



Blended Learning for STEM at Levels 3-6 during the Covid-19 Pandemic and its implications for pedagogy and skills

This research project with Leeds College of Building and York College is focused on reviewing the student experience of blended learning during the lockdown periods. The research explores STEM subjects, which do not traditionally lend themselves to blended learning due to the significant practical elements required of students.

The research identified that a staff-based intervention could be used to support the progression of Level 3-6 STEM students into the workplace using blended learning. This extract from the research report provides some more detailed suggestions of the indicative content that could form the basis for each of the individual modules/sessions.

Table 12.1: Indicative content for staff blended learning modules

No.	Module Name	Indicative content of the modules
1	Buying into blended learning	<ul style="list-style-type: none"> • Exploring the myths and realities of blended learning • Tutor roles in creating and enabling supporting blended learning environments
2	Overcoming barriers	<ul style="list-style-type: none"> • Impacts identified during Covid-19 (overview of existing research including this report) • Incorporating flexibility (How blended learning could be more student-led or flexible, the role of independent space, and how knowledge can be better retained between sessions, courses, and years). • Stimulating interaction (Enabling spontaneity, facilitating relationships with and between students, the role of activities and breakout rooms, and the importance of questioning). • Facilitating students' learning processes and fostering an effective learning climate (The tutor's role in blended learning, bringing openness and supportiveness online, maximising the benefits of online and offline spaces, the learning environment, motivation, and personalisation, maintaining pastoral care and social engagement)
3	Communities of inquiry	<ul style="list-style-type: none"> • Theory and background • Teaching presence (interaction with clear goals and direction) • Cognitive presence (students actively learning) • Social presence (student engagement with each other) • Social-Cognitive Interactions (supporting discourse) • Social-Teaching Interactions (setting climate) • Cognitive-Teaching Interactions (regulating learning) • Analysing the strengths and weaknesses of blended learning (desirable and undesirable blends)
4	Developing a consistent approach to VLE	<ul style="list-style-type: none"> • Consistent application of LMS and VLE software (ensuring that all tutors use the same systems) • Consistent delivery via LMS and VLE (setting agreed principles for usage such as the length of sessions and use of recordings) • Consistent access to tutors (so that students are clear about when and how to access one-to-one support from tutors)
5	Making the most of MS Teams	<ul style="list-style-type: none"> • Overview of key features • Managing groups and files
6	Making the most of Moodle	<ul style="list-style-type: none"> • Using specific tools and functions (would be bespoke to the group/software but could include tools like MS Forms) • Embedding educational technologies (see also session 11)

7	Communication, Openness and Supportiveness	<ul style="list-style-type: none"> • Creating safe, open, and supportive learning environments • Promoting openness through positive role models • An open door isn't the same as being on call 24/7...
8	Flipped Classrooms for FE and HE	<ul style="list-style-type: none"> • Theory of flipped learning and flipped classrooms • To flip or not to flip • Advantages and disadvantages • Dealing supportively with students who don't engage
9	Should we still record our sessions?	<ul style="list-style-type: none"> • Exploring the advantages and disadvantages of recording sessions • What do students gain from recordings? • Exploring alternatives (e.g., pre-recorded revision material)
10	Flexible teaching, learning and assessment	<ul style="list-style-type: none"> • What flexibility means • Who is flexibility for? • How flexible teaching, learning and assessment could work • Why adopt a flexible approach? • Evaluation
11	Embedding Educational Technologies	<ul style="list-style-type: none"> • Overview of relevant educational technologies • How to embed these into existing teaching, learning and assessment
12	Microsoft Educator	<ul style="list-style-type: none"> • Overview of the Microsoft Educator Programme • Registration • Suggested sessions to try
13	Student motivation and isolation	<ul style="list-style-type: none"> • Fostering an effective learning climate <ul style="list-style-type: none"> ○ Providing and nurturing safe spaces ○ Providing communities for learning • The importance of enrichment on the rest of the curriculum • Student self-discipline, resilience, and work-life balance
14	Interaction and active learning in theory lessons	<ul style="list-style-type: none"> • The value of active learning in theory lessons • Helping students to understand the bigger picture (why am I doing this?) • Breaking the ice: how to overcome students' reluctance to get involved (particularly online)

15	Student-led blended learning	<ul style="list-style-type: none"> • How can blended learning promote student enquiry and curiosity? • Why flexible approaches to blended learning (e.g., Open University) work well for some students and not others • Embedding flexibility in your own teaching
16	Developing students' ICT skills	<ul style="list-style-type: none"> • Developing students' ICT skills for academic study and professional writing • Developing independent learning and critical thinking skills • Evaluating the specific needs of your students (e.g., software tutorials or refresher courses in engineering mathematics)
17	Creating self-study tutorials for key software packages	<ul style="list-style-type: none"> • How self-study tutorials can complement in-class teaching, learning and assessment • Existing vs. bespoke tutorials • Identifying key packages (e.g., AutoCAD, Revit) • Ensuring students can access software and files • Tutor support
18	Educators as content creators	<ul style="list-style-type: none"> • Experimenting with social media and video • Potential tools and approaches • Keeping it brief and engaging • Video editing for beginners
19	Embedding blended learning into curriculum modelling	<ul style="list-style-type: none"> • Evaluation of existing approach to curriculum modelling • Intent, Implementation, Impact • Curriculum models: product, process, and praxis • Using a praxis model to embed blended learning
20	Reflective practice and student feedback	<ul style="list-style-type: none"> • Introduction to the reflective practice framework • Involving students in reflective practice • Critical reflection of assumptions • Critical reflection of knowledge • Critical reflection of experiences

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