Department for Education

Online and blended delivery in Further Education

A literature review into pedagogy, including digital forms of assessment

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Executive Summary

Background

In recent years, the use of technology in educational delivery – commonly referred to as EdTech - has become increasingly widespread, exemplified by the Department for Education's (DfE) publication in 2019 of a national EdTech strategy[1] for the first time. In addition, in the recent White Paper the Government committed to improving digital skills by enabling increased support for online and blended teaching.[2]

The Covid-19 pandemic, and in particular the closure of educational providers to most learners, has brought about a marked change in educational delivery such that online, remote and blended forms of education were widely used during lockdown. This has had a considerable impact on England's Further Education and Skills sector. Teachers in Further Education (FE) institutions have had to rapidly adapt their teaching methods to the new circumstances and deliver online content and lessons for their learners using tools such as Microsoft Teams, Google Classrooms, and educational software such as Canvas and Moodle.

It is currently unknown how long FE settings and educational delivery will be affected by the pandemic. It is expected, however, that EdTech will have an enhanced role going forward given the benefits it can have for both teachers and learners when utilised effectively. To ensure the success of online and blended education and so that learners continue to benefit from a good standard of teaching, teachers need to know how to teach online. They must also understand how to adapt traditional face-to-face pedagogic practices so that they are suitable for a new environment and mode of learning.

Attempts to develop over-arching frameworks for evaluating online and blended learning have not been notably successful. Chapter 3 briefly considers two of them, one of which focuses heavily on the teacher's role. The other framework offers more possibilities, in that it is more successful in encompassing the various aspects of online/blended learning and their interconnectedness. But there is no evidence about how helpful or otherwise it may have been in practice.

Review focus

The findings from this literature review will form part of an evidence-based view that:

- helps the DfE to understand how traditional pedagogic theory is impacted by, and how it responds to, online or blended delivery
- identifies effective pedagogic approaches and techniques that can be used by FE teachers in online or blended delivery

[1] DfE (2019). Realising the potential of technology in education: A strategy for education providers and the technology industry
[2] DfE (2021). Skills for Jobs: Lifelong Learning for Opportunity and Growth. CP 338

- defines good quality online and blended teaching.

The research questions focused on four key themes: online and blended learning pedagogies; quality and effectiveness of online and blended teaching and learning; assessment; and professional development and support for staff.

Conclusions

Online and blended pedagogy

- **All the evidence indicates that fundamental pedagogical principles (as exemplified, for example, in the Teachers' Standards and the Ofsted Inspection Framework) should apply with equal force to both face-to-face and online / blended learning.** The principles do not change when moving to an online environment, but there are some difficulties in ensuring that they are robustly applied. This is especially the case with two significant issues – teacher presence and interaction not only between teacher and learners, but also between learners. The Community of Inquiry (CoI) model, and to a lesser extent the Technological Pedagogical Content Knowledge (TPACK) model, have provided a framework for studies addressing these issues during the last 20 years.

- **There are a number of initiatives seeking to develop what are currently little utilised applications of digital educational technology**. Of these, mobile pedagogy and immersive (AR and VR) approaches appear to be potentially the most fruitful. The Designing and Evaluating Innovative Mobile Pedagogies Project (DEIMP), however, is still on a small scale and in its early stages; and there are issues about the expense involved with AR and VR technologies.

Quality and effectiveness of online and blended teaching and learning

- **The characteristics of high quality online pedagogy are not fundamentally different from those in more conventional forms of educational delivery**. In some cases, however, teachers have had to adapt quickly, and there is evidence that even experienced teachers sometimes lack confidence in their ability to teach remotely.

- **There are a number of studies that indicate that various factors such as age, gender, physical impairment and level of achievement impact upon learners' success with online learning**. There is sparse evidence, however, about how the design, planning and delivery of online and blended learning is being adjusted by course developers and teachers to take account of these differences.

- **Few researchers distinguish between the FE and HE sectors, conflating them together as "tertiary"**. Nevertheless, although it is necessary to exercise a degree of caution, the key pedagogical elements that distinguish high quality online

teaching and learning are likely to apply equally whether in a school, college or HE institution context.

Assessment

- **The move to online/ blended learning is seen as a major driver for online assessment**, **accelerated by the Covid-19 pandemic**. A number of commentators argue that technology could transform assessment in a number of fruitful ways. But, the evidence indicates that how teachers use information from assessments, and how learners act on feedback, are of more significance than whether the assessment and the feedback are in digital or some other form.

- **There is evidence of some innovation in the use of technology for formative assessment,** exploring, for example, the effectiveness of different forms of assessment feedback via digital mediums. There is evidence that both students and teachers welcome the additional strategies for providing informative feedback that technology can provide.

- There is a broad body of research on formative and summative assessment generally, but **there is a gap in the academic literature reviewed about online or digitally supported formative and summative assessment in an FE context.** Much of the grey literature focuses on the outcomes from small-scale, action-research projects undertaken in the sector, and brief overviews are disseminated. But there is a lack of robust FE specific research in this area.

- **The barriers to the adoption of high-stakes summative assessment online** are chiefly: organisational culture, infrastructure and readiness, and issues of security and authentication. Despite considering there to be many potential benefits to online assessment, the opportunity for malpractice is seen as a major concern for many stakeholders.

Professional development and support for staff

- **The literature suggests that the transition from face-to-face teaching to an online teaching experience involved far more for teachers than just putting elements of learning online.** It influences how teachers see their role, their professional identity, their beliefs and assumptions about teaching. Peer support, creating a community, sharing work and collaborating, enables learning and builds confidence. These wider considerations need to be reflected in the training and development provided.

- **There is a high-level of consensus within the literature on the key components of effective professional development for digitally enhanced learning practitioners.**

- **A large majority of the teachers surveyed by Jisc reported that they received good support from their organisations to develop basic IT skills (Jisc 2020b).** Fewer, however, felt they had received guidance about the specific digital skills needed for their job or reported having time to explore new digital tools and approaches.

- **The review found little evidence in the literature of training / CPD specifically focused on issues to do with online assessment**. There is some indication that where it exists it is provided by commercial organisations or awarding bodies.

Chapter 1: Introduction

1.1 Background

In recent years, the use of technology in educational delivery – commonly referred to as EdTech - has become increasingly widespread, exemplified by the Department for Education's (DfE) publication in 2019 of a national EdTech strategy[3] for the first time. The strategy identifies five key areas of opportunity where technology can drive a step change:

- Administration processes – reducing the burden of 'non-teaching' tasks
- Assessment processes – making assessment more effective and efficient
- Teaching practices – supporting access, inclusion, and improved educational outcomes for all
- Continuing professional development – supporting teachers, lecturers and education leaders so they can develop more flexibly
- Learning throughout life – supporting decisions about work or further study and helping those who are not in the formal education system gain new skills.

In addition, in the recent White Paper the Government committed to improving digital skills by enabling increased support for online and blended teaching.[4]

The Covid-19 pandemic, and in particular the closure of educational providers to most learners, has brought about a marked change in educational delivery such that online, remote and blended forms of education are now prevalent. This has had a considerable impact on England's Further Education and Skills sector. Teachers in Further Education (FE) institutions have had to rapidly adapt their teaching methods to the new circumstances and deliver online content and lessons for their learners using tools such as Microsoft Teams, Google Classrooms, and educational software such as Canvas and Moodle.

Although generally FE providers and teachers were able to move education online quickly and ensure that education and training could continue in the short-term, not a lot is known about the quality of different approaches to online education and teaching. In the summer of 2020, Ofsted (2020) undertook a small-scale qualitative review of online education to identify learners' experiences and evidence of what works. They found variability in the quality of online teaching ranging from engaging 'live' online lessons to teachers simply reading from slides. Moreover, surveys carried out by sector organisations such as the Association of Colleges (2020b) have indicated that a significant minority of FE staff did not feel confident or capable of delivering a high standard of online teaching.

[3] DfE (2019). Realising the potential of technology in education: A strategy for education providers and the technology industry
[4] DfE (2021). Skills for Jobs: Lifelong Learning for Opportunity and Growth. CP 338

It is currently unknown how long FE settings and educational delivery will be affected by the pandemic. It is expected, however, that EdTech will have an enhanced role going forward given the benefits it can have for both teachers and learners when utilised effectively. To ensure the success of online and blended education and so that learners continue to benefit from a good standard of teaching, teachers need to know how to teach online. They must also understand how to adapt traditional face-to-face pedagogic practices so that they are suitable for a new environment and mode of learning.

Attempts to develop over-arching frameworks for evaluating online and blended learning have not been notably successful. Chapter 3 briefly considers two of them, one of which focuses heavily on the teacher's role. The other framework offers more possibilities, in that it is more successful in encompassing the various aspects of online/blended learning and their interconnectedness. But there is no evidence about how helpful or otherwise it may have been in practice.

The findings from this literature review will form part of an evidence-based view that:

- helps the DfE to understand how traditional pedagogic theory is impacted by, and how it responds to, online or blended delivery
- identifies effective pedagogic approaches and techniques that can be used by FE teachers in online or blended delivery
- defines good quality online and blended teaching.

1.2 Methodology

1.2.1 Research questions

The review was designed to address the following questions:

Online / blended pedagogy

1. How does pedagogy work in online and blended FE environments?
2. Does online and blended FE delivery pedagogy differ to pedagogy in conventional FE delivery? If so, how does general pedagogical knowledge need to be adapted to effectively deliver learning online or in a blended format?
3. Are there any specific pedagogical theories or techniques that are more relevant than others in online and blended FE environments? If so, why?
4. Are there differences in online and blended FE delivery pedagogical theories and techniques between qualification levels, sector/subjects, and learner cohorts (e.g. 16-19 compared to adults)? If so, in what way and why?

Quality and effectiveness

5. What does effective and high quality online and blended FE delivery look like? What are the characteristics that make it effective and high quality? What does "good practice" look like?

6. Is there any evidence of what effective and high quality online and blended delivery looks like from the Higher Education (HE) sector, which can read across to the FE sector?

7. How do the characteristics of effective and high quality online and blended FE pedagogy map, if at all, onto the key expectations of teaching outlined in the Ofsted Education Inspection Framework?

Assessment

8. How does assessment work in online and blended FE environments?

9. What does effective assessment techniques in online and blended FE environments look like? How is "effective" defined in the context here?

Professional development and support

10. What pedagogical focused training and professional development opportunities, and other forms of support, exist for FE teachers/trainers/practitioners in online and blended delivery? Does the evidence suggest any gaps around online and blended pedagogical training and support?

11. What assessment focused training and professional development opportunities, and other forms of support, exist for FE teachers/practitioners in online and blended delivery? Does the evidence suggest any gaps around online and blended assessment focused training and support?

In order to manage the literature search and to enable more focused reporting, the research questions were collated into four key themes: online and blended learning pedagogies; quality and effectiveness of online and blended teaching and learning; assessment; and professional development and support for staff.

Table 1: Review questions grouped by theme

Theme	Summary of research questions
Online / blended pedagogy	How does it work? Comparison with conventional delivery Relative relevance of specific theories / techniques Differences related to context
Quality / effectiveness	Characteristics of good pedagogical practice Evidence of high-quality crossover HE to FE? Link to Ofsted expectations?
Assessment	How does it work? Characteristics of good assessment practice
Professional development / support	Availability / gaps in pedagogical development / support Availability / gaps in assessment development / support

1.2.2 Search terms and keywords

The search terms, keywords and search parameters for the review were developed in consultation with DfE.

Institution / sector

General further education college; Specialist college; Sixth form college; Training provider; post 16 education; 16-19 education; FE provider; continuing education; vocational education; adult and community learning; offender learning; higher education; HE; University Technical College; UTC; SEND.

Digitally based learning

Educational technology; technology in education; digital technology; information and communications technology; ICT; computer technology; word processing; computer literacy; online education; remote learning; blended learning; blended education.

Online / blended pedagogy

Pedagogy; pedagogical; computer assisted instruction; problem solving; open-ended learning; collaborative learning; teaching styles; personalised learning; interactive learning; experiential learning; flipped learning; remote delivery; remote teaching; distance learning; webinars; tele-conferencing; video conferencing; face-to-face

classroom teaching; Covid-19 pandemic; coronavirus; practical activities; approaches to teaching; approaches to e-teaching; virtual classrooms; HyFlex; hybrid flexible; Digi-Pals; social learning theory; blended delivery; blended teaching; online lessons; curriculum sequencing; providing feedback.

Quality /effectiveness

Effectiveness; effective teaching; outstanding providers; evaluate; evaluation; accountability; quality of provision; high expectations; constructive feedback; improvement; quality; high quality; good; success; best practice; practice; theories; techniques; approach; approaches; knowledge; expertise, high calibre; learner outcomes; learner progression; learner engagement.

Assessment

Assess; assessment; skills; achievement; outcomes; qualifications; formative assessment; summative assessment; supporting learning; measuring progression; examination; exam; practical assessment; practical techniques; approach; approaches; practice; methods; expertise; success; diagnostic.

Professional development / support

Performance management; self-evaluation; teacher education; continuing / professional development; CPD; teacher training; teacher preparation; training; support; development; opportunities; teacher confidence.

1.2.3 Search parameters

Population:	Post 16 students in further education. Where relevant, studies focused on higher education or upper secondary education were also included.
Publication date	The primary focus was on material published between 2015 and 2020 as it was acknowledged that studies on technology based approaches pre-2015 are less likely to be relevant to current online learning approaches. Studies earlier than 2015 were, however, included if, for example: (i) they addressed a relevant issue not considered in later literature; or (ii) they were included in a review published post-2015.
Relevance	Relevance to one or more of the four key themes. Judgements were made primarily on the basis of reading abstracts or summaries.
Geographical scope	UK and international.
Language	Literature published in English.

1.2.4 Search sources

Bibliographic databases: Australian Education Index (AEI), British Education Index (BEI) Education Resources Information Center (ERIC), Google Scholar, Semantic Scholar, ResearchGate

Peer-reviewed journals: Journal of Further and Higher Education, Research in Learning Technology

Websites of key organisations: Department for Education, Ofsted, Association of Colleges, Association for learning technology, Jisc, Education Endowment Foundation

1.2.5 Review stages

The review was conducted in three stages.

Stage 1

Exploratory and evidence scoping of the available literature around the pedagogy of online and blended learning and digital forms of assessment in FE delivery.

The original search identified 148 items. These items were given a first screening in order to:

- exclude any duplicates
- ensure that they met the search parameters
- assess on the basis of abstracts / summaries whether they should be included in the next phase of the screening process.

In addition, based on a rapid reading of the full text, items were given an overall rating (low, medium or high) of their quality and potential value to the review. The assessment criteria were:

1. in the case of academic papers whether they had been peer reviewed
2. how far the findings / conclusions were supported by an appropriate research methodology (e.g. in the case of quantitative studies, the means by which data was collected and the nature of the population involved)
3. where conclusions were based on the reported views of expert witnesses, factors such as the number and range of experience of the individuals involved
4. their relevance to one or more of the key themes
5. the extent to which researchers appeared to be familiar with and took account of other work in the same field.

- **Low rating:** items met criteria 2 and 4

- **Medium rating:** in addition, depending on the nature of the material, met another relevant criterion (e.g. papers in academic journals met criterion 1)

- **High rating:** item met all relevant criteria

As a result of the first screening the low rated items were removed and the number of items was reduced to 112.

Stage 2

Review point to assess the quantity, relevance and quality of the evidence that had been gathered, and to determine how to proceed.

There has been a wide response globally to the Covid-19 pandemic and its impact on students and colleges. This is reflected in the extensive range of articles, reports, surveys and guidance material published in the last two years which was larger than had originally been envisaged. Even after the initial screening the number of items, notably those considering issues of online pedagogy and effectiveness, remained high. In those two areas there was also a high degree of commonality on many of the issues.

As a result, following discussion with DfE, it was considered viable in the case of online pedagogy and effectiveness to concentrate primarily on material published in the past four years (2017-2020). The main exceptions being items: (i) referenced in surveys and reviews which were prior to 2017; (ii) relevant to aspects of the research questions where there is relatively little recent evidence (e.g. in relation to online and blended learning in adult education). The two other areas, online assessment and teacher professional development and support, have not received the same amount of specific attention from researchers. In these areas, therefore, the timeframe was extended to 2015.

Initially, therefore, Stage 3 focused on 48 of the most relevant items.

Stage 3

In-depth review, including published literature, grey literature and other available evidence and analysis.

The Stage 3 review included the 48 agreed items, but as it progressed the list of search terms was updated and additional academic papers, reports, grey literature and other available evidence were included. These were analysed and used to respond to the 11 review questions and their sub-questions. Consequently, the review includes 85 items.

Much of the research cited in this review was carried out at university level within higher education, or in secondary education. Nevertheless, the majority of the findings contain key elements that could be relevant in the context of the FE sector and have been included. In addition to work within the UK, the review also considered studies conducted elsewhere – notably USA, Canada and Australia.

Chapter 2: Online and blended learning pedagogy

Summary

This chapter presents a brief overview of the current position on the use of online and blended learning in FE colleges. It identifies some significant distinctions between three of the terms used to describe educational digital technology; emergency remote teaching (ERT), blended and flipped learning. Of the frameworks for considering how online learning environments might best be designed to optimise learning, two in particular – the Community of Inquiry (CoI) and the Technological Pedagogical Content Knowledge (TPACK) models – have been highly influential over the past two years. Their main elements are described. The chapter also presents a summary of the main differences between conventional and online / blended learning pedagogy. There were a few small-scale studies around attempts to exploit the pedagogical potential of digital technology more radically. Of these the use of immersive technologies such as augmented reality (AR) and virtual reality (VR) seem currently to have the most to offer.

A number of key points are highlighted in this chapter, notably:

- the necessity of not departing from the principles of accepted pedagogical practice
- the importance of an effective teacher presence and of maintaining interaction between students in online learning
- that to improve learning, technology must be introduced in a way that is informed by effective pedagogy.

2.1 Current use of digital technology in FE

The Further Education Learning Technology Action Group (FELTAG) report (2013) recommended that all courses should include online learning, and that teachers should have continuing professional development (CPD) to enable them to understand and optimise the use of learning technology. “Learning technology, when astutely used by teachers and providers, can improve FE learners' chances and successfully influence what students do to learn, so that every student can reach their learning potential.” In addition:

> “The work of FELTAG addresses how digital technology can personalise learning, enabling people to take greater control of how they learn, when they learn, and how and when they are taught and assessed. Learning technology has the potential to support more peer-to-peer learning, emulating how adults learn once they are in work, and it can reach adults who are habitually unlikely to walk into

> a college or other building to learn, but for whom the digital domain provides enticing hooks." *(FELTAG, 2013, p7)*

Analysis of online training for teachers prior to the Covid-19 pandemic, however, indicated that the training was fragmented and met the needs of those with low-medium digital skills only to a limited extent (Laurillard, et al, 2016). Developing online provision was not a priority for most FE providers (Zaidi, 2018; SAGE, 2020).

Following the onset of the Covid-19 pandemic, of the colleges responding to the Summer 2020 survey conducted by the Association of Colleges (2020) (n=109) many reported that all or most of their under-19 students were working remotely during that term.[5] More than half of planned learning hours were being delivered online. Colleges were using digital technology for teaching and learning in a variety of ways, of which the most common (93 per cent) were timetabled live video lessons. Other provision included:

- opportunities to book short sessions with tutors for personalised support (86 per cent)
- weekly set activities and assessments for students to complete in their own time (73 per cent)
- opportunities to work collaboratively with peers online (69 per cent)
- timetabled pre-recorded lessons (68 per cent)
- reduced timetable and shorter lessons to support independent study (66 per cent)
- activities and assessments set weekly for students to complete via a structured timetable (57 per cent).

The Jisc teaching staff digital experience insights survey (2020b)[6] similarly looked for any early signs of impact and change as a result of the onset of the Covid-19 pandemic. The survey was conducted between October 2019 and July 2020, and the analysis was done by comparing the responses gathered from teaching staff before and on/or after lockdown on 23 March 2020.The responses submitted after that date were looked at to identify any early signs of change, however small. The analysis found a number of statistically significant differences in responses when comparing those from before and on/or after 23 March, as well as some positive shifts in usage and attitudes.

> "The use of digital teaching practices on a weekly or more frequent basis increased during lockdown and there was a natural pronounced rise in the number of teaching staff who worked online with learners and gave digital feedback … and it was encouraging to see

[5] Of the 109 institutions taking part in the survey: 91 were general FE colleges; 6 were sixth form colleges; and 12 were specialist colleges. This represents 45% of the total number of colleges in England. The survey was a follow up to one published in May 2020 and was issued on 26 June 2020.
[6] The survey involved 2,685 teaching staff in 26 FE and sixth form colleges from across the UK.

> experimentation with technologies of particular value to practical subjects." (*Jisc, 2020b*)

More than half of the colleges considered that they had access to high quality and engaging digital resources for, amongst other courses: mathematics, computing and IT, business, and health and social care. Amongst the curriculum areas where there were felt to be deficiencies were: animal care, some A-level subjects (not specified), construction, and hospitality and catering.

2.2 Defining digital teaching and learning

A wide variety of terms are used to describe digital learning experiences, even when they are describing the same or very similar experiences. Indeed, the terminology may often differ within the same institution or department (Jisc 2020a). Not all variations in the terminology used to identify digital learning approaches are necessarily significant in determining institutional policy or practical application. There are three terms, however, which appear in the literature – particularly in the more recent literature – which it is helpful to distinguish when considering online pedagogy. The terms are: emergency remote teaching (ERT), blended learning, and flipped learning.

2.2.1 Emergency remote teaching (ERT)

One distinction of particular significance currently is that between what is commonly referred to as "emergency remote teaching" (ERT) or "emergency online teaching" (EOT)[7] and remote or other forms of online learning. ERT is used to describe the approaches to remote teaching and learning put in place during the Covid-19 pandemic as schools and colleges closed. It is a "temporary shift of instructional delivery due to crisis circumstances"; a rapid approach that is unable to make full use of quality online learning design approaches (Hodges et al., 2020; Cowden et al, 2020). There are likely to be differences, for example in the variety of online learning approaches teachers employ, between ERT and more established online pedagogy (Bonfield, et al, 2020).

Given the potential differences, Hodges et al (2020) argue that ERT should not be evaluated on the same basis as online teaching and learning approaches that have been planned and put in place over a period of time. Evaluating ERT will, they argue, require broader questions - especially during its initial implementation. Evaluation should be more focused on the context, input, and process elements than on the product (learning).

2.2.2 Blended learning

What constitutes "blended learning" (and similarly with "blended pedagogy") is much debated. Essentially, however, blended learning provides a combination of face-to-face learning and digital activities and content that facilitate any time/any place learning. In its strategic framework, the Welsh Government sees the blended pedagogic model – based on synchronous and asynchronous[8] attendance and enabling peer-to-peer working – as

[7] In this report the acronym ERT is used to cover both terms.
[8] Synchronous online learning is where a group of participants is engaged in learning at the same time (i.e. real time); with asynchronous learning there is no real-time interaction with other people.

being the way forward both during the Covid-19 pandemic and beyond. The framework identifies 12 characteristics of a blended learning delivery model. Amongst them are (Welsh Government, 2020):

- Learning is planned to take account of the different modes of delivery to create coherent programmes with clear aims, objectives and assessment points
- Learners are encouraged and supported to develop independent study and research skills, information literacy, motivation and resilience
- Digital and face-to-face components are carefully planned to be integrated and complementary, and each enhances and enriches the other
- Face-to-face time is prioritised for the delivery of practical activities that cannot be undertaken online, for peer collaboration, and to provide “scaffolding” for remote learning, including formative assessment, feedback, redirection and guidance
- Staff and learners understand what is expected of them, including how many hours of face-to-face, remote and independent learning are required, and any flexibilities around attendance and when they learn
- Digital inequalities and the barriers for vulnerable learners are considered in the planning and delivery of learning
- Activities are designed to help learners and staff manage “screen fatigue”, including short, focused sessions, time for regular breaks and flexible timetabling.

The strategic framework does not prescribe what the balance of remote and face-to-face learning activities should be. That, it maintains, should be determined by learning providers *“*based on their knowledge of learners’ needs and abilities; their ability to access digital learning and support; and the practicalities of delivering different courses and qualifications” (Welsh Government, 2020).

2.2.3 Flipped learning

Flipped learning is most often presented as a form of blended learning, although it can be adapted to an entirely online environment. It has been introduced in a wide range of settings in recent years, particularly in secondary schools and higher education.
The pedagogical approach is one in which students are introduced to learning material, usually through online resources, prior to face-to-face activities. The resources might include watching video explanations of key concepts or techniques, completing problems or assessment activities. Rather than lecturing for example, classroom time will then be used: for discussion and filling in gaps in knowledge; to target support at students with particular difficulties; or for small group activities to support collaborative learning.

In their definition, the Quality Assurance Agency (QAA) (2020) refers to flipped learning as a pedagogical approach which provides detailed instruction to individual students working outside a physical space. It places the onus on the students to use digital

resources to gain an understanding of content, concepts or theories related to learning outcomes. The “flip” back to the more didactic atmosphere of the classroom allows for a more flexible approach to articulating and discussing what has been learned.

Despite its popularity, however, and a range of theories about why the approach might be beneficial, there have been very few high-quality studies of the impact of flipped learning programmes on student outcomes (Stringer et al, 2019), and some commentators have expressed reservations (Lo and Hew, 2017). The main concern is that flipped approaches risk leaving struggling students to their own devices at the initial stages. While flipping may benefit more proficient students it may be exclusionary to low-engaged, peripheral[9] students. From his work with General Certificate of Secondary Education (GCSE) re-sit students in an FE college, Scott (2016) suggested that “flipped learning creates an inordinate expectation on external motivation, as students may only consider study to belong within an institutional environment”.

2.3 Fundamental pedagogical principles

Whatever the mode of delivery, there is widespread agreement on the requirement not to stray from the principles of accepted pedagogical practice (McAleavy and Gorgen, 2020; Sun and Chen 2016; Stringer et al, 2019; Cowden et al, 2020; Education Endowment Foundation, 2020). The best practice in the integration of technology and education is where pedagogy is at the forefront. (World Bank, 2020).

The underlying pedagogy of effective teaching and learning programmes does not change in different settings. At the heart of any pedagogical intervention should be the learner (Bonfield et al, 2020). This, and other long-established principles are viewed as essential to online or blended learning, as they are in face-to-face classroom teaching. Cowden et al (2020) identified three further key themes which research suggested underpinned all good pedagogical practice regardless of mode of delivery or context.

There is a considerable body of research and literature on what makes for effective pedagogy (McAleavy and Gorgen, 2020). Its chief attributes are identified, for example, in the Teachers’ Standards for England[10]. They are teaching which is: carefully planned, clearly structured and challenging; based on a secure knowledge of the subject matter and the curriculum; responsive to the strengths and needs of all learners; informed by the constructive use of assessment data. The role of technology, whether in the classroom, in online courses or as part of a blended learning approach, should be in assisting the delivery of these principles.

2.4 Principles for an online / blended learning pedagogy

2.4.1 What else is required?

Embedding fundamental principles and understanding, however, is considered in much of the literature as only one requirement in determining what online or blended learning

[9] Scott (2016) and others use the term “peripheral” to describe students who do not participate, are hard-to-reach and make little progress.
[10] https://www.gov.uk/government/collections/teachers-standards

pedagogy should look like (Mishra and Koehler, 2006; McAleavy and Gorgen, 2020; Roddy et al, 2017; Welsh Government, 2020; World Bank, 2020; Reyes-Fournier et al, 2020). It is also important to recognise the additional competences needed for teaching in an online or blended learning setting. The use of technology to support learning requires pedagogic thinking that moves beyond merely transferring face-to-face activities to an online environment. “Teaching exclusively online requires a different skill set than teaching face-to-face” and even experienced teachers can struggle when “operating in a wholly online environment” (World Bank, 2020). Staff need support to explore and make the most of hybrid blends of synchronous, asynchronous, face-to-face and online approaches and the security of operating in a culture that encourages innovation (Jisc, 2020c). In particular:

- The physical distance between teacher and learner is often problematic for both. Dealing with it successfully requires re-thinking and amending planning, teaching and assessment practices.

- “Just like in the regular classroom, good learning using technology requires teacher presence; not just for social interaction but to guide and facilitate learning” (Hodges et al., 2020). Online teaching should not, however, try to mimic the entirely synchronous teacher-student engagement of the conventional school. There is no necessity for teacher or student to be constantly in contact on a screen over the period of the working day. Learning involves an appropriate balance of teacher-directed, group and individual work that includes both synchronous and asynchronous activity (Cowden et al, 2020).

- Moves to more digital approaches require that teachers develop and retain the technical competencies needed to work successfully with a changing variety of systems, software and online tools. “Without adequate technological skills, teachers risk being unable to resolve technology-related problems during live class, which may impact student access to learning materials” (Roddy et al, 2017).

2.4.2 An e-pedagogical theory

There are advocates of a more decisive approach – of the need for a distinctive online / blended learning pedagogy. Some researchers would welcome such a pedagogy, but fear that it will prove too elusive, not least because the number of key contextual factors that arise defy generalisability (Steele et al, 2019). Others, rejecting attempts to attach new technology to old pedagogy, have put forward possible alternatives (Reyes-Fournier, et al, 2020) (See also section 4.1.2). In the context of this review, the most urgent call is the paper by Serdyukov (2015). This asks: “Does Online Education Need a Special Pedagogy?”

Writing in the context of American higher education, Serdyukov’s argument is that both the online education offered to learners and the professional development available to teachers are deficient in three particular ways. Firstly, they are led not by a comprehensive pedagogical theory but by technology and technological developments. Secondly, they are affected by what Serdyukov calls the “convenience factor” embedded in online education, which has an adverse impact on the ability and willingness of

students to learn and teachers to teach. And, thirdly, there is a contradiction between online learning, which is by its nature independent learning, and effective learning which requires interaction and communication between teacher and peers. It is this latter, he suggests, that is the weakest aspect of online learning. Communication is the main instrument of learning, but it is the shortcoming of online learning (Serdyukov, 2020). What is needed, therefore, is an alternative theory, an e-pedagogy.

Based on an analysis of various pedagogies, what Serdyukov offers is an ambitious 10-part model for the development of an e-pedagogy. (Serdyukov, 2015). Amongst its major characteristics, e-pedagogy is never static. As conceived by Serdyukov it is constantly evolving and undergoing modification. But at its heart is that active communication, collaboration and interaction among learners and between learners and their teachers is not only desirable but necessary for successful learning (Serdyukov and Serdyukov, 2015).

2.5 Models of online pedagogy

The kinds of concerns raised by Serdyukov, and others, are addressed by two models of online pedagogy. Both have been especially influential during the past 20 years and continue to be reflected in both the academic and the guidance literature (see, for example, the USA's National standards for quality online teaching, 2019). They are (i) the Community of Inquiry (CoI) model developed largely by researchers in higher education in Canada; and (ii) the Technological Pedagogical Content Knowledge (TPACK) model developed in the USA. Although both models were developed in HE, they are not – and were not intended to be – exclusive to the HE sector.

2.5.1 Creating a Community of Inquiry (CoI)

The CoI model is one of the most widely used frameworks for building communities online. In a series of papers (for example: Garrison et al, 2000; Garrison and Cleveland-Innes, 2005; Garrison and Arbaugh, 2007) Garrison and his colleagues sought to develop a theoretical framework for considering how online learning environments might best be designed to optimise learning. Their model of a CoI considers online learning as occurring through the interaction of three core elements: cognitive presence, social presence, and teaching presence, each of which has categories and indicators (Table 2). In successive papers the authors made some minor amendments to the categories and indicators, but the model has remained essentially the same.

Table 2: Community of Inquiry (CoI): elements, categories and indicators

Element	Categories	Indicators (examples)
Cognitive presence	Triggering events Exploration Integration Resolution	Sense of puzzlement Information exchange Connecting ideas Apply new ideas
Social presence	Emotional expression Open communication Group cohesion	Emotions Risk-free expression Encouraging collaboration
Teaching presence	Instructional management Building understanding Direct instruction	Defining and initiating discussion topics Sharing personal meaning Focusing discussion

Source: Garrison et al, 2000

Cognitive presence

Cognitive presence is described as 'the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse' (Garrison and Arbaugh, 2007, p 161). It relates to how far students personally engage with their learning in ways that enable them to gain new knowledge and understanding while working remotely.

The Practical Inquiry Model (PIM) created by Garrison et al. (2000) is an example. It includes four phases:

1. A triggering event, where a problem is identified for further inquiry
2. Exploration, where an individual explores the issue
3. Integration, where learners concept meaning from ideas formed in the exploration phase
4. Resolution, where learners can apply the new skills and knowledge learned from the previous phases into real-world application(s) (Garrison et al., 2000).

Social presence

Garrison and his colleagues maintain that the social context, interaction between teacher and student, and student and student, is an inherent part of the learning process. But it is here, not least because of physical distancing and the absence of elements that can be taken for granted in face-to-face situations, that remote education may fall short (see also 2.4.2). Social interaction, therefore, needs to be intentionally built into the design of remote teaching and learning approaches. Good remote learning needs to be understood

as a social phenomenon and not an exercise in supported self-study (McAleavy and Gorgen, 2020).

Fiock (2020), for example, suggests activities such as:

- Encourage students to share experiences and beliefs in online discussion
- Consider including real time communications using applications such as chat, collaborative whiteboards, interactive video, text, or virtual messaging
- Consider incorporating Web 2.0 applications in course activities, especially social software such as blogs and wikis
- Explicitly explain to students the importance of student-to-student interaction so that they can view classmates' perspectives as valuable.

Teaching presence

Ultimately, however, appropriate cognitive and social presence and the establishment of a critical CoI is dependent upon the presence of a teacher (Garrison et al, 2000). "Interactions by themselves are not sufficient to ensure effective online learning … [they] need to have clearly defined parameters and be focused in a specific direction, hence the need for teaching presence" (Garrison and Cleveland-Innes, 2005).

The essence of "presence" is not one-dimensional in that the teacher merely follows a set of prescribed actions that demonstrate availability and supportiveness in the online course. Presence is also a mindset for extending activity between student, teacher and content beyond just being there. The presence mindset includes creating an intellectual climate which is shared by the teacher and students in the online course. According to the model, setting the climate is the overlap of social presence and teaching presence, and some elements of both (Parker and Herrington,2015).

Many of the guides for online education describe the importance of on-going and meaningful teacher presence and support for students. As online learning can include both synchronous and asynchronous activities, it is important for students to know when and how to access support from their teacher. This may involve:

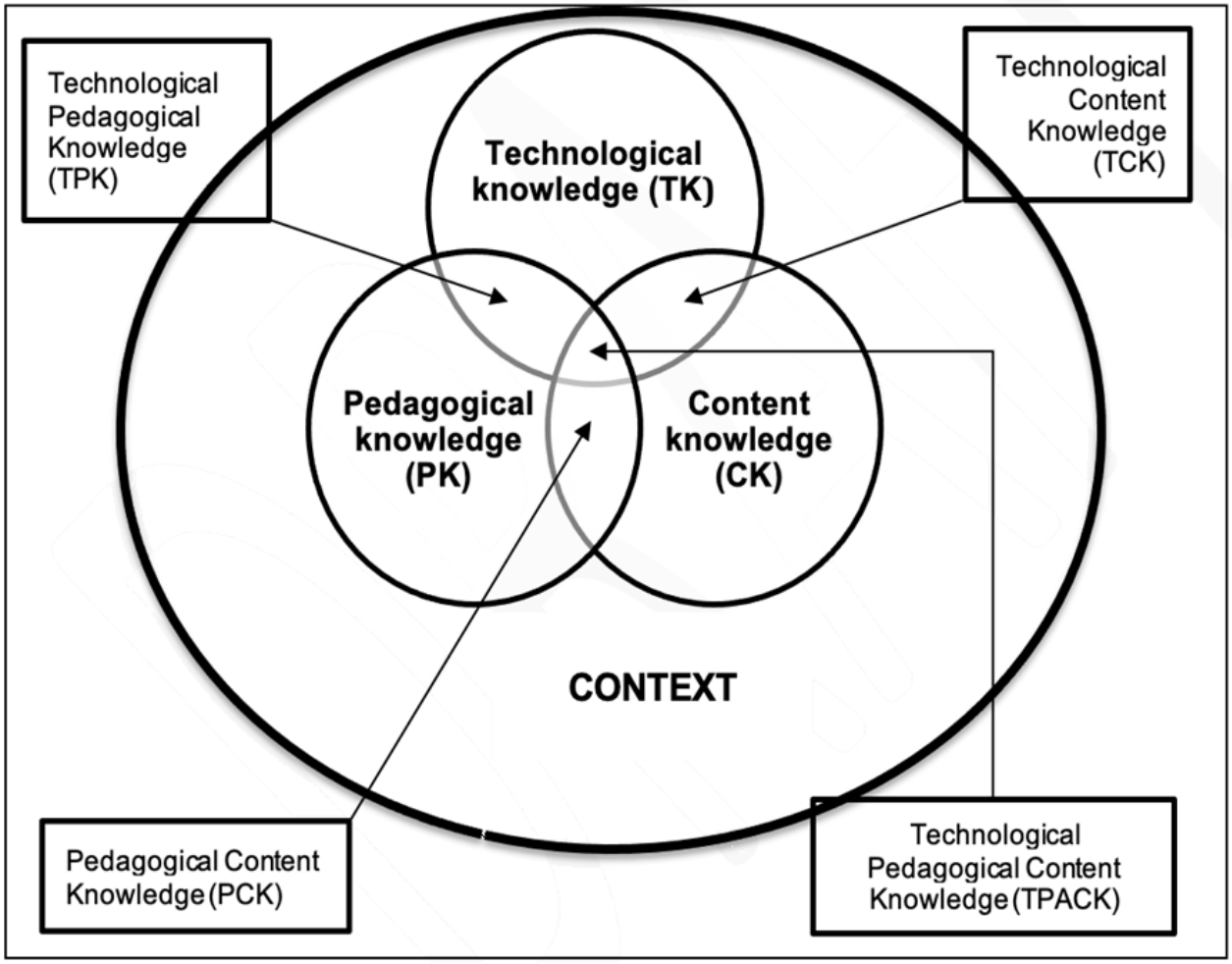
- setting expectations around when the teacher is available and how/why they can be contacted
- scheduling 'office hours' and regular check-ins with students, either online or via phone
- posting to online discussion boards (questions for students to respond to etc.)
- posting update videos or lectures
- using frequent formative assessments to stay up to date with student progress.

(Adapted from guidelines for teachers, California Department of Education, 2020)

2.5.2 Technological Pedagogical Content Knowledge (TPACK)

A second theoretical framework which, similarly, has had considerable influence is the Technological Pedagogical Content Knowledge (TPACK) model developed by Mishra and Koehler (2006) (Figure 1). This extended the earlier work by Shulman (1986) on what he termed pedagogical content knowledge (PCK).

Figure 1: TPACK model



Source: adapted from Mishra & Koehler, 2006, p 1025)

The TPACK model was designed to counter the view that technology should be seen as a separate set of easily acquired knowledge and skills whose relationship with the tried and tested basis of teaching (content and pedagogy) was non-existent. Rather, Mishra and Koehler maintain, there are important relationships between content, pedagogy and technology that are complex and nuanced. Further, technologies commonly come with their own imperatives that constrain both content and pedagogical decisions. It is, therefore, “inappropriate to see knowledge of technology as being isolated from knowledge of pedagogy and content” (Mishra and Koehler, 2006, p 1025).

In addition to teachers with strong subject specific knowledge and a solid understanding of effective pedagogy and different methods of teaching and learning, Mishra and Koehler (2006, p 1029) claim that the basis of good teaching with technology requires:

- pedagogical techniques that use technologies in constructive ways to teach content
- knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face
- knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones.

2.6 Conventional and online / blended learning pedagogy

In their guidance, QAA (2020) place learners' possible digital engagement and experience on a spectrum consisting of five categories: passive, supportive, augmented, interactive and immersive. Whilst acknowledging its limitations, the classification is an attempt to depict the types of engagement that learners can expect in moving from an essentially face-to-face to an essentially remote mode of learning. Comparing the first category (passive digital engagement/experience) with the final category (immersive digital engagement/experience) offers a helpful indication of the potential differences between conventional and online pedagogy (Table 3).

Table 3: Comparison of general FE pedagogy and online / blended learning pedagogy

	Characteristics of general FE pedagogy Passive digital engagement/experience	Characteristics of online / blended learning FE pedagogy Immersive digital engagement/experience
Programme design	Learning and teaching activities are designed to be delivered and engaged with onsite at the provider, emphasising the physical, in-person aspects of learning. Teaching and learning activities may make use of digital presentation tools. Assessments are designed to be undertaken and submitted in an analogue format, although some digital submission of assessed work may be permitted.	Learning and teaching activities are designed to be engaged with digitally, emphasising the personal experience in learning. Teaching and learning activities are only offered digitally with students expected to access digital resources to supplement these activities. Assessments are designed to be undertaken, submitted and marked digitally.
Resources offered to students	Little or no digital teaching or learning focused resource will be offered to students, with most resources provided in analogue format, onsite. Some programme information, such as handbooks or regulations may be accessible digitally.	Little or no onsite teaching or learning focused resource offered to students, with most resources provided digitally. Some analogue programme information, such as handbooks or regulations may be accessible onsite.
Teaching and learning approach	Onsite, physical engagement. There will be a focus on lectures and tutorials delivered onsite possibly involving skills instruction, or other lab/workshop/studio/performance space sessions.	Digital engagement. There will be a focus on lectures and tutorials delivered digitally, possibly involving digital skills instruction (overseen by experts remote from the provider), or other lab/workshop/studio/performance space sessions, conducted via video conference.
Technology used to facilitate modes of delivery	Usually limited to a provider's website, digital presentation tools (such as PowerPoint) and readily available software for communication (for example, Zoom or Teams). A virtual learning environment may be provided but will primarily be used as a repository for programme documentation, allowing students to access this if they choose to.	It is likely that a fully integrated use of a virtual learning environment will form students' only point of engagement with teaching and learning activities and the rest of their cohort. Specialist software and platforms will be provided to students to enable them to further engage with their learning.

Provider support offered to students	Primarily, support is offered to students onsite. Students may be able to access some support digitally via email, phone or videoconference.	Support is likely to be offered to students digitally through the virtual learning environment, email, phone, videoconference or chat. Students may be able to request some onsite support but this may not be delivered by staff or at the site of the provider.
Personal-isation	Limited opportunity to personalise engagement with the learning and teaching. All students will be provided with the same resources, and teaching is designed to be experienced by a cohort synchronously.	The entire learning experience is designed to be personalised by the student. Students will determine how they engage with every aspect of teaching and learning to meet their expectations. While all digital resources will be available to students, not all students will engage with those resources in the same way. Teaching is designed to be experienced by a cohort asynchronously with students learning at their own pace.

Source: Adapted from QAA (2020)

2.7 Specific pedagogical approaches and digital learning environments

There are studies, albeit mainly small scale and limited, which raise interesting possibilities about the relationship between aspects of pedagogical theory and the use of digital technology in an educational setting.

'Smart learning' and smart mobile pedagogy[11]

In a series of papers as part of the Designing and Evaluating Innovative Mobile Pedagogies Project (DEIMP), Burden and his colleagues (Burden et al, 2019a, 2019b, 2019c; Kearney et al, 2018) argue that e-Learning as developed in the 1990s across all education sectors was highly "tethered" and static in nature. Consequently, it has tended to resemble traditional, formal learning in its structures, practices and underlying pedagogical approaches. Although e-Learning has supplemented and extended the reach of traditional learning making it available at times and in spaces that were previously inaccessible for learners, the fundamental nature of learning itself has not altered. The emergence and application of mobile technologies, on the other hand, has introduced a possible paradigm shift in approaches to learning.

In practice, however, Burden and his colleagues detect that the predicted benefits of this shift to m-learning have not been fully realised. What is needed for this to happen, they argue, is a move towards "smart" learning, allied to an appropriate pedagogy and supported by smart mobile technology. Smart learning is characterised as learning that "emphasises the autonomy and independence of the learner in an environment that is responsive and adaptive to their individual learning needs."

The characteristics of smart learning are not new. Many of them - such as collaboration, personalisation and learner centeredness - have been actively promoted by some educators for many years in order to make learning more engaging, purposeful and meaningful. However, what is new, Kearney et al (2018) claim, is that "the conditions and technologies are now aligning in ways that make these learning approaches more feasible and achievable than was previously the case."

Learners as teachers

One of the recommendations of the Further Education Learning Technology Action Group (FELTAG) (2013) was that "Learners must be empowered to fully exploit their own understanding of, and familiarity with digital technology for their own learning". They went on to note that their research and conversations consistently referred to the under-exploitation of learners' skills, devices and technical knowledge when it came to the use of learning technology.

> "The greatest resource available to FE and Skills providers in this domain is their learners. More effort needs to be made to engage and

[11] A mobile pedagogy is defined as a pedagogy which employs the characteristics and affordances of mobile devices (typically these include tablets, smartphones and laptop computers) to enhance learning. Key opportunities that are claimed for it include: encourage anytime, anywhere learning; reach underserved children; improve 21st century social interactions; fit with learning environments; and enable a personalised learning experience.

> empower learners' use of digital technology - and the use of their own devices – in the learning process." (*FELTAG, 2013, p 5*)

In their paper on 'Increasing student voice and empowerment through technology', Browne and Millar (2019) took up the same theme, referring to the work of a variety of researchers and educators, including that of Paolo Freire. Some 50 years ago, Freire put forward the concept that: "Through dialogue, the teacher-of-the-students and the students of the-teacher cease to exist, and a new term emerges: teacher-student with students- teachers." (Freire, 1970)

Browne and Millar extend Freire's concept in two ways. Firstly, they argue that the use of technology enables students to be more engaged in classroom participation and dialogue. The democratic classroom, where every learner has a voice, becomes more feasible when conversational technologies are employed to empower students whose voices may previously have gone unheard. The use of assistive technologies offers new opportunities for those who are reluctant or who have disabilities, to speak, discuss and learn.

And, secondly, the authors present a small-scale case study of the activities of the student Digi-pals in an FE college. The five students, selected for their technological expertise and ability to communicate it, became part of the college e-Learning department and were consulted on all matters digital. The Digi-pals work with those new to teaching and offer them support and guidance. This collaborative arrangement provides the opportunity for those new to teaching to establish collaborative relationships with their learners. The college places the Digi-pals in a position of authority and recognises them as change agents within the institution.

Browne and Millar conclude that innovations in student involvement such as these must become standard practice if the sector is to embrace and benefit from the enhancing power of new technology. Learners should not be given a voice, not in a merely tokenistic way, but rather in a way which fosters a collaborative learning community.

Addressing failure: transformative learning using assistive technologies

Scott (2016 and 2018) presents a small-scale case study of how an online social network supported the classroom learning experienced by students undertaking the GCSE English re-sit. The study compares uses of the network between 16-19-year-olds and adults in an FE college. It included a content analysis of communication posts across two years and four separate groups (n = 87) using the social network Edmodo.com. This was complemented by interviews with 15 students and observations of blended (classroom-based) use of the network. Inherent to the study was the problem of engagement and motivation among students who, given past failures, were ambivalent to this compulsory curriculum. Essentially, the course design was framed to give students mobile access to a learning community, a teacher and a curriculum through a social network where a continual educational dialogue could be open and sustained. Using digital technology, provision was adapted so that it was modelled less on school delivery and more on promoting employable self-regulatory skills.

Although it was not the purpose of the study to quantify use of the network with success on the course (measured as a C grade), the adults were highly successful in each phase and the higher engaged students in both populations almost all passed at the required

"C" or above level. This suggests that the network offers a layer of support, which may be labelled as engagement, whether by enabling a link between sporadic and intensive sessions or by a teacher being available to answer and clarify.

> "When technologies like … social networks become learning tools they give options beyond the spatial and temporal boundaries of classroom lessons to promote flexible access in keeping with adults' approaches to learning. A sense of agency is promoted that allows for differentiated approaches." (*Scott, 2018*)

Immersive technologies

Perhaps potentially the most pedagogically helpful are immersive technologies such as Virtual reality (VR) or Augmented reality (AR). which allow "entry" into environments that cannot be generated in real world conditions because of various impracticalities. Such technologies enable, for example, experiments that would otherwise be too dangerous to be safely conducted. Courses such as engineering, construction, or hospitality and catering can be successfully delivered online by means of a pedagogy which employs immersive technology (Jisc, 2020d).

They offer the promise of richer learning experiences for learners and interesting possibilities for remote learning (Jisc, 2019). This echoes the earlier findings of the Commission on Adult Vocational Teaching and Learning (CAVTL) (2013) that they had "been particularly struck by the potential of digital simulations to complement real work experience and to offer a pedagogically valuable way for vocational learners to practise and be assessed safely". There is a considerable body of studies, for example, where immersive technology has been used in the field of maintenance and assembly (Sirakaya and Cakmak, 2018).

2.8 Conclusions

- **All the evidence indicates that fundamental pedagogical principles (as exemplified, for example, in the Teachers' Standards and the Ofsted Inspection Framework) should apply with equal force to both face-to-face and online / blended learning.** The principles do not change when moving to an online environment, but there are some difficulties in ensuring that they are robustly applied. This is especially the case with two significant issues – teacher presence and interaction not only between teacher and learners, but also between learners. The CoI model, and to a lesser extent the TPACK model, have provided a framework for studies addressing these issues during the last 20 years.

- **There are a number of initiatives seeking to develop what are currently little utilised applications of digital educational technology**. Of these, mobile pedagogy and immersive (AR and VR) approaches appear to be potentially the most fruitful. The DEIMP, however, is still on a small scale and in its early stages; and there are issues about the expense involved with AR and VR technologies.

Chapter 3: Effective and high quality online pedagogy

Summary

Attempts to develop over-arching frameworks for evaluating online and blended learning have not been notably successful. This chapter briefly considers two of them, one of which focuses heavily on the teacher's role. The other framework offers more possibilities, in that it is more successful in encompassing the various aspects of online / blended learning and their interconnectedness. But there is no evidence about how helpful or otherwise it may have been in practice. Being aware of the "learners' voice" and meeting the needs of all learners are important elements of effective and high-quality provision. So too is robust design and planning. The chapter details the findings of a large-scale Education Endowment Foundation (EEF) review on what makes for good practice; and maps a number of the characteristics of online pedagogy against the Ofsted inspection framework.

A number of key points are highlighted in this chapter, notably:

- that although their preference is for face-to-face teaching and learning, learners report a generally high level of satisfaction with the quality of the digital teaching and learning they had experienced
- despite their caveats on the quality of much the evidence they retrieved, the EEF review raises some significant issues relating to the effectiveness of online pedagogy; in particular their findings that:
  - there was no evidence that any one medium or delivery mechanism was particularly successful at improving student outcomes
  - teaching quality is more important than how lessons are delivered
  - the importance of peer interaction
  - the need to provide support for students who are working independently.

3.1 Evaluation frameworks

Described below are two examples of possible frameworks for evaluating the quality and effectiveness of digitally based teaching and learning.

3.1.1 Evaluating blended learning

Having identified a number of the many frameworks and instruments for evaluating blended learning, mainly in the context of HE but with wider applicability, Bowyer and Chambers (2017) concluded that there was no particular one that appeared to be

favoured in the literature. Partly, they suggest, this is due to the diversity of functions different evaluations are designed to serve; for purposes of accountability, improvement or marketing.

In developing an alternative framework, the authors stressed that it is important that any framework encompasses all aspects of the blended learning situation so that the interconnectedness is not lost. This approach still enables individual evaluations to focus on specific elements of a blended learning programme, but allows the researchers to see where these elements are situated within the wider context of blended learning, subsequently making it easier to identify omissions and acknowledge limitations. Additionally, they consider that a coherent overall framework permits researchers and evaluators to easily identify the relationships between different aspects of blended learning systems, such as between the institutional context and the support tutors are given when designing and implementing a blended learning programme.

One way to conceptualise this is to categorise a framework into three spheres of concentric influence so that any evaluation can focus on a particular perspective but acknowledge the influence of other elements of the framework.

1. The outer sphere is **situation**: this encompasses the wider context as well as institutional elements.

2. The mid-sphere is **course organisation**: this contains design and planning, content, technology and assessment.

3. The inner sphere is **individual perspectives**: this focuses on the learner and teacher elements but also contains the crucial features of communication, interaction and collaboration which operate at this level.

The spheres can be thought of as the independent variables: the inputs and processes that form the facets of the blended learning programme. There is also the core of the sphere: this contains the **outcomes**, namely learner satisfaction, student engagement and course outcomes.

The authors claim that this framework can be used beyond blended learning and can be applied to other technology-based learning situations.

These spheres and elements are detailed, along with suggestions for measurement, as in the example below which addresses the wider context and the institutional elements of the evaluation (Table 4).

Table 4: Evaluating blended learning – the wider context

Level	Variable	Elements	Measurement
Situation	Context	Socio-economic Ethical Legal Cost Accessibility Cultural Geographical Support	Can be investigated by independent evaluation based on full knowledge of the programme's context but more likely through interview with, or questionnaire for, course administrators and/or teachers.
	Institution	Support Administration	Can be measured through self-report questionnaires, interviews or focus groups with course administrators and/or teachers.

Source: adapted from Bowyer and Chambers, 2017

3.1.2 Developing an online teaching effectiveness scale (OTES)

In their paper on developing an OTES, Reyes-Fournier et al (2020) argued that the currently available measures of online teaching effectiveness (OTE) had several flaws. These included a lack of psychometric rigour and high costs, but in particular the authors claim that:

- There has been too great a reliance on frameworks which were designed to evaluate traditional face-to-face teaching effectiveness. As a result, the unique features of OTE have been ignored. "In essence, in terms of assessment, online teaching effectiveness has been treated as a virtual extension of on-the-ground teaching effectiveness, rather than as the unique instructional phenomenon that it is." (Reyes-Fournier et al, 2020, p 112)

- Attempts to create a measure for OTE have tended to focus on evaluating the course and student effort rather than the effectiveness of the teacher. The face-to-face teaching paradigm has been imported with little modification and applied to OTE, even though online teaching diverges from face-to-face teaching in substantive ways.

Following a review of existing OTE research and using their experience as online teachers, the authors sought to develop a more valid online teaching effectiveness scale. The first stage was to produce a precise definition of what was meant by OTE. This consisted of four factors: presence, engagement, expertise and facilitation. Using this definition, the researchers developed a set of 12 pilot items which were used by a

selection of American university students (N = 213) to rate the effectiveness of their teachers.

Presence proved to be the most important factor. It included items measuring instructors' ability to share relevant experiences and provide meaningful examples to illustrate course material, present information creatively, and communicate enthusiasm for course topics. The total OTES score consisted of the sum of the four factors (presence, engagement, expertise and facilitation) and should, the authors claim, succinctly and accurately indicate overall OTE.

The authors argue that their analysis supports the theoretically-established understanding that online teaching requires different teacher qualities than on-the-ground teaching, and that the OTES establishes a new framework for effective online teaching. It appears, they claim, to be a robust measure capable of assessing OTE among students from various backgrounds and education levels.

Although the framework as developed by Reyes-Fournier et al is potentially applicable not only at a university level but across a range of online settings and FE, it does have some limitations. It is not alone, for example, on being heavily focused on what the teacher does rather than what the students learn. The evaluation criteria are open to more than one interpretation and, unless some form of moderation is built into the process, the outcomes are unlikely to be very high on any reliability scale.

3.2 The "learners' voice"

Between October 2019 and May 2020, 19,137 learners in 36 FE and sixth form colleges from across the UK (12 per cent of the total) took part in the Jisc Learner digital experience insights survey (Jisc, 2020c). Of the learners who completed the survey, 65 per cent did so before the lockdown on 23 March 2020 and the move to off campus learning; 35 per cent completed it on or after this date. The Covid-19 pandemic was clearly a unique factor, but the report of the survey does not attempt to analyse its possible impact on learners. The report argues that while it may have influenced the responses of some learners, attitudes and opinions generally take longer to form and it would be methodologically unsound to assume that responses relate specifically to a pre- or post-Covid-19 experience.

Taking the survey period as a whole the results indicated a high level of learner satisfaction with the quality of the digital teaching and learning they had experienced. It was regarded as "good", "excellent" or the "best imaginable" by 76 per cent. Only 5 per cent rated it as "poor", "awful" or the "worst imaginable". Answering the question on what they found most useful, their responses were:

- practice questions online (25 per cent)
- interactive polls or quizzes online (25 per cent)
- course related videos (25 per cent)
- time working online with other students (15 per cent)

- references and readings (10 per cent).

In their small-scale qualitative review of online education in 20 volunteer colleges and other providers, Ofsted asked learners about what was working well and what not so well (Ofsted, 2020). The review included remote discussions with learners, managers and teaching/training staff, as well as "observations" of lessons, sessions and other interactions. Ofsted reported that although learners prefer "live" online lessons, rather than recorded lessons, they miss the face-to-face contact of the classroom. They miss not only the social interaction but also the instant feedback and opportunity to ask questions that the classroom provides. "[They] told us that using online chat during sessions does not replace the classroom experience. However, some did point out that the opportunity to send the teacher private messages is useful because it allows them to ask for help discreetly". (Ofsted, 2020)

3.3 Characteristics of effective and high quality online and blended FE delivery

There is a note of caution in some of the literature about the need for care when assessing issues of effectiveness. The analysis of the Transforming Learning Cultures in Further Education (TLCFE) project[12] showed that a distinction between effectiveness and value of learning is vital in any judgement of the quality of provision. "High synergy between a college-based programme and the needs, expectations and culture of the workplace appeared to be a necessary but not a sufficient condition for high quality vocational programmes" (James and Unwin, 2016). There are instances, for example, where although workplace connection and relevance are high, some of what students learn gives cause for concern. An example was a childcare course which, although successful from the employer viewpoint and in terms of college systems, also contributed to maintaining gender inequalities and expectations of low pay.

3.3.1 Design and planning

> "We know from research that effective online learning results from careful instructional design and planning, using a systematic model for design and development." *(Hodges, et al, 2020*)

Although the authors teach in HE institutions in the USA, they recognise that the importance they, and other researchers they cite, assign to robust planning is not confined to HE but applies across the education sector. The design process and the careful consideration of different design decisions will inevitably have an impact on the quality of the teaching.

[12] TLCFE was a four-year (2001-2005) study of teaching and learning cultures in FE primarily in England but with specific extensions in Wales and Scotland. It involved four universities and four participating FE colleges and was structured around three key questions: What do learning cultures in FE look like and how do they transform over time? how do learning cultures transform people? how can people (tutors, managers, policy makers and students) transform learning cultures for the better? The study identified four 'drivers' as routes for improvement in the quality of teaching and learning: 'maximising student agency'; 'maximising tutor professionalism'; 'improving pedagogy'; and 'enhancing positive aspects of the learning culture'.

Quoting Means et al (2014), the authors identify nine dimensions, each of which has numerous options, highlighting the complexity of the design and decision-making process. The nine dimensions are: modality, pacing, student-instructor ratio, pedagogy, instructor role online, student role online, online communication synchrony, role of online assessments, and source of feedback. Within each of these dimensions there are options; and to complicate matters further, one option may depend upon another. Class size, for instance, may greatly constrain the pedagogy. Strategies such as providing effective practice and feedback will become harder to implement as class size grows.

3.3.2 Meeting the needs of all learners

One of the key questions at a Jisc roundtable of FE and university leaders was reported as: "What does a minimum standard of technology-enabled learning look like?". The response was the need for a baseline agreed by the sector itself; and the consensus was that a blended experience designed to be accessible by the most disadvantaged should act as the baseline (Jisc, 2019).

Ofsted reported that generally speaking, learners at levels 1 and 2 have engaged less well with the technology necessary for online learning than those at level 3 (Ofsted, 2020). They found that for learners who have special educational needs and/or disabilities (SEND) or high needs, there has often been a focus on learning activities they can carry out in their own homes.

The Australian Council for Educational Research (ACER) found that, when they and their teachers have the right training and preparation, older learners retain more knowledge from online learning than in the face-to-face classroom. Younger learners, however, require a more structured environment with scaffolding and support (quoted in Cowden et al, 2020). Pure online provision has also been found to be less suitable for disadvantaged learners because they require more one-to-one support.

More detailed analysis has been carried out by a number of researchers (Sharpe et al, 2019; Rizvi et al, 2019; and Parsons, 2017). In their study across six FE colleges in England, Scotland and Wales; 218 learners; and five subjects Sharpe and her colleagues found that technology usage differed significantly between the male and female students. Overall, they suggested, "it appears that female students are less likely to exploit the educational affordances of the emerging technologies as intensively as their male counterparts". They also found that the subjects students were studying had an impact on their use of and approach to digital technology. Health-related course learners, for example, were more likely to be reserved users:[13] whereas sociology learners were more likely to be pragmatic users and less likely to be reserved users than learners from other disciplines (Sharpe et al, 2019).

> "These findings direct attention towards the largest cluster of learners - the mainstream pragmatists - who are using a limited range of technologies in superficial, passive and perhaps unimaginative ways. For these learners, we might expect that their experiences of formal

[13] "Reserved users" were defined as students who reported using a narrow range of standard technologies for study purposes, restricted to general computing applications. "Pragmatic users" were using a wider range of digital tools and also added a virtual learning theme to their use.

> education would be influenced to a large extent by the activities designed by their tutors and the environments provided by their institutions. The role of the lecturer is likely to be crucial in expanding the digital practices of such students." (*Sharpe et al, 2019*)

In her study of the use of virtual learning environments (VLEs), Parsons (2017) referred to the considerable body of research relating to online learning and accessibility. She noted three commonly discussed issues that were identified in the literature. First, that some practices in online provision may lead to learners with a disability being marginalised. A second issue relates to people with one type of impairment being treated as a homogenous group. This, Parsons notes, fails to recognise the idiosyncrasies in both impairments and preferences of individual users. Blind people, for example, have different needs from people with low vision. And, thirdly, features such as web pages crowded with text, links, pop-up windows and menus, may make some online learning environments inaccessible. The literature review indicated, however, that research into VLE use in FE was limited compared to other learning contexts, particularly HE.

The main drive for Parsons' research was to increase understanding of online learning provision and the wider implementation of VLEs in FE in England. The intention was to identify the barriers to students' use of VLEs, specifically in an FE context. Her analysis of the student survey and the teacher interviews highlighted that the factor which had most impact on students' engagement with Moodle was course design; and, in particular, the aspects of accessibility, pedagogy and consideration for students' needs (Parsons, 2017).

The study was conducted in a large English FE college, but was small-scale, involving 60 students mostly 16- to 20-year-olds, and seven teachers. It was further constrained in that although a proportion (19 per cent) of the student respondents considered themselves to have a disability the data did not indicate the type of disability. This inevitably limits the scope of the conclusions.

Whilst there is a body of research on learners' attitudes, use of and potential difficulties with online and blended learning, there is less evidence in the literature relating to the ways in which these differences might be being addressed by programme designers and teachers. Organisations such as EEF (2020), Jisc and ETF have, however, highlighted the issue and provided training materials for teachers. ETF (2020), for example, stresses that teachers should be supported to consider which approaches are best suited to the content they are teaching and the age of their students. They quote the example of games for learning which were found to have a high impact on vocabulary learning in foreign languages, but there is less evidence concerning their use in other subjects.

ETF has also developed a competency framework the Digital Teaching Professional Framework (DTPF) for teaching and training practitioners across all parts of the FE sector (see also section 6.1). This provides a number of examples to indicate how online / blended FE delivery pedagogical techniques might be modified in order to meet the differing needs of learners. It stresses, for example, the need to "continuously monitor and reflect on the suitability of the measures implemented to improve accessibility and adapt strategies accordingly." (ETF, 2018)

3.3.3 What does "good practice" look like?

The characteristics of good practice identified below, albeit with a number of caveats, are adapted from the EEF's evidence assessment of remote learning (2020). The review was in response to the impact on schools of the Covid-19 pandemic, but all of the studies included were conducted prior to the outbreak. Their report summarises the findings from 60 systematic reviews and meta-analyses from 2005 or later under five key topic areas: general remote teaching and learning; blended learning; computer-supported collaborative learning; computer assisted instruction; and educational games.[14] The review was intended to focus primarily on school-aged education and was international in scope. But it found few high-quality studies that had looked at remote learning in the school sector. Many of the reviews that were included, therefore, combine evidence from school-aged education, university education and adult learners.

One of the main concerns of the reviewers was the low quality of review methods amongst the retrieved studies. They found that almost none of the studies applied any kind of risk of bias assessment for the included studies. These limitations notwithstanding, the reviewers concluded that the report "summarises evidence that may support teachers in making decisions related to remote instruction during periods of school shutdown." (EEF, 2020)

A further caveat is that studies which examined specific differences in distance learning implementation found limited results. Evidence was mixed and inconclusive, for example, between synchronous, asynchronous or mixed instruction. There was no evidence that any one medium or delivery mechanism was particularly successful at improving student outcomes.

The key findings and implications of the review were:

1) Teaching quality is more important than how lessons are delivered

- Ensuring the elements of effective teaching are present – for example clear explanations, scaffolding and feedback – is more important than how or when they are provided. There was no clear difference between teaching in real time ("synchronous teaching") and alternatives ("asynchronous teaching"). For example, teachers might explain a new idea live or in a pre-recorded video. But what matters most is whether the explanation builds clearly on learners' prior learning or how learners' understanding is subsequently assessed.

2) Ensuring access to technology is key, particularly for disadvantaged learners

- Many reviews identify lack of technology as a barrier to successful remote instruction. It is important that support is provided to ensure that disadvantaged learners – who are more likely to face these barriers – have access to technology.

[14] The protocol for the rapid evidence assessment is at: https://educationendowmentfoundation.org.uk/public/files/Campaigns/Distance_Learning_Rapid_Evidence_Assessment_Protocol.pdf (Accessed 25.3.21)

- In addition to providing access to technology, ensuring that teachers and learners are provided with support and guidance to use specific platforms is essential, particularly if new forms of technology are being implemented.

3) Peer interactions can provide motivation and improve learning outcomes

- Multiple reviews highlight the importance of peer interaction during remote learning as a way to motivate learners and potentially improve outcomes.

- Across the studies reviewed, a range of strategies to support peer interaction were explored, including peer marking and feedback, sharing models of good work, and opportunities for live discussions of content. Peer marking was identified as a promising component of some blended learning schemes – particularly when work and feedback are anonymised. The results of the meta-analysis of studies in HE reviewed by EEF indicated that peer evaluation activity had a medium effect. “The average effect size value was 0.675 with a standard error of 0.156, showing that the peer evaluation activity in blended learning environment had the moderate impact on students’ learning achievements.” (Cui and Zheng, 2018) In a further paper, the same researchers reported that “synchronous discussion between the assessors and [those being assessed] significantly improved the students' writing performance, especially content writing skills, affective and meta-cognitive feedback quality, meta-cognitive awareness and self-efficacy.” (Zheng et al, 2018)

- The value of collaborative approaches was emphasised in many reviews, although notably many studies involved older learners. Different approaches to peer interaction are likely to be better suited to different age groups.

- There is some evidence that encouraging peer interactions can lead to improved learning outcomes, particularly for older learners, and that prompting learners to reflect on their own learning during remote learning may be an effective approach.

4) Computer-supported collaborative learning (CSCL)

- The impact of computer-supported collaborative learning has mainly been reviewed in science, technology, engineering and mathematics (STEM) subjects and language learning.

- Across multiple approaches and reviews, aspects of collaborative learning or peer to peer interaction are identified as leading to improved educational outcomes for students. The evidence for CSCL approaches is consistently positive across the included reviews.

- There is some evidence that shared online workspaces like Google Docs can support learning, particularly for older learners. For example, video conferencing had a large positive impact when paired with shared online workspaces, for

example, Google docs. When video conferencing was only supported by email communication, there was no evidence of impact.

5) Learners working independently need support

- Students learning at home will often need to work independently. Multiple reviews identify the value of strategies that help students work independently with success. For example, prompting learners to reflect on their work or to consider the strategies they will use if they get stuck have been highlighted as valuable.

- Wider evidence related to metacognition and self-regulation suggests that disadvantaged learners are likely to particularly benefit from explicit support to help them work independently, for example, by providing checklists or daily plans.

6) Different approaches to remote learning suit different tasks and types of content

- Approaches to remote learning vary widely and have different strengths and weaknesses. Teachers should be supported to consider which approaches are best suited to the content they are teaching and the age of their students.

- For example, games for learning were found to have a high impact on vocabulary learning in foreign languages, but there is less evidence related to their use in other subjects.

- Using technology to support retrieval practice and self-quizzing can help learners retain key ideas and knowledge, but is not a replacement for other forms of assessment.

(Adapted from Education Endowment Foundation, 2020)

3.4 The Ofsted Education Inspection Framework

The Ofsted Inspection Framework (2019) sets out the criteria on which judgements about the quality of education will be made under three headings: intent, implementation and impact. The same evaluation criteria and considerations apply equally to online and blended teaching and learning. Table 5 maps the Ofsted Inspection Framework criteria against the characteristics of high quality online and blended FE pedagogy.

Table 5: Characteristics of high quality online and blended FE pedagogy and Ofsted criteria

Ofsted Education Inspection Framework (Ofsted, 2019a)	Characteristics of effective and high quality online and blended FE pedagogy
Intent	**Intent**
Leaders take on or construct a curriculum that is ambitious and designed to give all learners, particularly the most disadvantaged and those with special educational needs and/or disabilities (SEND) or high needs, the knowledge and cultural capital they need to succeed in life.	Teachers need to be involved in design and planning so that pedagogy and technology fit with instructional needs.
The provider's curriculum is coherently planned and sequenced towards cumulatively sufficient knowledge and skills for future learning and employment.	The dimensions of the design and decision-making process: modality, pacing, student-instructor ratio, pedagogy, instructor role online, student role online, online communication synchrony, role of online assessments, and source of feedback. (*Means et al, 2014; Hodges et al, 2020*)
The provider has the same academic, technical or vocational ambitions for almost all learners. Where this is not practical – for example, for some learners with high levels of SEND – its curriculum is designed to be ambitious and to meet their needs.	Use digital technologies and strategies, e.g. assistive technologies, designed for learners in need of special support (e.g. learners with physical or mental constraints; learners with learning disorders). *(Digital teaching professional framework: Guide for teachers and trainers, Education & Training Foundation, 2018)*
Learners study the full curriculum. Providers ensure this by teaching a full range of subjects for as long as possible, 'specialising' only when necessary.	
Implementation	**Implementation**
Teachers have good knowledge of the subject(s) and courses they teach. Leaders provide effective support for those teaching outside their main areas of expertise.	Application of the CoI and TPACK models (Garrison et al; Mishra and Koehler, 2006)

Ofsted Education Inspection Framework (Ofsted, 2019a)	Characteristics of effective and high quality online and blended FE pedagogy
Teachers present subject matter clearly, promoting appropriate discussion about the subject matter they are teaching. They check learners' understanding systematically, identify misconceptions accurately and provide clear, direct feedback. In doing so, they respond and adapt their teaching as necessary, without unnecessarily elaborate or differentiated approaches.	Using the potential of technology to improve both assessment and feedback, particularly in terms of speed and efficiency.
Over the course of study, teaching is designed to help learners to remember in the long term the content they have been taught and to integrate new knowledge into larger concepts.	The online teacher uses digital pedagogical tools that support communication, productivity, collaboration, analysis, presentation, research, content delivery, and interaction. (US National standards)
Teachers and leaders use assessment well, for example to help learners embed and use knowledge fluently or to check understanding and inform teaching. Leaders understand the limitations of assessment and do not use it in a way that creates unnecessary burdens for staff or learners.	Implementation of the Immersive digital engagement / experience (QAA, 2020)
Teachers create an environment that allows the learner to focus on learning. The resources and materials that teachers select – in a way that does not create unnecessary workload for staff – reflect the provider's ambitious intentions for the course of study and clearly support the intent of a coherently planned curriculum, sequenced towards cumulatively sufficient knowledge and skills for future learning and employment.	
A rigorous approach to the teaching of reading develops learners' confidence and enjoyment in reading. At the early stages of learning to read, reading materials are	

Ofsted Education Inspection Framework (Ofsted, 2019a)	Characteristics of effective and high quality online and blended FE pedagogy
closely matched to learners' phonics knowledge.	
Impact	**Impact**
Learners develop detailed knowledge and skills across the curriculum and, as a result, achieve well. Where relevant, this is reflected in results from national tests and examinations that meet government expectations, or in the qualifications obtained.	A number of references in the literature (e.g. Scott, 2016, 2018) to the fact that in using digital technology as part of the learning process students are also developing skills much in demand in the world of work.
Learners are ready for the next stage of education, employment or training. Where relevant, they gain qualifications that allow them to go on to destinations that meet their interests, aspirations and the intention of their course of study. They read widely and often, with fluency and comprehension.	

3.5 Conclusions

- **The characteristics of high quality online pedagogy are not fundamentally different from those in more conventional forms of educational delivery**. In some cases, however, teachers have had to adapt quickly, and there is evidence that even experienced teachers sometimes lack confidence in their ability to teach remotely.

- **There are a number of studies that indicate that various factors such as age, gender, physical impairment and level of achievement impact upon learners' success with online learning**. There is sparse evidence, however, about how the design, planning and delivery of online and blended learning is being adjusted by course developers and teachers to take account of these differences.

- **Few researchers distinguish between the FE and HE sectors, conflating them together as "tertiary".** Nevertheless, although it is necessary to exercise a degree of caution, the key pedagogical elements that distinguish high quality online teaching and learning are likely to apply equally whether in a school, college or HE institution context.

Chapter 4: Assessment

Summary

This chapter discusses the current and potential use of technology to support formative assessment, feedback, and high-stakes summative assessment. Based in the literature reviewed, this section considers what types of assessment activities are both meaningful and feasible with digital technology; the barriers to successful implementation; and some possible solutions.

A number of key points are highlighted in this chapter, notably:

- the need for assessment to change in online and blended FE environments – the use of, for example, e-portfolios and functional skills assessments
- the barriers to the adoption of online assessment for high-stakes qualifications such as GCSE and A level in schools and colleges in England, and ways in which they have been addressed in other jurisdictions
- ways in which technology might make for more effective formative and summative assessment.

4.1 How does assessment work in online and blended FE environments?

Assessment needs to change for a digital age — both the use of technology to support formative assessment and rapid feedback, and a rethinking of what kinds of assessment tasks are meaningful and possible with digital technology (Jisc, 2019).

The use of online/onscreen assessment is not always the result of an online or blended course. For example, online assessments of English and maths functional skills may just be the end-point assessment, following a face-to-face course with little or no technology enhanced learning involved. In both FE and HE, assignments submitted for assessment purposes may be uploaded via digital platforms, such as Moodle or to e-portfolios, or use integrated software packages such as Turnitin. These can be for formative or summative assessment purposes. Level 4 apprenticeships use online EPA (end-point assessment); for example, online knowledge-based tests, or online interviews where interviews form part of the assessment[15].

City & Guilds have recently launched their EPA online tool that delivers some portion of formative and summative assessment online for their apprenticeships, and other end-point assessors will no doubt have a similar offer. Equally, during the Covid-19 pandemic, professional bodies and HEIs have needed to move, for example, professional interviews

[15] cg-ilm-8-step-guide-epa-pro-pdf.ashx (cityandguilds.com)

or the assessment of advocacy skills to online platforms such as Zoom or Teams to replicate a face-to-face, in-person assessment experience. Online proctoring has been used by some professional bodies where online, summative assessment has needed to replace paper examinations during the Covid-19 pandemic.

Barriers to the adoption of high-stakes summative assessment online are chiefly; organisational culture, infrastructure and readiness (FE/HE -Jisc, 2020d); and issues of security and authentication (HE focus - Crawford and Butler-Henderson, 2020).

In their review of international literature on online assessment, Crawford and Butler-Henderson (2020) identify the move to online/ blended learning as the major driver for online assessment, accelerated by the Covid-19 pandemic, and the desire for 'authentic' assessment and learning, closer to real world assessment and work. Across the thirty-six papers reviewed nine key themes emerged: student perceptions, student performance, anxiety, cheating, staff perceptions, authentication and security, interface design, and technology issues. Students' perceptions of online assessment were largely positive reporting, for example, speed and ease of revisions and a more positive and authentic experience than with paper assessments; but, as was also seen in staff perceptions, the majority felt it was easier to cheat. Several of the studies reported a lack of variation of scores across online and paper assessments; for some students anxiety was reported as reduced within the online environment; and the inclusion of navigation and auto-save tools was considered by both students and staff as essential functionality for online assessments.

Ofqual (2020) acknowledge that while there is a broad body of research analysing the potential benefits and challenges of, and motivations for, using onscreen and online assessment across a range of contexts, there has been little progress in the implementation of these for high stakes, sessional qualifications (such as GCSE and A level) in England. Acknowledging Ofqual's regulatory role, their report does not advocate for or against adoption of such changes, but rather considers what is driving or preventing change, given the potential to increase the validity of assessment, and promote discussion. They also identified barriers relating to infrastructure, appetite and demand for change, and fairness. In jurisdictions where barriers had been overcome, Ofqual (2020) suggests that most or all of the following had been put in place:

- jurisdiction wide initiatives led by a sponsoring national or regional government or awarding organisation, often in collaboration – which feature: investment in school/college infrastructure and online or on-screen systems, well considered risk appetite including an acceptance that things may go wrong, and system leadership

- a vision that assessing on-screen or online matches wider societal changes and needs, including those of students and employers and that the anticipated benefits justify the investment and required appetite for risk

- redesign or reconsideration of what should be assessed to forms which support on-screen or online assessment methods

- significant engagement and communication activities with key stakeholders, often inviting early adopters to play an influential part in the roll out of programmes or pilots
- thorough testing and piloting of new software and systems used
- practice platforms for students to become familiar and confident in the use of new software and devices
- a high degree of student input during transition
- clear understanding of roles and responsibilities between all those with a role in successful delivery including schools, colleges, awarding organisations, government, regulators, and teachers
- clear advice and support for teachers, IT support staff, exams officers and invigilators on expectations of them prior to and on the day of the assessment
- robust disaster recovery and risk management plans and mitigations, which stakeholders have confidence in, if things go wrong (Ofqual, 2020, pp.5-6).

4.1.1 Formative assessment

There is evidence of some innovation in the use of technology for formative assessment within FE. For example, Bolton College have been experimenting with natural language processing and classification software that provides automated feedback for responses to open-ended questions in formative assessment (Jisc, 2020d). Funded action-research projects undertaken by consortia of FE providers and disseminated on the ETF website include looking at the effectiveness of assessment feedback via digital mediums, and how to engage staff. One project looked at the impact of audio and video rather than written feedback on assessments.

Although students scored written and digital feedback almost the same for accessibility, in most other areas digital feedback scored more highly. Teachers taking part overall reported preferring digital feedback because of the quantity and quality of feedback they could give. Time taken to train staff to give digital feedback and to manage the change process were considered important factors to balance against the benefits of digital feedback.

Online quizzes, using software packages such as Kahoot, and on VLEs, such as Moodle have been used for some time in FE. Luxton, Roberts and MacDonald (Impact – Chartered College of Teaching, 2019) each reported on the use of different software packages for formative assessment in three separate secondary schools. The studies focused on the use of apps to create tests, and found that especially when student led, they improved vocabulary acquisition, and retention and retrieval of key information. Misconceptions and weaknesses were identified. Where quizzes were created by students, self-identification of weaknesses and understanding of common misconceptions improved, deepening overall understanding of curriculum. There was reduced preparation time for teachers and the software facilitated quick testing and

feedback allowing teachers to direct students to specific tasks/ areas of the curriculum to reinforce learning or address weaknesses. The formative assessment made it easier to identify students who were struggling.

4.2 Effective assessment techniques in online/blended FE environments

Technology has the potential to improve assessment and feedback, which are crucial elements of effective teaching. However, how teachers use information from assessments, and how learners act on feedback, matter more than the way in which it is collected and delivered.

- Using technology can increase the accuracy of assessment, and the speed with which assessment information is collected, with the potential to inform teachers' decision-making and reduce workload
- Technology can be used to provide feedback directly to learners via programmes or interventions, but in all cases careful implementation and monitoring are necessary
- Feedback via technology is likely to be most beneficial if it supplements, but is aligned to, other forms of feedback.

(Sharpe et al 2019)

It is noted in the Jisc report 'The Future of Assessment' (2020d) that good practice in high-stakes summative assessment exists in "small scale pockets of activity rather than organisation wide examples". The report goes on to note that this is not altogether surprising:

> "Innovation can also be stifled by education policies that focus on high-stakes, end-point assessments, particularly in FE. The maturity and suitability of the technology is not yet a given in all areas. Logistical difficulties should not be underestimated... It will take time and investment to create an environment where new forms of assessment can be introduced and scaled up…Digital technologies offer the possibility of making assessment more authentic and less burdensome for all involved. Indeed, there is a risk that the sector faces being rapidly left behind if we do not start preparing to tackle assessment in significantly different ways." *(Jisc, 2020d, p7*)

The report sets out five key principles and proposed targets for effective online assessment underpinned by The Assessment and Feedback Lifecycle originally developed by Manchester Metropolitan University (MMU) in 2015. The eight main stages in the lifecycle were considered to apply equally to assessment and feedback in FE and HE. The eight stages identified were: specifying, setting, supporting, submitting, marking

and production of feedback, recording of grades, returning marks and feedback, and reflecting (Jisc, 2020d). It was also considered that within these processes, student tracking against outcomes, predefined by awarding organisations, were of great significance for FE.

The report asserts that technology can transform assessment making it more:

- **authentic** (testing knowledge and skills in realistic/ contextualised way and meeting employers' needs): assessments designed to prepare learners for what they do next, using technology they will use in their careers

- **accessible to all** (including people with disabilities/ mental health challenges): assessments designed with an accessibility-first principle

- **appropriately automated** (easing marking and feedback workload and giving quicker, more detailed and more actionable feedback): a balance found of automated and human marking to deliver maximum benefit to students

- **continuous** (to replace high-stakes exams and promote lifelong learning to increase ability to adapt to changes in work): assessment data used to explore opportunities for continuous assessment to improve the learning experience

- **secure** (right student, right assessment and abide by rules): authoring detection biometric authentication adopted for identification and remote proctoring.

(Jisc, 2020d)

4.3 Conclusions

- **The move to online/ blended learning is seen as a major driver for online assessment, accelerated by the Covid-19 pandemic**. A number of commentators argue that technology could transform assessment in a number of fruitful ways. But, the evidence indicates that how teachers use information from assessments, and how learners act on feedback, are of more significance than whether the assessment and the feedback are in digital or some other form.

- **There is evidence of some innovation in the use of technology for formative assessment,** exploring, for example, the effectiveness of different forms of assessment feedback via digital mediums. There is evidence that both students and teachers welcome the additional strategies for providing informative feedback that technology can provide.

- There is a broad body of research on formative and summative assessment generally, but **there is a gap in the academic literature reviewed about online or digitally supported formative and summative assessment in an FE context.**

Much of the grey literature focuses on the outcomes from small-scale, action-research projects undertaken in the sector, and brief overviews are disseminated. But there is a lack of robust FE specific research in this area.

- **The barriers to the adoption of high-stakes summative assessment online** are chiefly: organisational culture, infrastructure and readiness, and issues of security and authentication. Despite considering there to be many potential benefits to online assessment, the opportunity for malpractice is seen as a major concern for many stakeholders.

Chapter 5: Professional development and support

Summary

This chapter considers the core components and approaches for effective professional development (PD) for teaching in an online environment drawn from the literature. It also considers the PD needs of staff in FE and what types of training and support is already available.

At its broadest level, PD to support blended and online learning can be defined as supporting teachers to:

- learn about (technology)/ learn with (pedagogy): develop their own knowledge of, and competency in, digital literacy/skills; learning using digital media (such as online professional development)
- teach about (technology)/ teach with (pedagogy): support students' knowledge and use of digital literacy/skills; developing digitally enhanced/transformed teaching and learning using technology.

A number of key points are highlighted in this chapter, notably that:

- the recognition that teachers in FE will require greater levels of digital literacy to meet the learning needs of their students, including sector specific digital skills
- ICT skills and basic digital literacy are prerequisites within the Digital Teaching Professional Framework for FE (ETF)
- there is a high level of consensus on what the core components of professional development to support online and blended teaching approaches should be.

5.1 PD opportunities for online and blended delivery

Holt (2019), in her doctoral study of the changing role of teachers in FE colleges in England, identifies the challenge for colleges to support staff to upskill in their industry specialism as well as their PD in digital teaching and learning technology. The move towards new qualification routes, such as T Levels, also require sector specific digital skills and adds another layer of complexity for teachers' PD in FE. One of the key components of professional development identified within the research literature reviewed below, is allowing teachers opportunities to experiment with technology in a supportive environment and having time to do this. Holt (2019) suggests this is essential for FE: "Allowing teachers time to experiment with digital teaching and learning technologies is often limited by financial constraints for FE colleges but this requirement is becoming essential for the future of FE" (p.144).

ETF's Digital Teaching Professional Framework (nd) is a competency framework for teaching and training practitioners in the FE and Training sector. It was developed by ETF with Jisc, to focus on effective pedagogy and technology enhanced learning. Although the framework includes reference to ICT skills and basic digital fluency, these are considered a prerequisite for the use of digital technology for teaching, learning and assessment. The framework is mapped to European Framework for the Digital Competence of Educators (DigCompEdu), ETF's Foundation Professional Standards and to Jisc's Digital capabilities framework (Taking Learning to the Next Level, ETF).

The Enhance Digital Teaching Platform (EDTP) hosted by ETF, offers access to synchronous and asynchronous training, such as: webinars; courses on the use of technology to support pedagogy and assessment (for example, video editing, creating online quizzes); digital pedagogies for English and maths; engaging learners online; and differentiation. There is an online forum to support a digital community. The literature suggests that the impact of the training on teachers' practice is influenced by a wide range of factors, not just availability of training. This is discussed below.

The Digital Teaching Professional Framework, references the "substitution, augmentation, modification and redefinition" (SAMR) model (Puentedura, 2010) to identify the level of technology use in teaching and gives examples for technology enhanced learning. The SAMR model and the TPACK framework (Mishra and Koehler, 2006) are both cited in the literature and offer different approaches to considering learning design for PD which incorporates technology.

As discussed earlier (see section 2.5.2 and Figure 1), the TPACK model (Mishra and Koehler, 2006) identifies three primary forms of knowledge: Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK), which teachers need to be able to integrate for successful technology-based learning. The focus is on the synergy between technology and pedagogy.

The SAMR model (Puentedura, 2010) recognises what could be considered two levels of technology use in teaching and learning: **Enhancement** (teaching tool substitution or improvement using technology); and **Transformation** (redesign and creation of new teaching and learning activities). These models, together with ETF's competency framework for digital practitioners, can be used to consider and frame the intention of, and aspiration for, the use of technology in teaching and learning in FE. The TPACK and SAMR models are considered further below in the review of empirical research found in the literature. They also identify the change in pedagogy potentially needed for a pivot towards greater use of technology in FE teaching and learning.

The research reviewed largely focuses on the effectiveness of different approaches to PD in practice, the barriers and motivators, and the outcomes and impact of the PD on teaching practice (pedagogy) and student learning.

5.1.1 Overarching approaches to PD

PD at its broadest level can be categorised as supporting teachers to:

- learn about (technology)/ learn with (pedagogy): develop their own knowledge of, and competency in, digital literacy/skills; learning using digital media (such as online professional development)

- teach about (technology)/ teach with (pedagogy): support students' knowledge and use of digital literacy/skills; developing digitally enhanced/transformed teaching and learning using technology.

The literature covers the following themes:

- Impact on professional identity – a focus on values and attitudes of teachers as well as auditing digital skills
- Digital pedagogies; subject pedagogies and design fit
- Teacher confidence
- Teacher perspective of external and internal barriers to digital approaches
- Nurturing and encouraging investigation and curiosity
- Reflective practice and action research activity
- Learning by doing – within initial teacher education and CPD for in-service teachers
- Managing the change process – the role of education leadership and change agents, and ethos within the education system and individual organisations
- Resource implications.

The literature suggests that the transition from face-to-face teaching to an online teaching experience is more than just putting elements of learning online for teachers. It influences how teachers see their role, their professional identity, their beliefs and assumptions about teaching. A move towards a blended learning approach in an organisation will require a teacher learning strategy that addresses institutional support and the attitudes and motivations of teachers.

5.2 Key components of PD for teachers

Philipsen et al. (2019) reviewed 15 qualitative studies to identify the key components of PD strategies on how to teach in online or blended learning environments. The studies included a range of strategies and goals; for example, building understanding and competency in designing and/or pedagogy for online/blended learning, with training synchronous and asynchronous – sometimes with opportunities for collaboration. Components for PD to support online and blended learning based on the studies reviewed, include:

- **The design of a supportive programme and environment:** Teacher development for online and blended should be designed and developed to ensure teachers are supported throughout the process, both regular and just-in-time support and feedback. From 11 of the 15 studies, Philipsen et al (2019) identified the importance of support from an educational technologist or other expert within

the field. Four of the 15 studies identified the role of feedback to PD participants as important for the development of pedagogy. Consideration of the time needed for training was mentioned in 11 out of the 15 studies. This was two-fold. The perception that there was not enough time to undertake training and sometimes the idea that training was rushed. Teachers overall were considered to prefer a longer PD trajectory – with greater sensitivity around the academic calendar. Institutional planning for the CPD was cited as an important factor – **aligning training with the organisational context** and **recognition of the pivotal role of teachers' changing professional identity**, and **relevance of the training and transfer to practice.**

- The importance of a focus on technological, pedagogical and content specific knowledge – with the TPACK approach to professional development cited. **Acknowledging strategies for PD** included teacher reflection – often associated with self-assessment; active learning with the creation of a "product" at the end of the training; experiencing possibilities and real-life application; and developing confidence in teaching in an online environment. Peer support during the professional development, creating a community for teachers, sharing work, and collaborating, enables learning and builds confidence in teachers to become critical friends for one another. **Dissemination and opportunities to continue to engage with others** and evaluate outcomes are also important factors in developing teacher expertise in using digital technologies.

- Recognition of the professional identity of teachers is an important factor; as is making the link to enhancing student learning – PD should always **make clear the rationale for training and the value of the learning outcomes**.

Bennett (2014) suggests that macro level strategies, where the focus of PD is on technically literate and innovative staff, do not drive adoption of teaching and learning practices. Micro level strategies, focusing on attitudes and beliefs may be more useful in understanding engagement with technology in teaching practice in FE (Armstrong, 2019). The research outcomes from Armstrong's (2019) study on PD for technology-enhanced learning within a large FE college, suggest key themes that reflect the wider literature on the potential enablers and drivers to teacher engagement with technology in their teaching:

- perceived value of technology to support effective teaching

- barriers such as infrastructure, time, technical expertise, funding and capacity to develop coping strategies to overcome these challenges

- levels of confidence, attitudes towards risk and openness to change

- the impact of peer support, agents of change and access to wider networks of ideas and communities of practice (Armstrong, 2019).

Similar to the outcomes of Philipsen, et al.'s (2019) review, Armstrong (2019) identifies the need for teachers to have a safe environment to experiment and develop their confidence and their professional identity as they explore the use of technology in their teaching practice.

Glover et al (2016) use a collaborative, pedagogy-focused, project-based approach in their development of a Teaching Approaches Menu for teachers at Sheffield Hallam University to support them in increasing the use of technology enhanced learning in their practice. As in the other studies, a supportive environment, with opportunities to experiment, and to put pedagogy and the student experience at the heart of innovation, were important factors for successful teacher development. Drawing on the SAMR model (2010), Glover et al. (2016), argue that the impact of innovation and transformation is often limited by culture, resistance to change, inertia and funding issues within organisations, and a lack of support from management. Their project "grounded" the processes and resources developed in the "practical" and was locally focused, to avoid teachers feeling that this was an initiative being imposed from an external source.

The project team identified three elements as essential for the project:

- examples of practice needed to be locally focused
- development should be consultative
- resources needed to be non-prescriptive (Glover et al., 2016).

When the menu had been developed further, resources such as case studies were developed to support teachers to make decisions about the relevance of an approach for their practice. The approach to PD was also considered to have been successful as staff maintained "ownership" of their action plans, but shared them with facilitators and technology enhanced learning specialists, and with colleagues in a series of workshops, as part of the development of the "menu".

Further important factors identified by Glover et al. (2016), resonate with the components of PD discussed above, such as the support of senior staff, the focus on pedagogy and context, encouraging opportunities for discussion and sharing, consideration of how PD workshops are embedded into current institutional practice. The project team also reported the importance of ensuring that resources and workshops were needs focused, rather than generic one-size-fits-all, adapting to the participants attending each session – and avoiding jargon, technical or pedagogical to keep everyone engaged.

Seufert and Scheffler (2016), in their year-long project with a vocational school in Switzerland, focused on the development of information literacy within the school curriculum and a model of PD for teachers, which included both informal and formal learning. They also identified the fostering of a school culture of learning together and from one another, as an important component of a PD model to increase the use of technology enhanced learning. Their focus on a process-model of PD rather than what they see as a product-focused model, such as TPACK, requires a fluid approach, moving away from one-off training sessions to a model of continuous development; and importantly for vocational education, maintaining currency with technology use in the workplace.

The common themes of investigation, reflection and constructive dialogue, were also identified in Prestridge and Tondeur's (2015) study of online PD for technology enhanced learning in the secondary school classroom. The use of an action-learning model meant teachers' individual projects became part of what they were doing in their classrooms rather than an add-on exercise. Reflection, through the writing of a blog, was enhanced by the support of a mentor to probe, through discussion, teachers' reflections. Constructive dialogue with others was seen by the teachers involved as a very important component of the professional development – opportunities to question, give and receive feedback – both collegial and critical discourse, and the mentor's affective role, supported an online community. Critical discussion and a cognitive mentoring role were considered key to engagement in an online professional development environment (Prestridge and Tondeur, 2015).

5.3 Identifying need

Jisc's recent survey of teaching staff in UK-based FE colleges, had responses from 2,685 teachers across 26 different colleges, between October 2019 and July 2020. They reported that the most consistent demand from teaching staff was for CPD tailored to their teaching needs and for time to develop and practise these skills. Basic IT skills on their own are not enough. There are many facets to consider (pedagogical; accessibility; logistical; environmental; access to devices, platforms and services; interactions and engagement; etc) as well as specialist software for many subjects (Jisc, 2020b).

Jisc reported that while just over two-thirds of the survey respondents said they received support to develop basic IT skills, less said they received support from their organisation to develop specific digital skills or guidance about digital skills. For example, just over a third felt they had received guidance about the digital skills needed for their job and just under a quarter reported having time to explore new digital tools and approaches (Jisc, 2020b). Jisc suggest that whilst it is encouraging that the survey outcomes identify that digital skills development is discussed with colleagues and managers, this could be formalised to provide a framework for recruitment, induction and appraisal and become part of an entitlement for PD (Jisc, 2020b).

When asked what their organisation could do to help them to develop their digital skills, from a sample of 400 of the 1,654 responses to the survey, nearly half of teaching staff asked for more training. Slightly less than a third requested time to develop and practise skills, and to develop more digital resources (Jisc, 2020b)

Ofsted (2020) suggested the varying competence and confidence of staff with information technology has affected providers' success in making the transition to online learning. Staff training has been crucial.

> "Compared with the school sector, CPD opportunities more generally in FE are few and access is made difficult by lack of funding, the sessional nature of the work, and there being less of a tradition of inter-institutional collaborative networks to share good practice than there is in schools. The literature suggests that, for those teachers that do participate in CPD, it can take many forms, from the formal to the informal." *(Greatbatch, et al., 2018*)

5.4 Assessment focused training and professional development opportunities

“In the most effective provision, staff use a wide range of assessment methods, including computers and digital media such as cameras and recorders, very effectively” (Ofsted, 2014). However, the review found very little evidence in the literature of training / CPD specifically focused on issues to do with online assessment. There is some indication that where it exists it is provided by commercial organisations or awarding bodies.

5.5 Conclusions

- **The literature suggests that the transition from face-to-face teaching to an online teaching experience involved far more for teachers than just putting elements of learning online.** It influences how teachers see their role, their professional identity, their beliefs and assumptions about teaching. Peer support, creating a community, sharing work and collaborating, enables learning and builds confidence. These wider considerations need to be reflected in the training and development provided.

- **There is a high-level of consensus within the literature on the key components of effective professional development for digitally enhanced learning practitioners.**

- **A large majority of the teachers surveyed by Jisc reported that they received good support from their organisations to develop basic IT skills (Jisc 2020b).** Fewer, however, felt they had received guidance about the specific digital skills needed for their job or reported having time to explore new digital tools and approaches.

- **The review found little evidence in the literature of training / CPD specifically focused on issues to do with online assessment.** There is some indication that where it exists it is provided by commercial organisations or awarding bodies.

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