria was the only country with a high percentage of teachers of learners over the age of 30.

2.8 Analysis

Analysis framework

Statistical review of the reliability of the items in the survey instrument indicated that 8 factors demonstrated significant value in differentiating responses. Some are based on a combination of two indicators, and some are based on a single indicator. These factors, shown in the right hand column of the table below, were used in all subsequent analysis:

Survey framework		Post-completion analysis factors
Themes	**Indicators**	
Me	My personal ICT capability	Me
	My learning preferences	
My influences	My external influences	Influences
	My peer influences	
My learners	My learners' ICT capability	Learners
	My learners' expectations	
My curriculum	Learning content	Learning content
	Assessment models	Assessment
My organisation	Infrastructure provided	Organisation
	Organisational culture	
Outcomes	ICT impact on my work	7. Impact on work
	ICT impact on my learners	8. Impact on learners

Data aggregation – rationale

Experience with survey data analysis and benchmarking suggests that, whilst some analysis may require examination of the lowest level data (in this case 2264 fully complete responses), most useful findings and comparative observations arise from the aggregation of responses in to higher level grids ('scorecards[9]'). These can be more easily visualised and manipulated using colour coding to differentiate the extent to which embedding has taken place: the colour coding is explained above the relevant tables in Chapter 1.

Category analysis

This section assesses the key data provided by practitioners from all countries. The objective is to identify grounds for merging categories before aggregation of data.

[9] See Appendix 4 for details

Aggregated staff responses for each country were reviewed for three personal and three audience coding frames:

Personal	Gender	Age	Employment status
Audience	Subject areas	Courses / learner type	Learner age groups

Decisions to merge categories take account of the size of the category sample and its distribution between countries (e.g. a small sample could be dominated by a statistically significant number from a particular country). The data used in this analysis is available in Section 3.3 of this report, which also contains commentary on significant variances between countries. In all cases, the raw data has been preserved for any further or more localized analysis.

The review findings and the resulting decisions are as follows:

- **Teacher gender** – There is a good balance between genders so no aggregation of categories is required.
- **Teacher age** – No bundling of categories is required.
- **Teacher employment status** – The numbers reporting 'Sessional' status in Denmark (3%) and England (2%) were extremely low. Therefore the 'Part time' and 'Sessional' categories from the survey are combined for analysis purposes into 'Not Full Time'.
- **Course/learner type** – This may be the area of greatest underlying difference between the country systems. Whilst almost 40% of the respondents from Denmark and Sweden worked in 'Community' education, the numbers of teachers in this category in Portugal (0%) and England (2%) were extremely low. Therefore 'Vocational' and 'Community' are combined for analysis purposes in to 'Vocational Education & Training' ('VET').
- **Learner age group** – Here again, the results may represent country level systemic differences, notably relating to the major 16-19 role of General Further Education (GFE) colleges in England. Only 23 (1%) of teachers internationally reported that their primary focus was on learners over the age of 50. Therefore the groups '30-50' and 'Over 50' are combined into a single '30 plus' category.

Statistical analyses performed

Since our model had undergone no prior testing we carried out an exploratory Factor Analysis of all questions. This analysis supported the six factors in the model.

To test the model in more detail, and avoid the risk of causal relationships affecting the factors, we carried out a Factor Analyses within each of the six themes to see if there were sub-scales within these factors. Then we undertook tests of reliabilities, to see whether clusters of items from factors suggested from the Factor Analysis could be regarded as sufficiently highly inter-correlated to belong to the same scale.

Having tested the factors in our model, and confirmed their reliability, we measured the correlations between factors to test their consistency with the model. We employed

Regression Analysis, which determined the degree to which the Outcomes factor varies with changes to the input factors (My Influences, My Curriculum, My Learners etc) while other factors and the demographic variables (such as country and gender) are held fixed. In other words, it filters out the impact of each of the input factors individually. These analyses were performed on the full raw data set.

3 Partner reflections

Each country was invited to contribute a national perspective on the survey and its findings and these five individual perspectives form this chapter. Further information on the differences between education systems and structures in the five countries is given in Appendix 2.

3.1 Austria (Erich Herber)

National setting

Further education in Austria is offered through various types of providers, including public schools, public employment services, private education institutions, and adult education providers. The range of courses offered by these providers is similar to that offered by (pre-) vocational schools and colleges in secondary education. However the level of ICT usage and e-Learning differs. Governmental initiatives have sought to support ICT and technology networks in public institutions, but investment by private FE providers has been more variable, and less data is available about its impact.

Although vocational training is an important aspect of Further Education (FE) course programmes, the percentage of learners undertaking vocational training at secondary level is decreasing. The proportion of applicants to further education from schools with an academic orientation (ISCED[10] 3, e. g. AHS, BHS) is increasing. 71% of the 25-34 age group who complete their secondary education do not continue to tertiary education[11]; these learners form the bulk of FE learners in Austria. Our national survey results show that typical FE learners are over 19 years old, and undertake training primarily for vocational and community purposes (88%) rather than because of academic or other interests.

3.1.1 The institutions and their respondents

The national survey of Austria involved 24 FE institutions, including the largest national providers in the country, both public and private, as well as a number of medium and smaller training institutes. Participating partners included FE providers from all nine Federal States. A total of around 60 FE organisations were contacted to achieve the targeted number of 500 respondents. Four national and/or regional networks and associations of Further and/or Adult Education were involved in this process to provide the required mix of diversity and balance of respondents (e.g. according to size of regions).

3.1.2 Reflections on survey results in Austria - personal readiness of teachers

The personal capability of Austrian FE teachers in applying ICT in their training practice is fairly high (score 3.61) but behind the survey average (3.94).

[10] Source (2010): http://www.uis.unesco.org/TEMPLATE/pdf/isced/ISCED_A.pdf
11 source (2010): Bildung in Zahlen 2008/09, Statistik Austria (http://www.statistik.at)

Teachers in Austria use ICT most effectively when they teach groups of learners under the age of 20. Mobile devices and social media are significantly better exploited in classes with younger learners. Trainers who teach academic subjects tend to incorporate electronic communication tools more effectively into their training programmes (3.90) than do trainers of VET (3.22), and they are much more familiar with ICT tools that help them plan, record and get feedback on their personal development (4.29). While the average teacher makes good use of online resources, they report a lack of efficiency in developing their own online resources.

Among subject categories, STEM trainers had the highest ICT usage (4.48). STEM trainers were more positive about the availability of electronic learning resources, the use of subject specific IT applications, and their capacity to use ICT for professional improvement. Commercial & Business teachers achieved the lowest scores overall.

Respondents considered networks and peer group learning important. Austrian teachers were significantly more likely to improve their ICT skills from interactions with family and friends (4.09) than professional peers (3.42). They tend not to be active members of IT-related interest groups or professional bodies (2.04). There were few gender differences, although female teachers were more willing to share learning resources with peers and male teachers were more likely to exploit ICT to develop professional capabilities.

Learner expectation

Respondents gave Austrian learners the lowest score (3.48) of this European benchmark study when it comes to their individual expectations and capacity to use ICT in learning (the European average was 3.74). Although learners' access to IT devices and Internet is generally high in Austria (4.27 – above average), the use of these tools in learning is much lower (3.48). In contrast to other countries such as England and Portugal, Austrian learners were unlikely to use social media and mobile devices for learning (average below 3). However learners on academic courses were more likely to use these facilities than those on vocational courses. STEM teachers evaluated the capabilities and expectations of their learners more highly than teachers of other subject categories. Female teachers were more likely to use social media in their teaching practice and male teachers were more likely to use online learning resources and tended to have better access to Internet and ICT (these two trends had also been seen in other countries).

Assessment factors

The use of e-assessment in Austria is significantly lower (2.20) than the European average (2.86). This is true for all types of FE organisations and subject categories. Though teachers believe that their learners do make effective use of technology to reflect and to receive feedback on their learning (3.37), e-assessment seems to be hardly used to support that process (2.20). Interestingly, e-assessment was more frequently used in academic subjects and for those teaching age 16 to 19 learners (3.27). E-assessment was mainly used by these teachers for course entry or formative assessment. Other groups rarely use e-assessments in their teaching or learning practice. Some respondents reported that they considered e-assessment tools as being restricted to general questioning, not allowing for sufficient flexibility or complexity for a variety of assessment scenarios (especially for formative assessment). Most respondents reported that in Austria

e-assessment is rarely used in public examinations. However many STEM teachers report use of e-assessment in public examinations (3.06 – above the European average).

Infrastructure and culture

The technical infrastructure that is available within Austrian FE organisations is reasonably developed (3.51) but below the survey average (4.00), and with less developed use of the technology available. Trainers of Austrian FE organisations have good access to Internet connected computers both at work and at home (score 3.51).

STEM teachers reported the best technical and organisational support. E-safety and Internet security were very important in most organisations; electronic communication between staff and students is strong (3.67); and trainers feel encouraged to provide feedback on IT systems and services (3.59). However, the provision of Learning Management Systems within those organisations is below average (3.20) and trainers report that they do not feel highly encouraged by their organisations to innovate (3.29) or actively use (3.49) technology in their teaching practice. There are also obvious blocks or organisational obstacles to encouraging students to use their own ICT devices as well as in creating a culture that would encourage trainers to share good practice with others (3.42). Female teachers feel significantly less encouraged in innovating and exploiting ICT in teaching (3.38) than male teachers (3.59).

Impact on teachers and learners

Austrian teachers report that ICT has a positive impact both on their individual work (average score 3.78) and students' work (3.75). In these measures Austria comes next after England (4.55) and Portugal (4.12). Teachers perceive ICT as making their work more effective and helping them become more reflective professionals (3.96). Least impact can be seen on those who teach learners aged 20 to 29. Female teachers are less likely to think ICT can support better learning and more reflective learners.

Final conclusions

Compared with the partners of this international study, Austria is in the middle (3.77), behind Portugal (4.34) and England (3.98). Austria has both strengths and shortcomings. There are opportunities for improvement such as:

- **Learning from peers** – enhancing peer interaction and communication through internal and/or external communities or networks to better exploit existing resources (human, knowledge and learning resources) across subjects and to enhance subject areas, e. g. C&B, where organisations currently have limited resources available.
- **Learning through web 2.0** – making use of the good Internet connection and access to online resources by better exploiting Web 2.0 tools, social media and mobile devices; more encouragement for teachers and learners to use flexible tools and their own ICT devices; organisational cultures which are less restrictive and more supportive.

- **Learning by reflection** – using new e-assessment tools to the benefit of learners, by developing self-reflective skills and creating better knowledge awareness amongst learners and teachers.

3.2 Denmark (Katrin Kessinger)

3.2.1 Executive summary

The sample covered a good range of institutions, including urban and rural, various institution types (see below), and gender balance. Although we were unable to reach the target of 250 participating staff the 180 responses we did achieve was considered adequate, taking account of the size of the country and the population density.

3.2.2 Data set and practice and policy findings

We contacted the following institution types as listed below:

- universities
- colleges
- vocational and professional schools
- further education colleges
- secondary schools

The majority of the contact details were obtained through internet research. Because of a low initial response we concentrated on secondary schools – where these providers include both academic courses and vocational and employment training for 15-18 year olds.

The contact process combined several strategies:

- telephoning the institutions personally
- sending out the invitation letter/ link to formal email addresses
- sending out the link to personal email addresses of teaches
- contacting administration staff personally on the phone or face to face asking them to spread the survey with a short recommendation among their institute

We found that the third and fourth strategies were the most efficient methods to get feedback.

3.2.3 Methodology

Generating responses was difficult. Our view is that there are cultural differences regarding the participants' attitude towards surveys, interviews and data privacy. The feedback of the participants often included the positions:

- The institutions are getting many surveys and want to protect their staff from marketing mails.
- The institutions refused to spread out the survey to their staff and do not want to give away personal data.

- Some of the participants refused to write down their names etc.

Other reasons may include:

- Becta is not well known in Denmark
- Some of the participants thought they did not fit into the target group

3.2.4 Findings

Although the sample was smaller than other countries, the findings from Denmark broadly reflect those of our partners: a positive attitude of staff towards technology for learning and teaching. Danish respondents have a particularly positive view of organisational provision and the capabilities of learners. They are particularly positive about their own skills and the impact of technology on learners, but the findings show their attitudes are very close to those of colleagues in other countries and the lessons from overall findings can be applied here.

3.3 England (Kevin Donovan)

3.3.1 National setting:

- **Policy context:** College students vary greatly in age: participation is now possible from 14, although most begin after 16 and the majority are 19+. The diversity of ages and of courses offered is reflected in the complex political, financial and planning control of colleges. The Department for Children, Families and Schools is mainly responsible for learners below 19, and the Department for Business, Innovation and Skills for older learners. Funding and planning control is divided (since 1 April 2010) between the Young Peoples Learning Agency (for learners up to 19) and the Skills Funding Agency (19+). The drive towards greater use and integration of technology is exemplified by the role of Becta and other agencies and the pre-2010 government's support for the 'Harnessing Technology' strategy.
- **Character of the sector surveyed:** FE provides a choice of academic and vocational qualifications and skills to meet the needs of individuals and employers. Traditionally it was defined as what it was not – not compulsory school education and not higher education (HE). However now, of the three million students annually in English colleges, there are 82,000 14-16 years olds and 39% of the entrants to HE. Approximately two thirds of students are aged 19+. Qualifications offered in schools are also offered in FE, and diploma courses are often run collaboratively between schools and colleges.
- In March 2010 there were 352 colleges in England[12]: 229 general further education colleges, 93 sixth form colleges, 16 land-based colleges, 4 art, design and performing arts colleges, and 10 special designated colleges. There were around 140,000 full-and part-time teaching staff (with an approximate 40%/60% split).

[12] http://www.aoc.co.uk/en/about_colleges/index.cfm

3.3.2 The institutions and their respondents:

- The original intention was to select up to 20 'general FE colleges' and 2 'sixth-form colleges' and to have a representative spread therein of large, medium and small sizes (based on full-time equivalent numbers), of levels of 'e-maturity' (low, medium, high) based on a national survey in 2008, and including colleges participating in Becta's Technology Exemplar Network.
- Not all those originally invited could or would participate, so colleges on the reserve list were included. The final list of 20 includes one sixth-form college and one 'land-based' college; the remainder are general FE colleges. The male to female ratio in the sector is almost 50:50 for full-time teaching staff, while 64% of part time teachers are female. Overall the ratio is around 40% male to 60% female. In the survey it was 47.3% male/52.7% female. The respondents include more full-time staff and more teaching of under-19 students than average for the sector; such teacher may have easier access to a computer and more flexible time to complete the survey.
- Other considerations that may have impacted the data: The data collection period included a week's holiday for many colleges and concluded just before a major upheaval in the political and financial control of colleges (mentioned above). Morale of staff in the sector has also been affected by long-running disputes over pay and conditions.

3.3.3 Reflections on the data for England:

- **Personal readiness ('me', 'My influences')**: There is a high level of personal readiness, which may the high level of investment in technology infrastructure and training in English colleges over the past 10-15 years. Although some confident users lament a lack of technology investment, the wider impact is shown by the respondent who writes: "Using ICT has revolutionised my teaching over the past 10 years…. It has also helped me move from a teacher-led style to a more student friendly delivery, incorporating much more active learning. Those who don't use it much are missing so much!"
- Positive responses about skill development and the extent of peer involvement reflect the widespread professional development which has accompanied infrastructure investment. The perceived lack of time for further development is a common theme.
- **Learner expectation ('my learners')**: There are generally positive responses about student access to and use of technology although this may be based on an assumption that younger students are more conversant with technology. However, for example: "It is a godsend to my older and remote students doing their research, as they are well motivated." But: "Students' lack of internet access at home often restricts their opportunities to access additional learning resources and: It is vital not to assume that all students are equal in terms of their technical expertise"
- **Institutional settings ('My organisation')**: Many comments were favourable about their own and their college's use of ICT but some noted limitations in

availability, security restrictions, problems with student access away from the classroom, and fears about technology damaging study and research skills.

- **Curriculum factors:** There are positive examples of progressive use of technology, but: "The problem is limited computer rooms to deliver ICT lessons," and: "My subject area is hands-on practical and has very little scope for the inclusion of ICT" and a view that "ICT is useful but it is only a tool and motivation of students and a proactive teacher is more important."
- **Assessment factors:** There is widespread use of e-assessment (although less for public examinations) but comments reflected some physical limitations. Thus: "… assessment … is impaired greatly by a lack of internet availability especially during tutorial visits."
- **Impact on practitioners' work:** The written comments which supplement the data are generally positive but do stress limitations: "It's worthwhile but endlessly draining." Most noticeable is the perceived lack of development time. One comment neatly summarises a general view: "… although I think many staff have made great progress in recent years in incorporating ILT in the curriculum there is still much work to do especially in areas of e-assessment, e-safety and social media / web 2.0 technologies."
- **Impact on learners:** Students really value and learn from effective ICT resources but it must not be assumed that all are technically proficient or have access outside college.

3.3.4 Recommendations for England:

Strengths to build on:

- Large-scale infrastructure investment needs to be generalised across all colleges and supplemented and further developed over time.
- Widespread staff enthusiasm can be cascaded and/or converted into case studies and peer/network support systems.
- Awareness and use of mobile devices could be generalised.

Weaknesses to consider:

- There is still uneven/inequitable access to resources inside and outside colleges.
- Some staff may be unaware of the easy availability of learning resources.
- An assumption by some staff that ICT drives out traditionally effective teaching and learning.

Good practice to develop at national or institution level:

- Short in-house staff training courses and peer support.
- Use of mobile devices and social media.

3.4 Portugal (Rui Banha)

3.4.1 National setting

Because the extent of qualification and vocational training in Portugal is below EU averages, integrated policies have been developed address the issue. They mainly take the form of measures in Technological[13] and Employment National Plans, especially in the *Novas Oportunidades* (New Opportunities) initiative[14] and Simplex program[15]. These strategies have had a positive impact on education and training, lifelong learning and the development of the information society. Over the past four years, Portugal has become the first EU-27 country to implement e-government facilities, the trade technological balance attained a surplus, all schools acquired ICT infrastructure, equipment and software to support educational needs (e-learning platforms, access to several electronic libraries and extensive learning content) and there has been an huge public distribution of laptops with cheap Internet broadband access to all students in “e-escolinhas” (first to fourth years of education), “e-escolas” (fifth to twelfth years of education), teachers (“e-professor”) and to adults enrolled in training paths (“e-oportunidades”). Adults have seized the opportunity to enrol at ‘New Opportunities Centres’ - which provide a ‘recognition, validation and certification of competencies or guidance to a training programme; about 1.2 million have signed up since 2006.

Despite these strong measures, Portugal’s level of Internet access (48%) and broadband connections for households (46%) were considerably below EU averages (65% and 56% respectively). However according to Eurostat data, indicators are more positive on the use of ICT by enterprises, equivalent to the EU-27 average.

3.4.2 Character of the sector surveyed

Technological Specialization Courses (TSC) is a post-secondary, non-tertiary form of training lasting approximately one year. It offers level 4 vocational qualifications and a technological specialisation diploma. It is designed to enable young people and adults to complete their upper secondary education, learn vocational competences relevant to the employment market, acquire additional vocational skills or take tertiary courses in technological areas (60 to 90 ECTS). Its syllabus includes general and scientific, technological and on-the-job training. There are around 90 institutions - universities, polytechnics, technological schools, tourism schools, vocational training centres, etc – and more than 3,000 teachers involved.

Data was obtained from 76 institutions of a total of 93. Almost a third of TSC teachers responded, so the sample can be considered quite representative.

[13] http://www.planotecnologico.pt/default.aspx?idLang=2&site=planotecnologico

[14] http://www.en.anq.gov.pt/

[15] http://www.simplex.pt/english.html

3.4.3 Reflections on the data from Portugal

Portuguese teaching staff showed higher scores on many indicators than the averages calculated across the participating countries.

- **Personal readiness:** Most individuals rated their personal capability highly. This was particularly true of capability to use office and specific software, the internet and electronic communications. Influences are considered important, including external influences, the influence of co-workers, and friends and family. However, belonging to ICT associations was less highly valued. In general, there are no striking differences between different social groups of course types, though younger teachers teaching STEM courses (particularly ICT) tended to get higher scores.
- **Learner expectations:** Student use of specific software and online resources was highly evaluated. Respondent felt students had more difficulty with the effective use of social networks for learning. Teachers consider that students had good access to computers with internet connections and a good chance of using ICT programmes for learning purposes. Younger teachers in STEM areas tend to have the highest opinion of their students' capabilities and expectations.
- **Institutional settings:** In respect of infrastructure, the level of internet access at work, and access at home to the school's information system, were highly evaluated. Regarding culture, electronic communication between teachers and students, and encouragement from the organisation to innovate in the use of technologies were well evaluated. However the openness to criticism of ICT systems and services and the encouragement of students to use their own ICT hardware were generally less favourably evaluated. There is very little variation between the different categories of respondents and the type of organisation, though ICT teachers, STEM teachers, and Commerce & Business teachers were all rather more positive than average.
- **Curriculum factors:** An analysis of the curriculum, with special focus on learning content, shows that most of the respondents believe that conditions are favourable for incorporating ICT into their teaching activities, but felt it could be difficult to gain access to electronic learning resources. Most favourable responses were from the younger STEM teachers with younger students.
- **Assessment factors:** Opinions on e-assessment were significantly less favourable than any other aspect of technology for learning. The most favourable evaluation was in the use of e-evaluation for educational and programme assessment; the use of e-evaluation in state exams was the least favourable. The youngest teachers, working part-time and in STEM vocational courses were more likely to express a favourable opinion.
- **Impact on practitioners' work:** Of all the indicators analysed, those linked with the impact on the teacher's work generate the most favourable responses. The highest levels of agreement were with the statement that ICT makes work more effective. This was high for all categories of teacher. The impact of technology on self-evaluation and reflection was somewhat lower.
- **Impact on learners:** Opinions of the impact of technology on students were also very positive. The teachers were particularly positive about ICT making

students' studies more efficient, effective and satisfactory. Evaluation of the development of students' reflexive skills was slightly less positive. Teachers feel that ICT functions as a support tool rather than a resource for personal development. The younger teachers, those working part time and in vocational courses, have the highest averages.

3.4.4 Recommendations for Portugal

Strengths to build on:

- Large-scale infrastructure investment needs to be generalised across all
- Reinforcement of the network of establishments with appropriate physical, technological and human resources and good regional distribution for provision of TSC (technological specialisation courses);
- Consideration of TSC as an expanding form of education and training with great growth potential (especially in tertiary education establishments);
- Further development of partnerships between education and training establishments (from upper secondary schools to tertiary education institutions) and companies, corporate and socio-professional bodies and agreements between non-tertiary education establishments and tertiary education institutions on the provision of TSC.

Weaknesses to consider:

- The fact that TSC fall under the supervision of different authorities (4 ministries) means that it has not yet been possible to set up an organisation or platform for producing overall statistics on them;
- The syllabuses of most of the courses do not comply with the qualification references in the National Catalogue of Qualifications;
- It is difficult to establish regular evaluation procedures for TSC, generally and for each school (e-evaluation is still a work in progress).

Good practice to develop at national or institution level:

- Creation of a statistical procedure, which would allow to produce and publish data on TSC every year;
- Monitoring the progress of students who have completed TSC (in further studies or access to employment) and of agreements between universities and non-tertiary training bodies;
- External evaluation of all dimensions of TSC (including the use of ICT in the teaching and learning process), that is required by law to perform until 2011.

3.5 Sweden (Katarina Ekstrand)

3.5.1 Character of the sector- the institutions and their respondents:

Folkuniversitetet courses are dominated by culture, music, handicrafts and art and crafts, but also include vocational education in economics, marketing and environmental engineering. Languages represent 10 % of activity. The majority of teachers responding worked part time.

3.5.2 Reflections on the data for Sweden

Institutional settings and curriculum factors: although the technical infrastructure exists, there is a lack of experience and software to support educational programs, particularly in subjects such as music and arts and crafts which are not traditionally dependent on technical solutions. In these subject areas traditional classroom pedagogies are still vital.

Personal competency: There is a high degree of teacher autonomy - teaching methods, literature, and curriculum are not set centrally. There is widespread conservatism in teaching practice, where traditional methods are widely favoured. Initiatives or ideas from particular teachers are not always integrated and spread amongst other staff as well as they could be. Because of these factors, skills developed by individuals are frequently lost when teachers leave the organisation.

3.5.3 Recommendations for Sweden

- Further competence development, taking into account the Swedish philosophy of allowing teachers a high degree of autonomy in pedagogic decisions.
- Greater support for staff in encouraging energy, willingness, enthusiasm in relation to ICT.
- Improving administrative routines to make it easier for teaching staff to develop new ideas about ICT in new subjects.
- Facilitating increased competence in ICT through informal and networking teacher training education.
- Working on a national basis to make sure that no region or department risks being left behind.

4 Insights

The primary focus of this study has been on developing an instrument, establishing links with international partners, collecting and analyzing data, and drawing conclusions from it. Alongside these there have been extensive opportunities for dialogue and reflection between partners, within the project team, and with Becta and its strategic partners.

Taking these together we offer the following broad practical insights, which are distinct from the survey-based findings in the first chapter. We have categorized these under four headings. We believe that Becta and its partners could usefully prioritise follow up action on each of the insights.

4.1 General

Comparing progress and perspectives between countries can be a valuable activity, which can support the spread of innovation and know-how. The data collected may have more to say about the challenges which all countries have in common, than about the differences. With its international partners, Becta should examine options for further collaborations of the kind needed to undertake this study.

Although debate continues about the impact of technology on learning, learners and teachers **believe** that IT has a beneficial impact on the effectiveness and efficiency of their learning and their work, and on the satisfaction and pleasure gained. Learners now expect IT to figure extensively in their learning. For these reasons the case for effective deployment of technology in learning and in its management and organisation is difficult to contest.

4.2 Learners

Social media and mobile technologies are emerging as important components of the infrastructure for learning, alongside more established components such as standard office IT applications, subject-specific applications, Internet connected desktop and laptop PCs, and the World Wide Web. Practitioner awareness of, and fluency in both social media and mobile technologies is less well developed than for more established technology.

Access by learners to computers on a flexible basis (especially laptops), and the opportunity to use their own devices in their learning are viewed as enabling the effective use of ICT in teaching and learning.

4.3 Curriculum

There is strong evidence of a divide between the use of ICT and Technology Enhanced Learning in STEM subjects and its use in other subject areas, especially in the arts and humanities. Given the pervasive role of ICT in all areas of 21st century life, we suggest that this gap be formally investigated on a European basis.

With some exceptions in STEM subjects, the use of e-assessment lags behind the general adoption of ICT in learning.

The development of digital resources and especially those that are accessible online emerges as a barrier faced by many teachers. There is a need to determine what combination of professional development, learning technologist support, third party developments (including support for Open Educational Resources) would best contribute to overcoming this barrier.

4.4 Teachers

Teaching staff do not feel they are holding back the take-up and embedding of digital technologies in vocational learning. Their recognition of the value added by technology needs to be weighed against local and systemic inhibitors such as the availability of on-line learning resources, the level to which learners are equipped, and the requirements of the curriculum.

As in other areas of the economy, informal learning (from friends, peers, and family members) is of growing importance as compared to formal training. This has substantial implications for how institutions manage their professional development and training programmes. It also raises the opportunity for the facilitation of peer networks, which may be either face-to-face or online, and linked to trusted professional organisations.

There is widespread recognition by teachers that IT has a positive impact on their working practices. We suggest that institutions should be supported, perhaps through the next survey, in developing a grounded understanding of the working practices that are valued and which could therefore inform their future administrative and learning systems development.

4.5 Messages in a European context

While the national reports indicate ways forward in each of the partner countries, there are a number of common issues where further research and/or actions are suggested by the findings of this project;

- With such positive views on the potential impact of technology on their own practice and those of their learners, research to explore the details of infrastructure and practice that are most effective in supporting positive attitudes and developing practice should be identified;
- Further detail is needed on the mechanisms used by peer groups to support professionals in their work and the potential for national and multinational services to promote and sustain these methods of learning;
- Mechanisms to allow learners to utilise their skills should be considered in the light of the positive evaluation of their skills by staff
- Networking and collaboration across national boundaries should be developed to enable the sharing of best practice with technology.

Appendix 1 – Benchmarking survey instrument [English]

This Appendix replicates that survey instrument that was translated in to each country's preferred language prior to entry in to the Surveymonkey online format. The translations are all available in PDF format at www.becta.org.uk/feandskills/ibp

1.1 English text

About this benchmarking survey

On this introductory page you will find information on:

- our objectives
- the survey questions
- anonymity of responses
- contacting the organisers
- survey dates

Our objectives

Becta, the UK agency responsible for educational technology, wants to compare performance in the deployment of ICT in the further education and skills sectors across a range of European countries. Becta is therefore working with partners in 5 European countries to undertake a baseline benchmarking survey of teaching staff in February 2010, involving online responses from around 500 teaching staff from each country. The objective is to produce and share a report on the benchmarking results and examples of good practice.

You can download a short document www.becta.org.uk/feandskills/ibp that explains the underlying rationale and the approach taken in the design of this survey and its benchmarking framework.

Becta holds the copyright to this survey; if you or your organisation would like to use the survey again at a later date, please contact Becta - Telephone: [+44] 024 7461 6994 or Email: customerservices@becta.org.uk

The survey questions

The benchmarking survey consists of 12 simple positioning questions (Sections 1 & 2), followed by your responses to 50 statements about your use of ICT in teaching and learning (Sections 3 – 8). All 50 statements require a single 'tick' response on the 5 point scale of 'Strongly Agree' to 'Strongly Disagree' (the Likert Scale). There is just one optional free text response at the end, providing opportunity for you to make any further observations. Finally, you can provide your email address if you wish to receive a copy of the analysis report.

Respondents often like to review the questions in advance, and we strongly recommend that you do this by downloading the full survey as a 12 page PDF file - you will find this at

www.becta.org.uk/feandskills/ibp. In particular you will need to refer to the glossary whilst completing the survey; this forms page 2 of the PDF file.

We expect each section to take around 90 seconds – and therefore please allow 12 minutes for the complete survey. If you have to take a break, you will be automatically returned to the same section, unless you log on from a different location.

Anonymity of responses

You are only asked to provide your name as a record identifier and as an indication of authenticity. It is our firm undertaking that names or other forms of individual identification will not be used in any disclosure, sharing or analysis of the survey data:

- Names will be removed from the raw data provided to Becta, EIfEL, national partners or other interested parties
- All data used in reports will be at aggregated levels (e.g. by country, by gender, by age group, etc)

Contacting the organisers

This international benchmarking survey is led by Becta (www.becta.org.uk), working with EIfEL (http://www.eife-l.org) as European coordinator and with lead partners in each of the participating European countries. The survey data will be processed and reported on by Sero Consulting (www.sero.co.uk).

If you have any queries about the survey, please contact your country lead by email. In < Country name>, this is <Organisation name> : <email address>.

Survey Dates

The survey will be open for responses from 25 January 2010 and will close at the end of 24 February 2010

Section 1 - About you

Please tell us details about yourself that will assist our analysis of the survey responses:

- Your Name - [open]
- Your Gender – Female, Male
- Your Age – Under 30, 30-50, Over 50
- Your mode of employment – Full time, Part Time, Sessional (Contract, Casual)
- Your Institution (e.g. College) - [open]
- Your Country – Austria, Denmark, England, Portugal, Sweden

Section 2 - About your work

Please tell us about your subject area and your learners, which provides important context for your answers in the rest of the survey.

Use the Primary questions to describe the majority of your teaching.

- The primary Learner Type that you teach – Academic, Vocational, Community
- The primary Learner Age – 16-19, 20-29, 30-50, Over 50, Combination
- The Primary Subject Area – from list (below)

Only answer the Secondary questions if another Subject Area or Learner Type involves more than 20% of your teaching time

- The secondary Learner Type that you teach – same list
- The secondary Learner Age – same list
- The secondary Subject Area – same list

Your subject area	
Health, Public Services & Care	Arts, Media & Publishing
Science & Mathematics	History, Philosophy & Theology
Agriculture, Horticulture & Animal Care	Social Sciences
Engineering & Manufacturing Technologies	Languages, Literature & Culture
Construction, Planning & Built Environment	Education & Training
Information and Communication Technology	Preparation for Life & Work
Retail & Commercial Enterprise	Business, Administration & Law
Leisure, Travel & Tourism	Another Subject Area

Section 3: Yourself – your capabilities and learning style

All the remaining questions are based on statements to which you are asked to select the appropriate response from the same 5 point scale.

Capability	1.1	I make effective use of **standard office IT applications** in my everyday activities
Capability	1.2	I make effective use of **subject-specific IT applications** in my teaching
Capability	1.3	I make effective use of the Internet for research and locating **learning resources** and lesson plans
Capability	1.4	I make effective use of **electronic communication** to support my learners
Capability	1.5	I make effective use of **social media** to support learning activities
Capability	1.6	I make effective use of **mobile devices** to support learning activities
Capability	1.7	I can teach effectively online
Capability	1.8	I make effective use of IT to develop **learning resources** for use in my teaching
Capability	1.9	I am effective in developing **online resources**
Learning	2.1	I have access to professional development opportunities to support my use of IT in teaching
Learning	2.2	I am confident in developing my own ability in the use of IT in teaching and learning
Learning	2.3	I share and seek feedback from my peers on **learning resources** and lesson plans
Learning	2.4	I use IT to plan, record and get feedback on my professional development

Section 4: Your learners – their capabilities and expectations

Capability	3.1	My learners make effective use of **standard office IT applications**
Capability	3.2	My learners make effective use of **social media** in their learning
Capability	3.3	My learners make effective use of **mobile devices** in their learning
Capability	3.4	My learners are confident in using a variety of online learning resources
Capability	3.5	My learners use technology to reflect and to receive feedback on their learning
Expectation	4.1	My learners have good access to **IT devices** that are connected to the Internet
Expectation	4.2	My learners expect to use IT applications extensively in their learning
Expectation	4.3	Learners who need support in their use of IT have good access to **assistive technology**

Section 5: Your curriculum – its learning content and assessment

Learning Content	5.1	There is good scope to incorporate use of IT in the subjects I mainly teach
Learning Content	5.2	Electronic **learning resources** are widely available in the subjects I mainly teach
Assessment	6.1	There is significant use of **e-assessment** for **diagnostic** purposes at the start of courses
Assessment	6.2	There is significant use of e-assessment for **formative** purposes
Assessment	6.3	There is significant use of e-assessment for **summative** purposes
Assessment	6.4	There is significant use of e-assessment in public examinations

Section 6: Your organisation – its infrastructure and culture

Infrastructure	7.1	I have access to an Internet-connected computer at work, where and when I need it
Infrastructure	7.2	I have good access to my organisation information system from my home
Infrastructure	7.3	My organisation provides a **learning management system**
Infrastructure	7.4	My organisation provides good IT technical support
Infrastructure	7.5	**E-safety and Internet security** are very important in my organisation
Culture	8.1	**Electronic communication** is part of everyday interaction between staff and students
Culture	8.2	My organisation requires me to make active use of IT in teaching and learning
Culture	8.3	My organisation encourages innovation in technology use
Culture	8.4	My organisation encourages feedback on the performance of its IT systems and services
Culture	8.5	I am encouraged to seek out and share good practice in technology use
Culture	8.6	My organisation encourages students to use their own **IT devices** in learning

Section 7: Your influences – external sources and peers

External	9.1	I keep up to date with new technology developments which might affect my work
External	9.2	I am an active member of one or more IT-related interest groups or professional bodies
External	9.3	I take account of the **demands of the labour market** in how I use IT in my courses
Peers	10.1	I discuss technology developments and experiences with my peers and learn from them
Peers	10.2	I improve my IT skills through interactions with family and friends

Section 8: The results – Impact of IT on your work and your students' work

Impact on work	11.1	IT makes my work more effective, enabling me to do what I need to do
Impact on work	11.2	IT makes my work more efficient, enabling me to do things more quickly or with less effort
Impact on work	11.3	IT helps me to be a better, more reflective professional
Impact on work	11.4	IT makes my work more satisfying, pleasant and rewarding
Impact on learners	12.1	My learners use of IT makes their study more effective
Impact on learners	12.2	My learners use of IT makes their study more efficient
Impact on learners	12.3	My learners' use of IT contributes to making them better, more reflective learners
Impact on learners	12.4	My learners' use of IT makes their study more satisfying, pleasant and rewarding

Anything else?

Please use this free text section if there is anything else you wish to tell us

Thank you

Becta and EIfEL greatly appreciate for your participation in this benchmarking survey. If you would like to receive a copy of the analysis report, including country comparisons, please provide your email address here:

1.2 English glossary

Source / comment	Term	Definition
BS 8426	assessment	test, examination or similar, the primary purpose of which is to assess a learner's knowledge, understanding or skills in a defined area
PAS 78	assistive technology	hardware or software used to adapt or make computer systems and services accessible to people with disabilities or learning difficulties
Team	demands of the labour market	local and/or national demand for employees with particular qualifications and skills
Team	diagnostic	helping to find out how much a learner knows, how experienced a learner is, or what skills a learner has
Team	e-assessment	an assessment that is provided using ICT
Team	electronic communication	personal and group messaging and information exchange services such as email, SMS and forums
Team	e-safety and Internet security	protecting people, in particular children, young people, and those with cognitive impairments, from harm on the Internet
Deriving from BS 8426	formative	guiding the learner to improve their performance on a task
Team	IT devices	computer hardware such as laptops, netbooks and internet-connected consoles
BS 8426	learning management system	information technology system used to enable the provision of learning materials and support processes to learners, to help learners, tutors and administrators track the learners' progress, and to facilitate the convenient updating of learning materials.
Team	learning resources	electronic content that can be used by a teacher or learner as part of a course
Team	mobile devices	Hand-held computing devices with touch-screens or keyboards that can connect wirelessly to the Internet or to a mobile telephone network
Deriving from BS 8426	online resources	online content that can be used by a learner as part of a course, and which can be accessed using a networked device

Team & http://tinyurl.com/dqt86	social media	Web-focused (or Web 2.0) software and services such as browsers, RSS, wikis, Twitter, YouTube, and flickr, that allow users to create and share content and to communicate on-line
Team	standard office IT applications	desktop software applications such as browser, email, spreadsheet, text processing or presentation software
Team	subject-specific IT applications	software tools and applications that are specific to a subject, for example CAD in engineering, video-editing in media, accounting and finance systems for business, booking systems in hospitality
Team	summative	judging and recording the learner's performance

Appendix 2 - Further Education and Skills Sector country comparisons

2.1 Structure of post-compulsory education

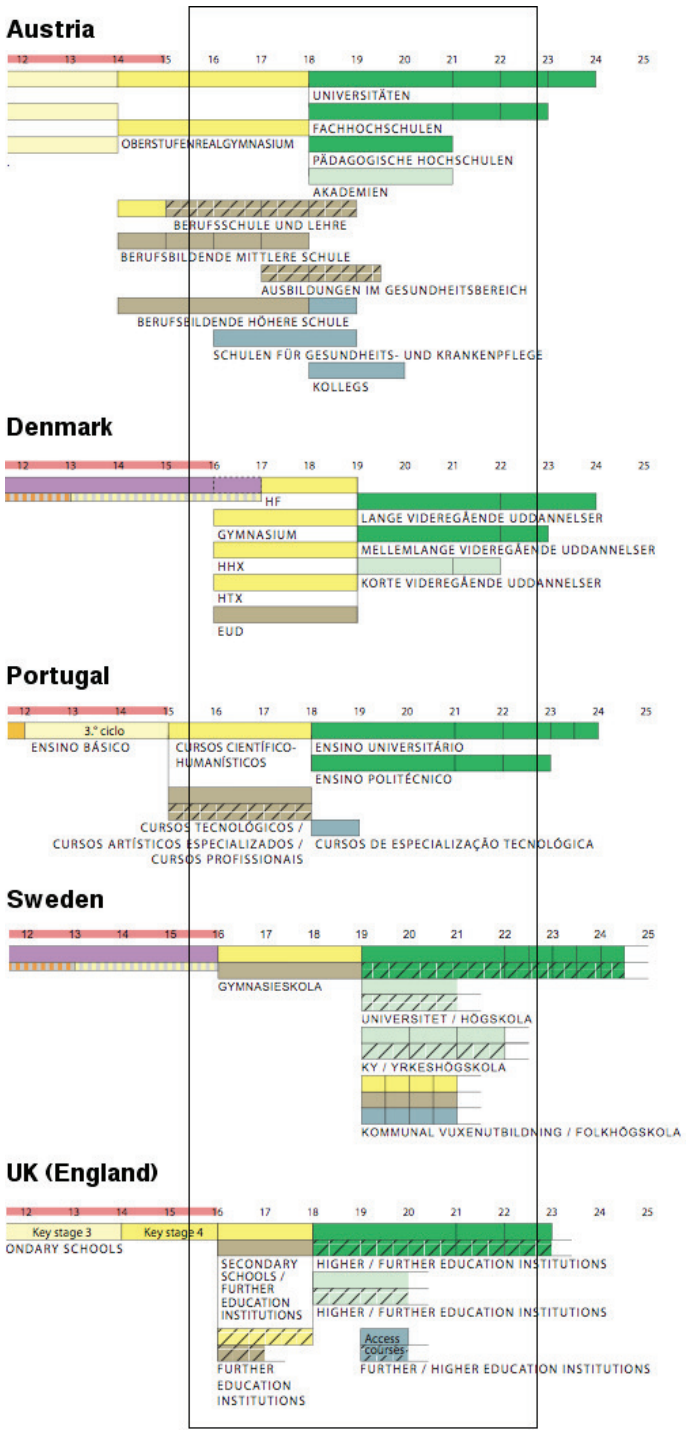
Tertiary education is structured differently in each country. The figure on right shows the strands of post-compulsory education in the five countries that took part in the benchmarking project.

The strands of education in each country are classified by their ISCED level (International Standard

- Single structure (no institutional distinction between ISCED 1 and 2)
- Lower secondary general - ISCED 2 (including pre-vocational)
- Lower secondary vocational - ISCED 2
- Upper secondary general - ISCED 3
- Upper secondary vocational - ISCED 3
- Post-secondary non-tertiary - ISCED 4
- Tertiary education - ISCED 5B
- Tertiary education - ISCED 5A
- Part-time or combined school and workplace courses

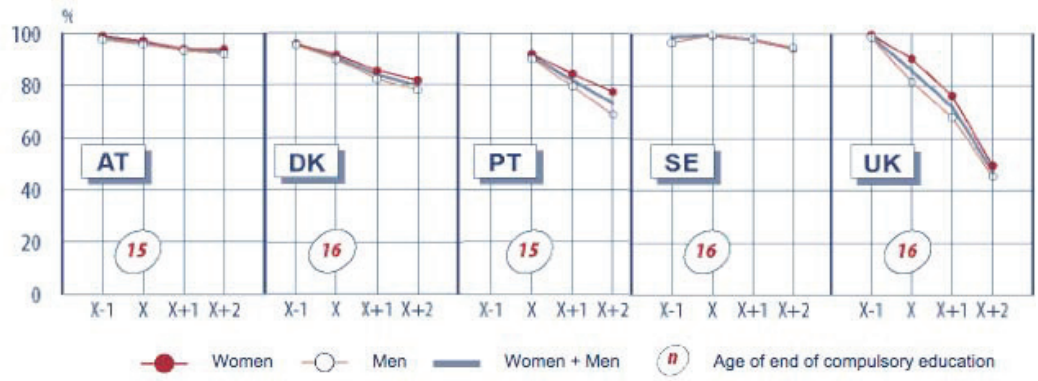
5A is “largely academic orientation”, while 5B is “more practical, technical or even vocational orientation”.

If our focus is on what goes on in FE institutions, then ISCED 3 (vocational), 4 and 5B are the most relevant ones.



2.2 Participation rates by age

Participation rates decline at different rates at the end of compulsory education. Participation rates decline particularly slowly in the Czech Republic, Ireland, Latvia, Lithuania, Austria, Poland, Slovenia, Finland, Sweden, Liechtenstein and Norway: in these countries, they still exceeded 85% in the second year after the end of compulsory education. In contrast, in Germany, Malta and the United Kingdom less than 50 % of young people are still enrolled in education two years after the end of compulsory education.

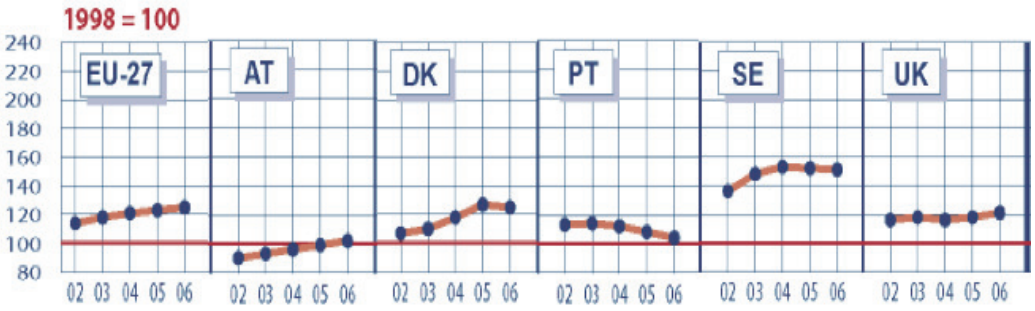


Source: Eurostat, UOE and population statistics (data extracted July 2008).

AT = Austria DK = Denmark PT = Portugal SE = Sweden

2.3 Growth in number of students

The student population in tertiary education has been rising steadily in the European Union, but not uniformly across all countries. Between 1998 and 2006, the number of students in the European Union grew in these years by 25 % (2.8 % annual growth rate).



Source: Eurostat, UOE (data extracted July 2008).

EU-27 = average across EU AT = Austria DK = Denmark PT = Portugal SE = Sweden

2.4 Relevant educational provision

Austria

Tertiary education is offered by universities (*Universitäten*), universities of applied science (*Fachhochschulen*), colleges of education (*Pädagogische Hochschulen*) and colleges of other professions (*Akadamien*) including clinical-technical, medical, social or military disciplines (see the graphic at the start of this section). Further **post-secondary education** and training is provided by public and private schools in the form of *Kollegs* (ages 18-20) and/or adult education programmes.

Vocational training: *Berufsbildende mittlere Schulen* and *Berufsbildende höhere Schulen* are technical and vocational schools and colleges (14-19) which prepare for specific professional careers and/or tertiary education. Additionally, *Berufsbildende Pflichtschulen ("Berufsschulen")* offer part-time vocational training parallel to an apprenticeship. These schools provide compulsory courses after pre-vocational schools (*Polytechnische Schulen*). At pre-vocational schools, the focus lies on vocational orientation and basic vocational training in subject areas according to broadly scoped occupational fields such as technical/commercial occupations, trade/clerical occupations, as well as the service industry and tourism. Additionally, *Schulen für Gesundheit und Krankenpflege* or *Ausbildungen im Gesundheitsbereich* provide education and vocational training in paramedical, health and nursing disciplines.

Denmark

Vocational upper secondary education (*Vocational education and training (EUD) Basic social and health training (SOSU)*) Vocational education and training combine general and vocational education at a vocational college with on-the-job training. Basic social and health training and agricultural, maritime and other comparable forms of education take place at specialised schools.

Academies of professional higher education *(Erhvervsakademie)* offer 2-year academy profession programmes in fields such as business, technology, and IT. They combine theoretical studies with a practically oriented approach and are usually completed with a project work of 3 months' duration.

Specialised colleges and centres for higher education/university colleges *(Mellemlange Videregående Uddannelser)* offer 3-4 year professional bachelor programmes in fields such as business, education, engineering and nursing. Theoretical studies, practical training through internships and a bachelor project are common parts of all programmes.

Note: in academic year 2008/09, a new structure of the Danish vocational education took effect. The reform entails among other things that study programmes have been divided into 12 main areas and new plans of action and learning objectives have been created. This structure is not reflected in this document as I do not have further details.

England

Note: this study is concerned with the English context only, not that of other UK countries – data for the UK as a whole is reported in the previous sections as it is not available for England only.

Sixth Form Colleges offer general / academic education, along with some courses in vocational / applied subjects.

General Further Education Colleges place a greater emphasis on vocational courses although they also offer general courses.

Specialist Colleges provide courses in a specific area of the curriculum such as art, or in a vocational area such as agriculture.

Tertiary Colleges offer both general and vocational education.

As well as state-funded FE colleges, there are a significant number of private and third sector providers in the FE sector. In 2007/08, there were 373 FE colleges, of which 95 were sixth-form colleges.[16]

Portugal

Cursos Tecnológicos (Technological Courses), *Cursos de Ensino Artístico Especializado* (Specialised Artistic Courses) *and Cursos Profissionais* (Vocational Courses) count as Upper Secondary/Vocational (ISCED 3) and run from ages 15-18.

Cursos de Especialização Tecnológica – CET (Specialised Technological Courses - STC) are ISCED 4 and run from ages 18-19.

STC training plan is composed by the following training components: a general and scientific; a technological; and a labour context. STC aims to: deepen the scientific and the technological knowledge in a certain training area; develop skills for professional performance; proceed with higher education studies; and to do a vocational requalification.

All those modalities are integrated into the National Qualifications System (NQS), created in December 2007, which reflects the achievement of a set of policy measures in education and training, which correspond to the guidelines of international organisations (EU, OECD).[17]

[16] Source:
http://eacea.ec.europa.eu/education/eurydice/documents/eurybase/national_summary_sheets/047_UN_EN.pdf
http://eacea.ec.europa.eu/education/eurydice/documents/eurybase/structures/041_UKEngland_EN.pdf
[17] Source:
http://eacea.ec.europe.eu/…
http://www.en.anq.gov.pt/

Sweden

The public school system (*Gymnasieskola*, aged 16-19) includes post-secondary training programmes, supplementary education programmes (a complementary education at upper secondary level within certain subjects and vocational fields), advanced vocational education and training, municipal education for adults with learning disabilities and Swedish tuition for immigrants.

The Government has decided to introduce a pilot project for upper secondary apprenticeship training. The project, where at least half of vocational education should be located at workplaces, covers education starting July 2008 – June 2011. University colleges (*Högskola*) provide some vocational post-19 education.[18]

[18] Source: http://eacea.ec.europa.eu/education/eurydice/documents/eurybase/national_summary_sheets/047_SE_EN.pdf

Appendix 3 - Participating institutions

This list does not include those organisations whose staff participated in the survey, but who wished to remain anonymous.

3.1 Austria

AK-Bildungscenter
Ausbildungszentrum der Österreichischen Papierindustrie
Ausbildungszentrum West für Gesundheitsberufe der TILAK GmbH
BBRZ Reha GmbH, AVL-INSTITUT
BFI Burgenland
BFI Oberösterreich
BFI Wien
Burgenländisches Volksbildungswerk
Die Wiener Volkshochschulen GmbH - Rosa-Mayreder-College
e-LISA academy - Education Highway
EPICT (ein Projekt des bm:ukk und der Pädagogischen Hochschulen Österreichs)
FAB Wien
IFM - Institut für Management
ipcenter.at GmbH
KMU Akademie und Management GmbH
Ländliches Fortbildungsinstitut Steiermark
LFI Niederösterreich
LFI Vorarlberg
Oberösterreichisches Volksbildungswerk
SPC GmbH
Volkshochschule Meidling, WIFI Österreich

3.2 Denmark

Århus Statsgymnasium

KEA.DK (Int.)

Danmarks Medie- og Journalisthøjskole

Københavns Erhvervsakademi

RUC

Copenhagen School of Design & Technology

Roskilde University

Slagelse Gymnasium

Efterslægten

Herlufsholm Skole

Brøndby Gymnasium

Sorø Akademi

Handelsskolen Minerva

Egå Gymnasium

Birkerød Gymnasium
Avedøre Gymnasium
Syddansk Erhvervsskole
Århus Akademi
Hasseris Gymnasium
Odense Katedralskole
IBOS
Nørre Gymnasium
Frederiksberg Gymnasium
Gammel Hellerup Gymnasium
Marselisborg Gymnasium
Sct. Knuds Gymnasium
Langkær gymnasium
Center for specialundervisning, Roskilde Kommune
Gladsaxe Gymnasium
Københavns Universitet (Datalogisk Institut)
Midtfyns Gymnasium
Mercatec
Ribe Handelsskole
Struer Statsgymnasium
Midtfyns Gymnasium
Testrup Højskole
Selandia
VUC FYN & FYNs HF-kursus
Midtfyns Gymnasium
Danmarks Medie- og Journalisthøjskole
Grenaa Gymnasium
Engelsholm Højskole
UCN, læreruddannelsen
SDU
University College Lillebælt, Socialrådgiveruddannelsen
Ålborg Universitet
Syddansk Universitet
Copenhagen Business School
Alssundgymnasiet Sønderborg
Læreruddannelsen i Aalborg, UCN
Esbjerg Gymnasium og HF

Roskilde University
Grindsted Landbrugsskole
Tietgen Handelsgymnasium
Ribe Handelsskole
Institut for Naturfagenes didaktik
Institut for Statskundskab, SDU
Medieskolerne
University College Lillebælt, Odense
UCL, Radiografuddannelsen
Syddansk Erhvervsskole
Dalum Landbrugsskole
Erhvervsakademi Lillebælt
UCC Nord Afspændingspædagoguddannelsen

3.3 England

Abingdon and Witney College
Alton College
Bournville College
Bradford College
City and Islington
City College Norwich
Gloucestershire College
Harrogate College
Hull College
Kirklees College
Myerscough College
New College Durham
Northampton College
Northumberland College
Rotherham College of Arts and Technology
South Devon College
St Helens College
Thanet College
The Oldham College
Warwickshire College

3.4 Portugal

Tutelage	School
Ministério da Educação/ Agência Nacional para a Qualificação	Escola Secundária do Montejunto
	INETESE – Associação para o Ensino e Formação de Castelo Branco
	INETESE – Associação para o Ensino e Formação de Évora
	INETESE – Associação para o Ensino e Formação de Lisboa
	INETESE – Associação para o Ensino e Formação de Leiria
	INETESE – Associação para o Ensino e Formação de Angra do Heroísmo
	INETESE – Associação para o Ensino e Formação de Ponta Delgada
	INETESE – Associação para o Ensino e Formação do Funchal
Ministério da Economia e Inovação	Associação para a Formação Tecnologia e Profissional da Beira Interior (AFTEBI)
	Associação para Escola Superior de Biotecnologia da Universidade Católica (AESBUC)
	Associação para a Formação Tecnológica, Engenharia Mecânica e Materiais (AFTEM)
	Escola Novas Tecnologias dos Açores (ENTA)
	Escola Tecnológica das Pedras Naturais (ESTER)
	FORESP – Associação para a Formação e Especialização Tecnológica
	NOVOTECNA – Associação para o Desenvolvimento Tecnológico
	EHT (Escola de Hotelaria e de Turismo) do Algarve
	EHT de Vila Real de Santo António
	EHT de Portimão
	EHT de Coimbra
	EHT do Oeste (Óbidos e Caldas da Rainha)
	EHT do Fundão
	EHT do Estoril
	EHT de Lisboa
	EHT de Setúbal
	EHT do Porto
	EHT de Viana do Castelo
	EHT de Douro-Lamego
Ministério da Ciência, da Tecnologia e do Ensino	Universidade do Açores
	Universidade do Algarve
	Universidade Aveiro
	Universidade de Évora

Superior	Universidade do Minho
	ISCTE/ Instituto Universitário de Lisboa
	Escola Náutica Infante D. Henrique
	Instituto Politécnico de Beja
	Instituto Politécnico de Bragança
	Instituto Politécnico de Castelo Branco
	Instituto Politécnico do Cávado e do Ave
	Instituto Politécnico de Coimbra
	Instituto Politécnico da Guarda
Ministério da Ciência, da Tecnologia e do Ensino Superior	Instituto Politécnico de Leiria
	Instituto Politécnico de Portalegre
	Instituto Politécnico do Porto
	Instituto Politécnico de Santarém
	Instituto Politécnico de Setúbal
	Instituto Politécnico de Tomar
	Instituto Politécnico de Viana do Castelo
	Instituto Politécnico de Viseu
	Universidade Autónoma de Lisboa
	Universidade Lusíada de Vila Nova de Famalicão
	Universidade Portucalense
	Universidade Fernando Pessoa
	Universidade Lusófona
	Escola Superior de Artes Decorativas/ IAO
	Escola superior de Design (IADE)
	Escola Universitária das Artes de Coimbra
	Instituto de Estudos Superiores Financeiros e Fiscais (IESF)
	Instituto Superior de Administração e Línguas (ISAL)
	Instituto Superior de Entre Douro e Vouga (IsVouga)
	Instituto Superior de Línguas e Administração (ISLA) de Santarém
	Instituto Superior de Línguas e Administração (ISLA) de Vila Nova de Gaia
	Instituto Superior de Línguas e Administração (ISLA) de Leiria
	Instituto Superior da Maia (ISMAI)
	Instituto Superior Politécnico de Gaya
	Instituto Superior Miguel Torga
	Instituto Superior de Tecnologias Avançadas de Lisboa (ISTEC)
	Instituto Superior de Serviço Social da Universidade Lusíada de Lisboa

Ministério do Trabalho e da Solidariedade Social/ Instituto do Emprego e Formação Profissional	Centro de Formação Profissional para a Qualidade (CEQUAL - Porto)
	Centro de Formação Profissional para a Qualidade (CEQUAL - Lisboa)
	Delegação Regional do Alentejo / Instituto do Emprego e Formação Profissional
	Gestão, Tecnologia e Inovação, SA (GTI)
	Lusoinfo – Sistemas de Informação, Lda. – Maia
	AMBIFORMED – Ambiente, Segurança, Saúde no Trabalho
	Alquimia da cor, Produções Digitais, Lda. – Porto
	Centro de Estudos Formação e Actividades Desportivas Lda. (CEFAD)
	Instituto de Soldadura e Qualidade (ISQ) – Porto

3.5 Sweden

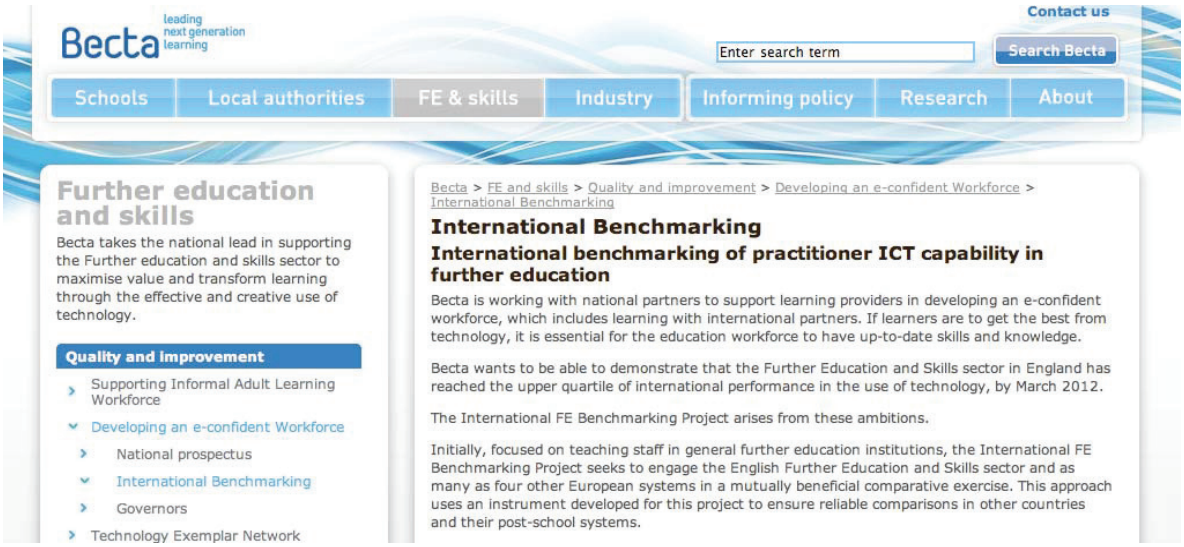
Baletakademin, Stockholm
Konsskolan i Stockholm
Fotoskolan i Stockholm
Modeskolan
Silversmidesutbildningen
Maskörskolan
Arbetslivs Uppdragsutbildningar
Arkitekturskolan Stockholm
Skrivarakademin
Intensivkurser i svenska. Språkavd Sthlm
Konstskolan Linnéa
Musikinstrumentakademin
Diagonalakademin
Gotlands Dansutbildningar
Gotlands Konstskola
Gotlands Tonsättarskola
Företagsuniversitetet AB
KY- Internationell marknadföring och försäljning
KY- Försäljning inom teknisk handel
KY-Redovisningsekonom
KY- Försälning inom detaljhendel
KY- Hälso- och sjukvårdssekreterare
KY- GIS: avancerade användare av geografiska system
KY- Behandlingsarbete med ungdomar
KY-Redovisningsekonom
Göteborgs komvuxverksamhet, SFI och KY
Angeredsateljén
Balettakademin i Göteborg
KV- Konstskola
Komvuxverksamhet i Varberg
Hantverkscentrum i Tibro

Lunds Konst- och Designskola
Fotoskolan i Skåne
Uppdragsutbildningar i Väst (Gbg)
Uppdragsutbildningar östra Skåne
Uppdragsutbildningar i Skövde
Balettakademin i Umeå
Kungstensgymnasiet
Folkuniversitetets Gymnasium i Linköping
Folkuniversitetets Gymnasium i Norrköping
Folkuniversitetets Gymnasium i Karlstad
Folkuniversitetets Gymnasium i Skövde
Folkuniversitetets Gymnasium i Trollhättan
Einar Hansengymansiet
Tegnérgymnasiet
Umeå Internationella Gymnasium
Braheskolan
Södra Stockholms Folkhögskola
YH-Kvalitets- och processteknik (läke- och livsmedel)

Appendix 4 – Conducting the survey

4.1 Becta IBP web page

Details of the project, including contacts and downloads can be found at www.becta.org.uk/feandskills/ibp



Downloads of the survey instrument format and the introduction to the benchmarking framework are available from the same page in the national languages of the partner countries

4.2 Documentation

Documentation describing the recommended sequence of activity to country co-coordinators:

1. **Translate the survey instrument and the introductory document** in to your preferred language (unless an English version is preferred) and submit to Sero Consulting for entry in to the online survey tool.
2. **Take account of the sampling methodology** (above)
3. **Identify the target institutions** – preferably a mix of urban and rural, large and small; you will need enough to provide the target number of teaching staff responses (e.g. for 500 respondents may require 20 institutions delivering an average of 35 responses, allowing for a drop out of 5 during the process); you might also identify a reserve list
4. **Email the invitation letter** to the Principal or a known contact – ideally with translated survey and introduction attached (see sample letter below)
5. **Follow up with a personal phone call** to establish the best contact person, to agree participation and to be sure they understand the commitment and the importance of a balanced sample
6. **Keep an eye on the weekly statistics**, which you will receive electronically from Sero Consulting, to see which institutions are completing and which need chasing; experience suggests that 90% will need chasing
7. **Follow up institutional contacts** by email and by phone to achieve the results
8. **Activate contingency plans in good time** – For example, mobilise the reserve institutions, ask the active participants to provide more, etc
9. **Write a letter of thanks** to each participating institutions as soon as survey ends, reminding them they should expect to get the report by the end of April
10. **Circulate the final report**, adding national observations in a covering note if appropriate

4.5.1 Sample invitation letter

A sample letter template was provided in English to assist the lead partners in the invitation process. The shaded words were changed for each country.

> **Developing an e-confident workforce – International VCET Benchmarking Project**
>
> Dear <Contact Name>
>
> I am writing to invite your institution to participate in an international benchmarking survey of practitioner ICT capability in further education, which <lead organisation> is undertaking with a European partnership led by Becta. Focused on teaching staff in further education, the project seeks to engage institutions from five European countries in a mutually beneficial comparative exercise.

The benchmark is designed to assess 12 indicators through practitioner responses to 50 statements. We are interested to see whether the 12 indicators differ, for example, between teachers of teenagers and over 50's or between Vocational Education and Training (VET) and community learning, as well as across national systems.

The 2010 benchmarking survey, which runs from 25 January to 24 February 2010, aims to collect data from up to 500 teaching staff in each country, amounting to over 2000 practitioner responses.

The survey consists of 12 simple positioning questions, followed by responses to 50 statements about the practitioner's use of ICT in teaching and learning. All 50 statements require a single 'tick' response on the 5-point scale of 'Strongly Agree' to 'Strongly Disagree' (the Likert Scale). There is just one optional free text response at the end, enabling participants to make any further observations. Individuals should allow around 12 minutes for the complete survey, which will conducted on-line, using SurveyMonkey™.

A PDF of the survey instrument is attached, together with a second PDF offering more background detail about the project. Both of these are also available on the project website http://www.becta.org.uk/feandskills/ibp.

We would like you [or an appropriate manager] to identify <35> members of the teaching staff to complete the survey. These should be a cross-section of teaching staff [e.g. of age, sex, subject area and ICT capability] – not just known technology enthusiasts. There will not be any follow-up interviews, so the time commitment should be only a few minutes for each person. Most important, the identity of individuals or organisations will not be disclosed in analysis or publication.

We hope that you will agree to your institution's participation. If you are happy to do this, we will ensure that you have access to the project report, which will be finalized in April 2010. Please confirm participation to <coordinator email / phone number> as soon as possible, together with the name and email address of your designated contact.

I will be available throughout the project to answer any questions.

With best wishes, etc

4.3 Notes on preliminary statistical analysis

[These analyses were undertaken by Dr Neil Conway, Senior Lecturer in the Department of Organisational Psychology at Birkbeck College, University of London, under the direction of David Jennings, a Chartered Occupational Psychologist]

Why do a preliminary statistical analysis?

The cornerstone concepts of this analysis are reliability and validity, which are defined in specific operational terms as follows:

- A **reliable** measure is one that measures something consistently
- A **valid** measure is one that can be shown to measure what it is supposed to measure and to be related to other constructs in expected ways (for example, a measure of job satisfaction is negatively related to employee turnover, and positively related to other indices of wellbeing).

In order to test the validity of our survey, we would need some independent measure of the respondents' effectiveness in harnessing technology in their teaching practice. Then we could check that someone who scored 'highly' on our survey also scored highly on that independent measure (and conversely) – if it did that would mean our survey was a valid ('accurate') predictor of real-world performance. If the benchmarking study were to be repeated, it would be interesting to explore potential independent measures to assess validity However, as we do not have one at this stage, we can't test validity of the survey. All we have to go on is the respondents' self-assessment of their effectiveness and efficiency in the Outcomes section of the survey – see below.

This data still gives us a basis to test whether the six themes of the survey are reliable – or whether some alternative configuration of the 50 Likert-scale questions would provide a better set of dimensions (in terms of more signal, less random 'noise'). Further details of the analysis are in the Technical Appendix.

Key findings from this analysis

Overall, the various statistical analyses we ran on the data provided good support for the model we hypothesised when devising the survey. Key findings were as follows.

- The five 'input'[19] factors – Me, My Influences, My Learners, My Curriculum, My Organisation – and one Outcomes factor were supported by the data. In some cases, the hypothesised sub-scales of these factors were also supported – see (3) below.
- Each of these factors was found to have strong reliabilities. In fact the reliability of the Outcomes factor, in particular, was close to being 'too' strong. Reliability increases as the intercorrelations between responses to individual questions in the scale increase. If these intercorrelations are very high, it suggests that respondents are effectively treating the questions as nearly identical ways of asking the same thing. In other words, some of the questions may be redundant in that omitting them would not change the patterns in the data[20].

[19] The first five of the themes [Me, My Learners, My Curriculum, My Organisation My Influences] are essentially **inputs** to the teaching and learning process; the sixth theme [My Outcomes] is effectively an **output** of the process. In the main report, all six themes are discussed individually, but are not differentiated in the text between inputs and outputs.

[20] Cases where the reliability verges on being too high may reflect that a number of the questions had responses strongly skewed towards high level of agreement with the set of items (i.e., the majority of respondents reported 5 on the 5-point scale). This was especially the case in the Outcome dimension where lots of respondents strongly agreed with the positive self-assessments of the impact of ICT on their effectiveness, efficiency and professionalism

- Three of the factors could be further divided into more fine-grained sub-scales, which also had sufficiently high reliabilities to be aggregated and reported independently. These were:
    a. the My Curriculum factor divides into Content and Assessment sub-scales, and
    b. the Outcomes factor divides into Work and Learners sub-scales;
    c. the Culture sub-scale of the My Organisation factor is reliable, but as the Infrastructure sub-scale is not, this factor is probably treated as one, rather than sub-divided.
- The input factors were all correlated with each other and with the output factors, and these correlations were significant at the 1% level (i.e. the chances of getting such high correlations by chance alone are less than 1 in a 100). This is consistent with our model, though this cannot be counted as positive 'proof' of the model as correlation does not necessarily imply causality.

Recommendations for future benchmarking exercises

We can keep using the same dimensions for the survey and model. There is also scope, if we considered it useful, to refine our model to include the subscales of My Curriculum, My Organisation and My Outcomes.

We could consider moving from a 5-point Likert scale to a 7-point scale. This should elicit greater variation in the responses, especially where they have been skewed towards 'strongly agree' in this survey – and thus offer more chance of differentiating between countries, genders, types of learners etc.

Given the high reliabilities, we could probably shorten the survey by deleting, say, 10-12 of the questions, without losing its ability to differentiate between 'high' and 'low' scorers. This is particularly the case in Section 8 of the questionnaire, where we could possibly lose half the questions without losing any differentiation. The advantage of this is that it could enable us either to make the questionnaire shorter – and thus improve response rates – or to substitute new questions to explore new lines of enquiry, while keeping the questionnaire the same length.

Finally, it would be a significant development if we were able to show that scores on the survey correlated with some objective measure of harnessing technology, which might be derived from the System Outcomes described in the UK strategy[21]. Such a measure would ideally be based on behavioural/performance indices, rather than self-report by teaching staff, and this is harder to do. To devise and collect data for such a measure consistently across several countries would be a major undertaking, conceptually and logistically. The complexity and cost would likely be an order of magnitude higher than that of this study.

[21] http://publications.becta.org.uk/display.cfm?resID=42124&page=1835

Statistical analyses performed

The framework we used to develop the survey hypothesises five 'input' themes, each of which has an independent causal impact on the sixth Outcomes theme. The diagram in section 1.3 [reproduced also in the Executive Summary] illustrates these relationships. We undertook two different kinds of Factor Analysis to test this model.

Since our model had no independent support and had undergone no prior testing, it remained an hypothesis, so we carried out an exploratory Factor Analysis of all questions. There was a risk in doing this, since – if the model were correct – then each of the five input themes would correlate with the Outcomes theme, and this correlation might obscure the existence of one or more themes. However, this analysis in fact supported the six hypothesised themes in the model.

To test the model in more detail, and avoid the risk of causal relationships affecting the themes, we did Factor Analyses *within* each of the six hypothesised themes to see if there were any sub-scales within them. Then we undertook tests of reliabilities, to see whether clusters of items from themes suggested from the Factor Analysis could be regarded as sufficiently highly inter-correlated to belong to the same scale.

Having tested the themes in our hypothesised model, and confirmed their reliabilities, the final test was to measure the correlations between themes and see whether these were consistent with the causal model we had hypothesised. This we did with a Regression Analysis , which enables us to understand how the typical value of our Outcomes theme changes in line with changes to one of the input factors (My Influences, My Curriculum, My Learners etc) while each of the other themes and the personal variables (such as country and gender) are held fixed. In other words, it filters out the impact of each of the input themes individually.

These analyses were performed on the full 'raw' data set.

4.4 Computation of category scores

Average Score is computed for 61 data items (cells) in each row (see Scorecards below for definition of each row):

- 2 super-indicators (Combined inputs, combined outputs)
- 8 indicators (6 input, 2 output) – see survey layout to see how the 51 statements map on to these
- The 51 statements – the base items in the survey

The aggregation and analysis used only the 2264 fully completed responses, as follows:

Responses	EN	SV	AT	DK	PT	Total
All	548	250	546	226	1018	2588
Partial	62	74	45	59	84	324
Completed	486	176	501	167	934	2264

The Average score is computed to 2 decimal places for each of these 61 data items on the basis of summing answers as follows:

1 strongly disagree
2 tend to disagree
3 neither agree nor disagree
4 tend to agree
5 strongly agree

The results are colour coded to enable easy visual recognition of patterns:

- Red – Lowest band
- Orange
- Yellow
- Green – Highest band

Scorecards

Scorecard A – Personal perspective

This grid is in **the 'Personal' worksheet** in the spreadsheet, grouping the responses according to the personal attributes of the staff (Gender, Age, and Mode of Employment).

It has 66 columns and 120 rows, covering all combinations of personal characteristics (Sex, Age, Mode of employment) by Country (5 countries plus the combined 'All' grouping).

As set out above, all Sex, Age and Mode categories are as per the survey questions other than 'Not FT' combines both 'Part Time' and 'Seasonal', based on the level of responses in the categories – see above.

Country	Sex	Age	Mode	No of Returns	2 columns for super-indicators - averages of inputs and of outputs	8 columns for the 6 input and 2 output indicators	51 columns for the questions
Austria	Male	Under 30	Full Time	Total	Ave score	Ave score	Ave score
Austria	Male	Under 30	Not FT				
Austria	Male	30 to 50	Full Time				
Austria	Male	30 to 50	Not FT				
Austria	Male	Over 50	Full Time				
Austria	Male	Over 50	Not FT				
Austria	Female	Under 30	Full Time				
Austria	Female	Under 30	Not FT				
Austria	Female	30 to 50	Full Time				
Austria	Female	30 to 50	Not FT				
Austria	Female	Over 50	Full Time				
Austria	Female	Over 50	Not FT				
Austria	Male	All	All				
Austria	Female	All	All				
Austria	All	Under 30	All				
Austria	All	30-50	All				
Austria	All	Over 50	All				
Austria	All	All	Full Time				
Austria	All	All	Non FT				
Austria	All	All	All				
Denmark	20 rows	As above					
England	20 rows						
Portugal	20 rows						
Sweden	20 rows						
All	20 rows						

Scorecard B – Audience perspective

This grid is in the 'Audience' worksheet in the spreadsheet, grouping the responses according to the attributes of the learners and subjects primarily taught by the staff (Subject, Learner Type, and Learner Age). It has 66 columns and 540 rows, covering all combinations of learner 'Audience' characteristics (Subject Group, Learner Type, Learner Age) by Country (5 countries plus the combined 'All' grouping).

As set out above, all the audience categories are as per the survey questions other than:

- Subject Group - where the 16 subject areas are aggregated into 5 Groups (including 'Other')
- Type – 'VET' combines both 'Vocational' and 'Community'
- Age – '30 plus' combines both '30-50' and 'Over 50'

The latter combinations are based on the level of responses in the categories – see above.

Country	Subject Group	Learner Type	Learner Age	No of Returns	2 columns for super-indicators - averages of inputs and of outputs	8 columns for the 6 input and 2 output indicators	51 columns for the questions
Austria	STEM	Academic	16 to 19	Total	Ave score	Ave score	Ave score
Austria	STEM	Academic	20 to 29				
Austria	STEM	Academic	30 plus				
Austria	STEM	Academic	Comb				
Austria	STEM	VET	16 to 19				
Austria	STEM	VET	20 to 29				
Austria	STEM	VET	30 plus				
Austria	STEM	VET	Comb				
Austria	STEM	Academic	All				
Austria	STEM	VET	All				
Austria	STEM	All	16 to 19				
Austria	STEM	All	20 to 29				
Austria	STEM	All	30 plus				
Austria	STEM	All	Comb				
Austria	STEM	All	All				
Austria	H&E	15 rows	As above				
Austria	C&B	15 rows					
Austria	LCAM	15 rows					
Austria	Other	15 rows					
Austria	All	15 rows					
Denmark	90 rows	As above					
England	90 rows						
Portugal	90 rows						
Sweden	90 rows						
All	90 rows						