Evaluating the Impact of Implementing Learning Design Approaches in STEM over 4 Years (July 2017 – July 2021)

Introduction

In 2016, the OU was restructured into four super-faculties (STEM, WELS, FASS & FBL). Amongst many other things, each faculty was tasked with developing structures, governance and procedures that would support module teams in designing teaching and learning appropriate to their context. STEM was assisted in this by the outputs of the OU Learning Design Initiative (OULDI), the piloting work of the Learning Design Project in the Institute of Educational Technology (IET), the permanent formation of the Learning Design team in Learner Support Services (LDS-LD), and the extensive design for learning experience and practice that was already in place in the Maths, Computing & Technology (Kantirou, 2016) and Science Faculties.

However, to date, little work has been done either within faculties or in the wider sector to measure the impact of the implementation of learning design and the arrangements that have evolved to support learning design practice. Agostinho et al (2018) interviewed 30 university teachers about the kinds of support they accessed to help them with their learning design work. They found a wide variety of sources which included, colleagues, literature, workshops, seminars, conferences and institutional support services but concluded more effort needed to be made to understand how these supported learning design practice (Agostinho, Lockyer & Bennett, 2018). A literature review looking at the adoption of learning design tools and methods found that whilst there had been a focus on the usability of specific tools there was a lack of studies that investigated barriers to adoption such as institutional support (Dangino et al, 2018).

This eSTEeM project seeks to document and evaluate the impact of the incremental implementation of learning design in STEM over the period of 4 years (July 2017 – July 2021). This report contains a description of what it means to 'do' learning design in STEM, the findings from four interrelated research questions and the identification of four recommendations for future practice which are centred around (i) time, (ii) contextualisation, (iii) experience, and (iv) a re-orientation of learning design.

What does it mean to 'do' learning design in STEM?

Whilst a widely recognized and accepted definition for learning design remains elusive, some useful concepts and frameworks exist that can be utilized to help explain the key features.

Orientating 'learning design' can be problematic because the term has evolved to describe it occupying at least three distinct roles which in turn affect the way it is perceived by different stakeholders (Godsk, 2017). These roles include considering 'learning design' as:

(i) A product, that is: 'A' learning design – a plan or recorded sequence of teaching and learning activities.
(ii) A process, that is: One or more events or stages that are attended or completed to assist in the development of a piece of teaching and learning.
(iii) A practice, that is: The action of applying Learning Design concepts to the creation and implementation of a piece of teaching and learning.

Before an evaluation on the implementation of learning design in STEM could take place, the first step was to describe it's particular orientation at the OU. At an institutional level the OULDI sought to establish this between 2007 and 2012. It drew on many wide-ranging interviews with staff as part of the *Institutional Approaches to Curriculum Design and Delivery* programme which was co-funded by the Joint Information Systems Committee (JISC) and the European Union (EU) (Conole & Wills, 2013). The OULDI pilots led to the integration of the recommended approaches into the Stage-gate approvals and governance process. The orientation of learning design was, '…designed to further promote creativity and innovation, and introduce a consistent, structured design, specification and review process to support the new approvals process' (Galley, 2015: 5).

The learning design model recommended by OULDI aimed to embed design approaches that were student- focused and characterised by three principles:

(i) mechanisms to encourage design conversations across disciplines and expert roles
(ii the use of tools and instruments as a means of describing and sharing designs
(iii). the use of information and data to inform the conceptual tools and frameworks that guide the decision-making process (Galley, 2015: 6)

The *Larnaca Declaration on Learning Design* established three conceptual approaches that taken together '…provide a foundation for the field of learning design' (Dalziel et al, 2016: 21). These concepts, and their relationships with one another, are outlined in figure 1:

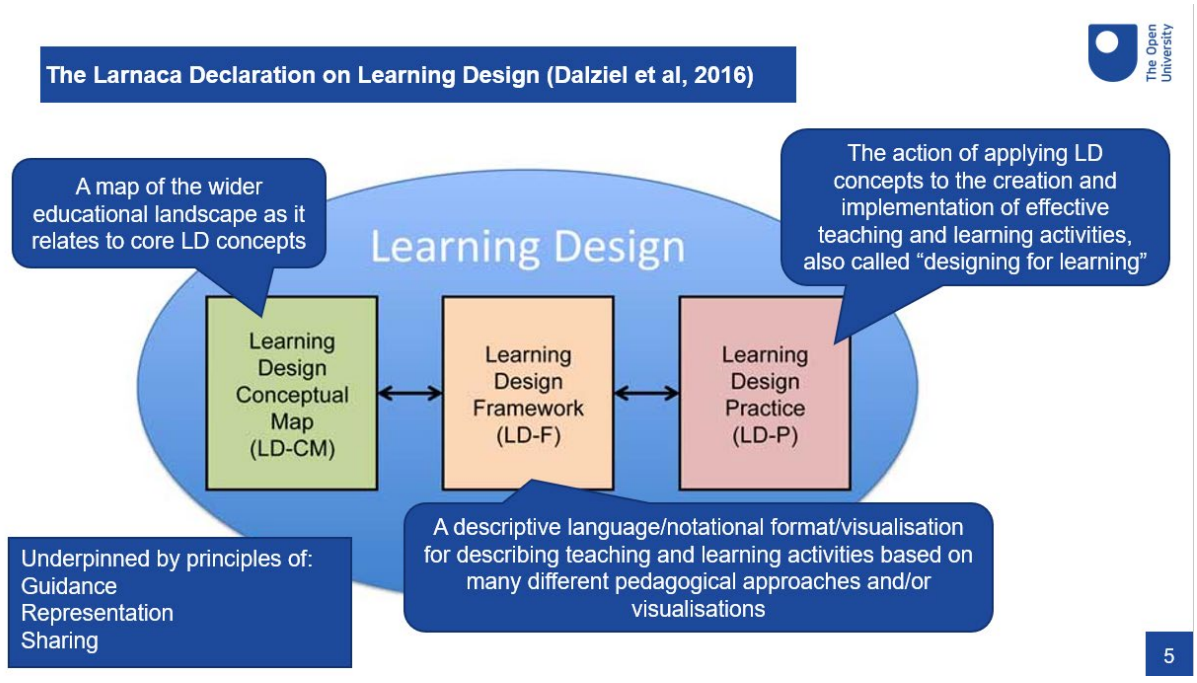

Figure 1: Dalziel et al (2016) conceptual approaches for Learning Design

The following section describes some of the outputs of the OULDI and considers their relation to these conceptual approaches.

The central concept of a Learning Design Framework (LD-F) is based on the idea that educators should be able to share good examples of practice in learning and teaching, much like a musical notation system. Like learning and teaching, musical representations can't capture everything about music – the 'performance' is still essential – but by writing down music great works of art can be shared and valued across cultures and time (Dalziel et al, 2016). At the OU this notation system is represented by the Activity Types Classification Framework (Conole, 2012). This framework encourages learning to be divided into 7 student focused categories (figure 2) to which time spent is then allocated at different levels of granularity to create shareable visualisations and learning design analytics. This is referred to as an 'Activity Planner' and is captured in an online Learning Design Tool (Olney, Rienties & Toetenel, 2019).

Assimilative (attending to information) - students study and think about theories and concepts encountered in materials and resources. *Read, Watch, Listen, Think about, Access, Observe, Review, Consider, Study*
Finding and Handling Information (searching for and processing information) - Students are actively and critically engaged in gathering and manipulating information. *List, Analyse, Collate, Plot, Find, Discover, Access, Use, Gather, Order, Classify, Select, Assess, Manipulate*
Communication (discussing theories and concepts with at least one other person. - Through dialogue, students begin to take a position in relation to problems and debate and internalise complex and interrelated concepts. *Communicate, Debate, Discuss, Argue, Share, Report, Collaborate, Present, Describe, Question.*
Productive (generating an artefact) - Students apply their knowledge and skills together or alone in order to create a piece of work. *Create, Build, Make, Design, Construct, Contribute, Complete, Produce, Write, Draw, Refine, Compose, Synthesise, Remix.*
Experiential (applying learning in a real-life setting) - This student activity is most often found in work based learning or practical science modules. *Practice, Apply, Mimic, Experience, Explore, Investigate, Perform, Engage.*
Interactive/Adaptive (applying learning in a simulated setting) - Students apply their knowledge and skills in a simulated setting, receive feedback and are then given the opportunity to adapt their approach. *Explore, Experiment, Trial, Improve, Model, Simulate.*
Assessment (assessing a student's learning) - Includes continuous, summative and formative types of assessment) *Write, Present, Report, Demonstrate, Critique, Peer-review, Self-assess*

Figure 2: The Activity Types Classification Framework categories

Outputs of OULDI that are reflected in the concept of a Learning Design Conceptual Map (LD-CM) can be found in the establishment of Compendium DL learning design mapping software

and the creation of the Module Map visualisation. Before the use of Compendium DL was discontinued in 2019 it allowed for module teams to electronically visualise the component parts of a piece of teaching and learning. The Module Map visualisation provides a way for module teams to document their discussions in four areas of the student experience: guidance and support, content and activities, reflection and demonstration, communication and collaboration.

In STEM, both the Activity Planner and the Module Map are required to be completed for the module approvals process. These outputs are included as appendixes to the primary document, the Module Specification Document. It is the Module Specification Document that bears the closest comprehensive resemblance to the LD-CM as laid out by Dalziel et al (2016). It contains details of proposals for (amongst other things): staffing, curriculum rationale, learning outcomes, registration requirements, student profiles, projected enrolments, external recognition, learning and teaching design, tuition, assessment strategies, delivery methods, accessibility and risk assessment. After approval, module teams continue to engage with the Activity Planner in order to create more granular visualisations of the student experience on a module as the design develops.

The OULDI piloted approaches to Learning Design Practice (LD-P) which required low levels of orchestration in the shape of a voluntary design community. Sharing examples of practice and having access to a network of other design orientated academics and learning designers was encouraged through the establishment of the Cloudworks website between 2009 and 2019. This early social networking was eventually archived as funding for it's maintenance was discontinued. More orchestrated approaches, typically in the shape of facilitated learning design workshops, were also piloted and continue to be a common feature of the OU learning design model.

Responsibility for learning design in STEM is located within the portfolio of the Associate Dean, Student Experience (AD-SE) and the Senior Manager, Learning & Teaching (SM-L&T). Once the Module Specification Document is approved at School level (Board of Study - BoS), Faculty level (Scrutiny Group - SG) and University level (Teaching Committee - TC) LDS resources are made available to support further learning design (which is led from LDS-LD) and the rest of production. This approval process is referred to as Stage 4: Module Specification and Production.

It is only this period, prior to module specification approval, that is in scope for this project.

Various learning design guidance, tools, activities, and mechanisms have been established within STEM to support module teams during this period:

1. The **Module Team Chair Induction Meeting** takes place between the Associate Dean, Student Experience, the Head of Curriculum Strategy & Governance, the Module Team Chair (MTC) and the Curriculum Manager (CM) once they are allocated to a module by their school. This staff development session is an informal meeting in which roles, responsibilities, processes and proposed ways of working are discussed. Innovative approaches are encouraged and supported.

2. The **Learning Design Workshop** (LDW) provides a focal mechanism for bringing together academics, curriculum managers, teaching managers, directors of teaching, employability specialists, and technical experts to design new modules. In STEM LDW are facilitated by the Senior Manager, Learning & Teaching (SM-L&T). Analysis of 28 LDWs is included in this study. The average time of the 28 LDW was 4.8 hours, with individual LDW varying in length from 2.5 hours to 7 hours. 25 LDW were face to face, 3 were online.

LDW agendas (tailored to the specific needs and context of the module team) are set by the SM-L&T, the MTC and the CM who meet 5-10 days before the LDW to do this. Due to this tailoring the inclusion of learning design activities is varied as shown in figure 3.

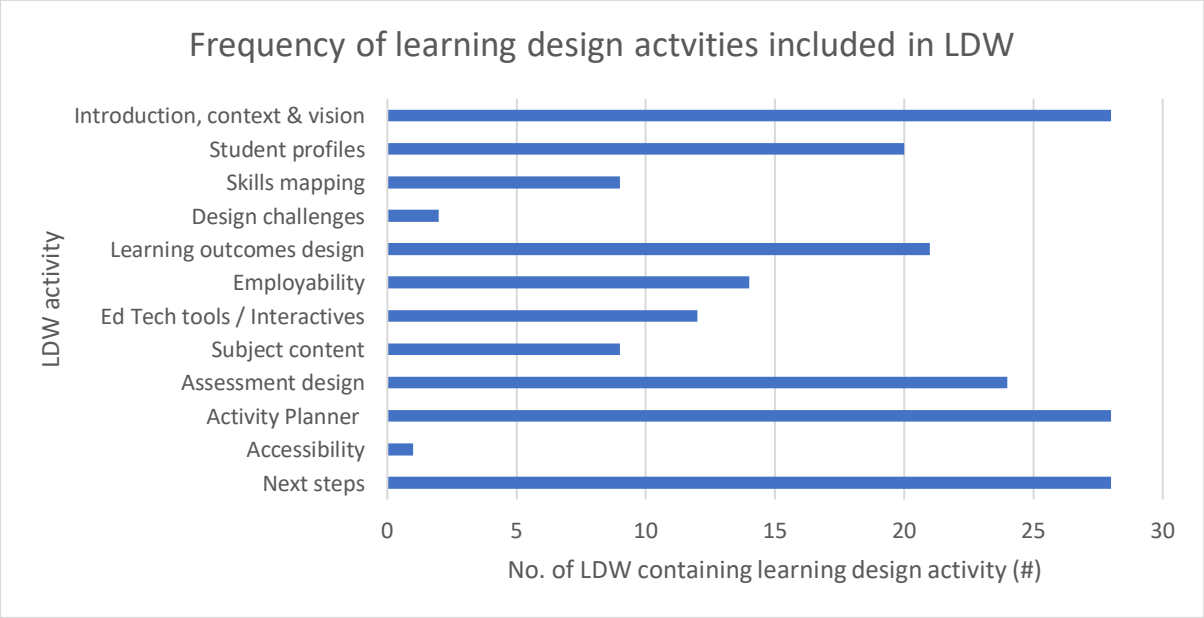

Figure 3: frequency of learning design activities at LDW

3. The **MTC Induction (Production) Guidance website** was created to support new academics and curriculum managers into their production role by providing a step-by-step journey through the early stages of production linking to key documents, websites and guidance. It is divided into the following topic areas:

- 00: Introduction
- 01: Getting Started as a Module Team Chair (Production)
- 02: Attending the Module Team Chair (Production) Induction meeting
- 03: Before the Learning Design Workshop – Getting the most from Learning Design
- 04: After the Learning Design Workshop – Establishing the Module Specification
- 05: Preparing a Diagnostic Tool
- 06: Understanding the Roles of staff in Learner & Discovery Services (LDS)
- 07: Receiving Support from the Deanery During Production
- 08: Creating an Online Module from your Design

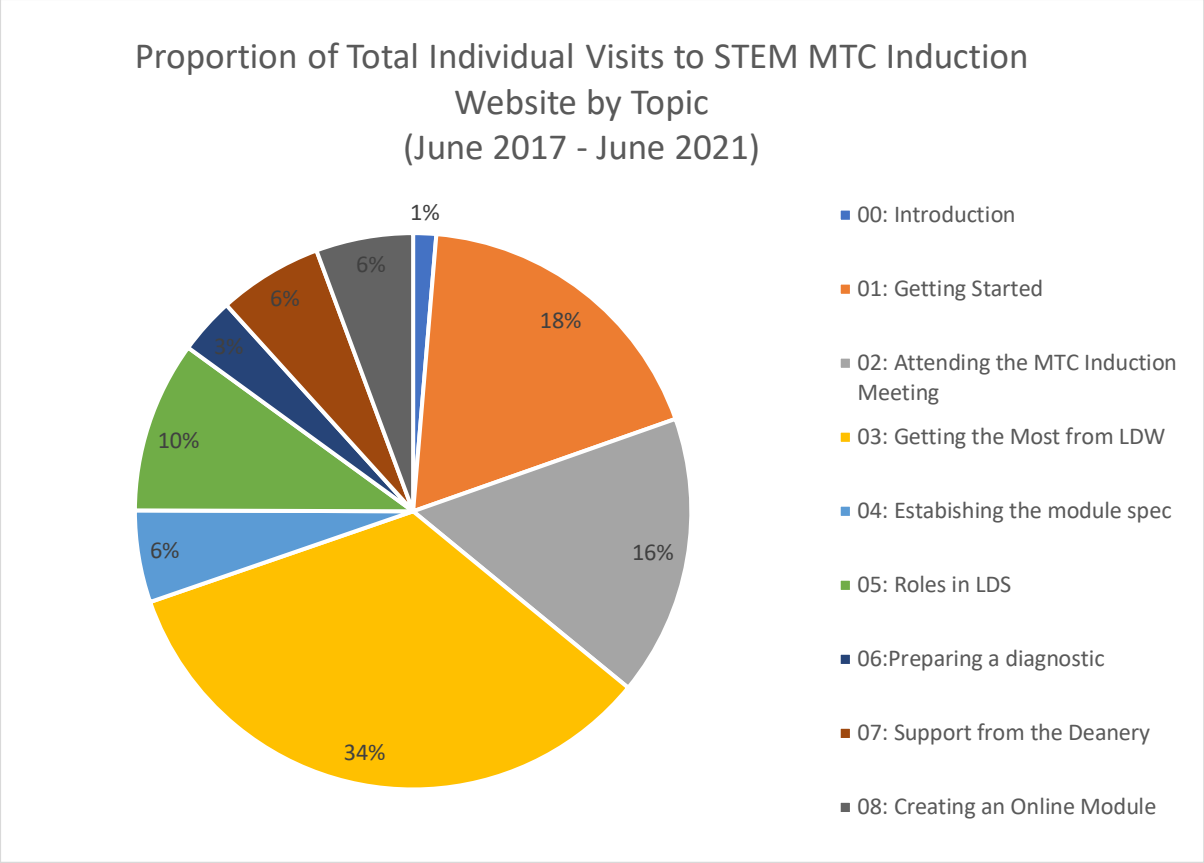

Figure 4: proportion of total individual visits to STEM MTC Induction Website by topic.

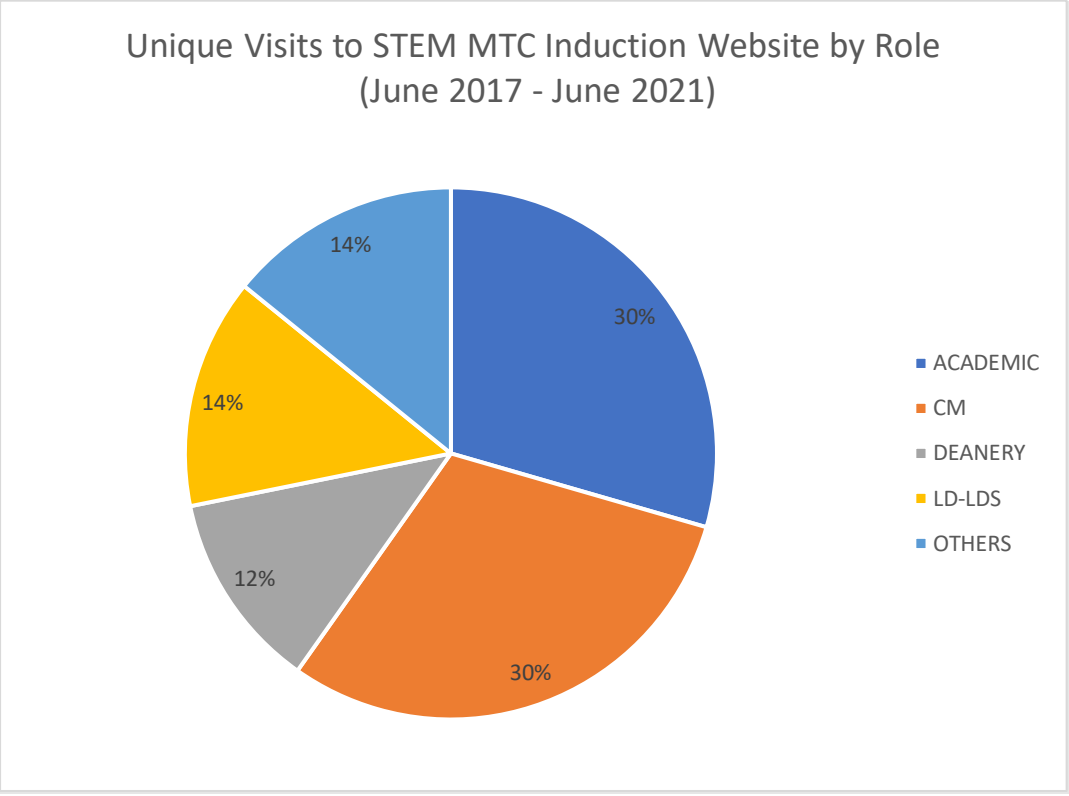

Figure 5: proportion of total unique visits to STEM MTC Induction Website by role

Figures 4 and 5 suggest that the main reason for visiting the STEM Induction website is in order to prepare for MTC Induction Meeting and the LDW provided as part of the support for learning design in STEM. The website seems to be accessed equally by CMs and academics.

4. **OU STEM specific exemplar guidance and reports** for developing:
   - The Module Specification Document
   - intended learning outcomes
   - assessment strategies
   - student workload norms
   - diagnostics
   - Activity Planners

Methodology

Three original research questions and associated hypotheses were created to guide the project:

RQ1: How has STEM learning design impacted on module teams design practice, their collaborative ways of working and their perceptions of effectiveness?
Hypothesis: implementing and embedding LDW and other support mechanisms has led to improvements in collaborative ways of working and perceptions of effectiveness.

RQ2: How has STEM learning design impacted module design?
Hypothesis: implementing and embedding the Activity Types Classification Framework and the Student Workload Guidance has led to more student-focused learning designs being created.

RQ3: How has STEM learning design impacted on internal STEM module approval processes?
Hypothesis: implementing Learning Design has led to improvements in the quality of module specification documentation, the confidence of 'gatekeepers' and the efficiency of governance processes.

Prompted by a brief literature review and the resulting description of what it means to 'do' learning design in STEM, we decided to add a fourth research question utilising the Theory of Practice Architectures (TPA). This theory provides a means to establish, 'an account of what practices are composed of and how practices shape and are shaped by the arrangements with which they are enmeshed in a site of practice' and is, 'a basis for a contemporary theory of education appropriate for the modern world.' (Mahon, Kemmis, Francisco & Lloyd, 2017; 16)

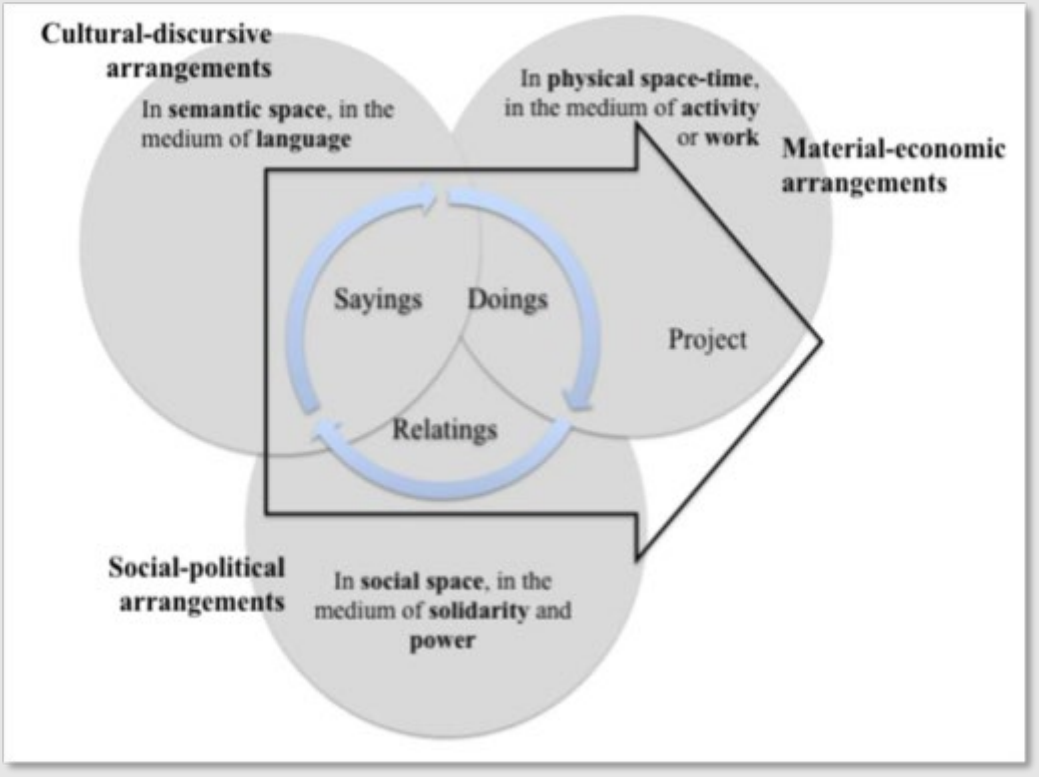

Figure 6: the Theory of Practice Architectures (TPA) (Mahon, Kemmis, Francisco & Lloyd, 2017)

A call for the application of this theoretical approach in documenting learning design practice in higher education and (crucially for our project) the structures and networks that support that practice, has been made as a way to prevent stagnation and provoke further debate about the direction of the field. Research projects that incorporate TPA could help to ensure institutional arrangements are transparent and versatile. For examples a group of leading learning design researchers have highlighted the danger that, 'if internal barriers to teacher design are not mitigated or removed, and enablers are not enhanced or introduced, there is little prospect that sustainable change will occur.' (Bennett, Lockyer & Agostinho 2018; 1021)

Despite this call from influential figures within the field of Learning Design we were unable to find any published work that had applied TPA to learning design practice in higher education. However, we were able to draw on examples of this approach in related fields such as Education for Sustainability (Kemmis & Mutton, 2011) and English language teaching (Edwards-Groves & Grootenboer, 2015) to give us confidence that we were contributing something new and potentially useful to learning design research.

Therefore, in line with these other examples, we developed a fourth research question:

RQ4: what cultural-discursive, material-economic and social-discursive arrangements enable and constrain the enactment of learning design practice in STEM?

The specific design, engagement with participants, analysis and findings related to each of these four RQs are outlined below.

Results

RQ1: How has STEM learning design impacted on module teams design practice, their collaborative ways of working and their perceptions of effectiveness?

Design

A survey instrument was created in MS Forms which was made up of seven positive statements about various 'components of STEM learning design'. Each statement was designed to draw on the principles established by OULDI and outlined by Galley (2015). Respondents were asked to indicate the extent to which they agreed with each statement on a Likert scale with four options. The statements were:

> *1. The MTC Induction meeting with the AD-Student Experience and Head of Curriculum, Strategy and Governance prepared me for my role and responsibilities during production.*
>
> *2. The STEM MTC Induction Guidance (Production) website (https://learn3.open.ac.uk/course/view.php?id=300862) assisted me in preparing for production and, when referred to, contained the information I needed to know.*
>
> *3. The agenda for the Learning Design Workshop provided an outline that met both the specific needs of the module team and also enabled participants to focus on the student experience.*
>
> *4. The Learning Design workshop was useful as an opportunity to be more effective and more collaborative in the process of designing a student focused module.*
>
> *5. The Learning Design workshop was useful as an opportunity to be more effective and more collaborative in the process of preparing the module specification (REP03) documentation for submission.*
>
> *6. Visualizing the proposed module using the Activity Planner was useful as a way to be more effective and more collaborative in the process of designing a student focused module.*
>
> *7. The visualization generated using the Activity Planner that was submitted with the REP03 will accurately reflect the student experience in the final module design.*

Plus, there was an open-ended question:

> *8. Please use the space below to make some comments about either the preparation for the Learning Design Workshop, or the workshop itself (for example, how appropriate the timing may have been). We are particularly interested in how these processes, or the event, may have contributed to your module development in ways not reflected by statements 3 or 4.*

Participants

A link to the survey instrument was sent to the MTC and CM of new modules which had received support from the STEM deanery and were required to submit a new module specification for approval. The survey was sent shortly after documentation had been approved at Scrutiny Group.

First module approved SG = July 2017

Last module approved SG = Mar 2021
Total modules = 28
Total surveys sent = 58 (CM = 28, MTC = 30)
Survey responses = 43 (CM = 21, MTC= 22)
Response rate = 74%

Analysis

The results for Q1-7 (Likert responses) were exported from MS Forms into MS Excel and numerical values were allocated, that is; disagree = 0, slightly agree = 1, mostly agree = 2, completely agree = 3. Therefore, the highest possible score for any possible response is 21.
The results for Q8 (Open-ended question) were exported from MS Forms into NVivo 12 for analysis and coded by the author

Findings

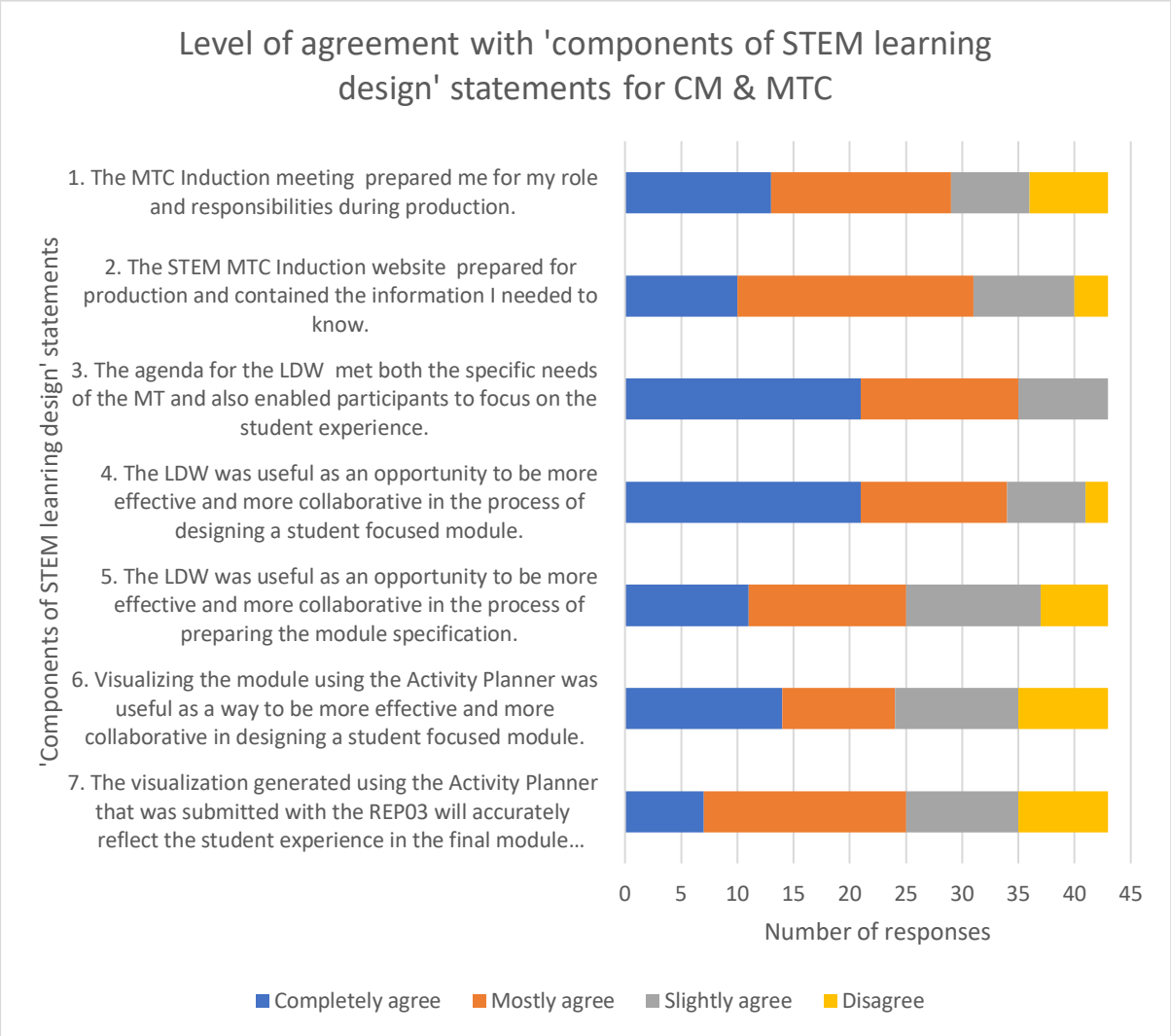

Figure 7: mean averaged levels of agreement with the 'components of STEM learning design' statements (43 responses)

The statements for which levels of agreement were highest, were statements 3 & 4.
The statements for which levels of disagreement were highest, were statements 1, 5, 6 & 7.

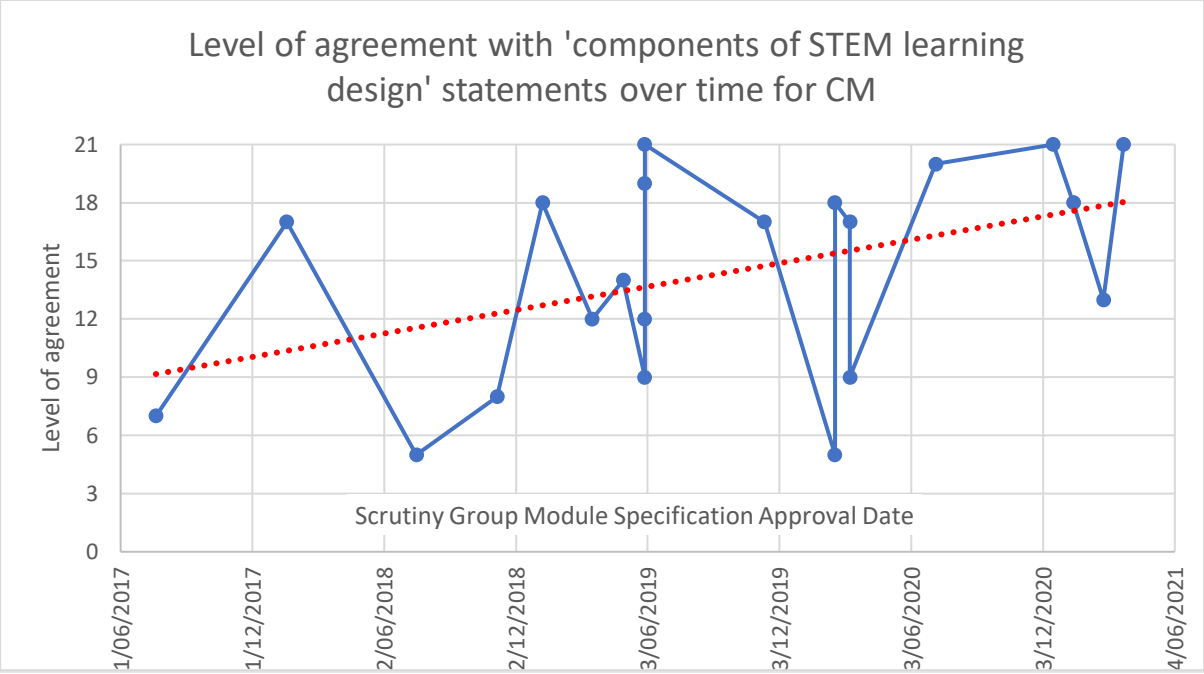

Figure 8: level of agreement with components of STEM learning design' statements over time by module specification approval date for curriculum managers (21 responses)

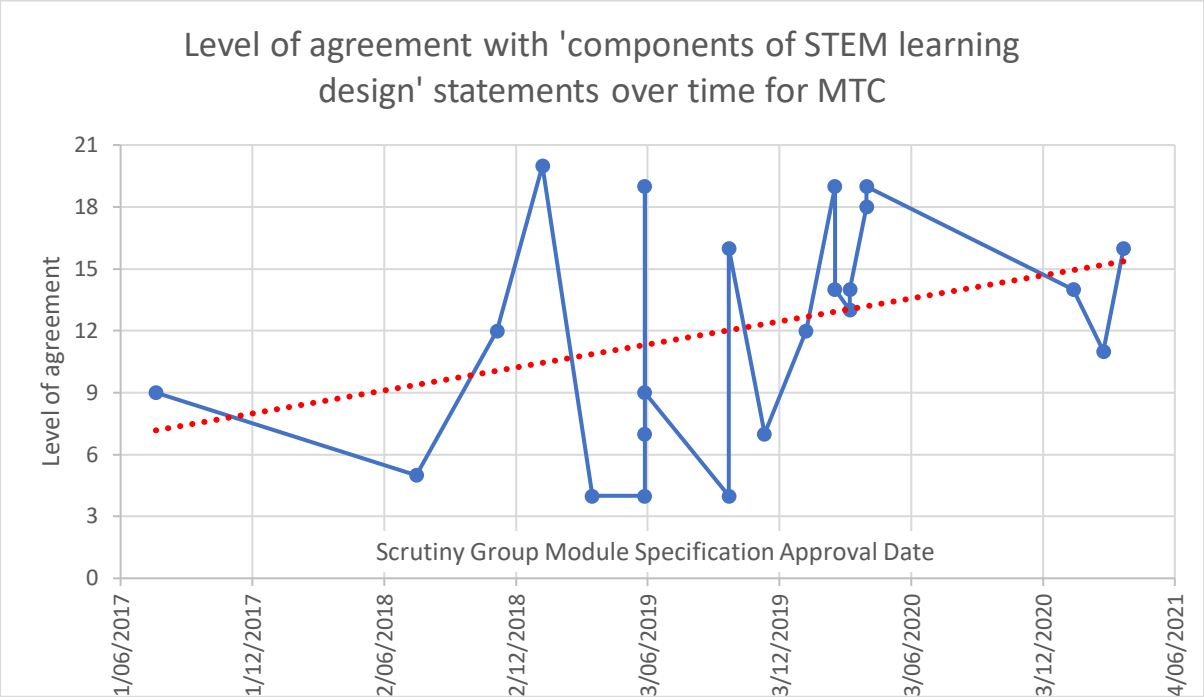

Figure 9: level of agreement with components of STEM learning design' statements over time by module specification approval date for academics (22 responses)

The trendline on figures 8 and 9 shows there has been increasing agreement with the seven 'components of STEM learning design' statements over time for both CM and MTC involved in STEM production modules in the last four years.

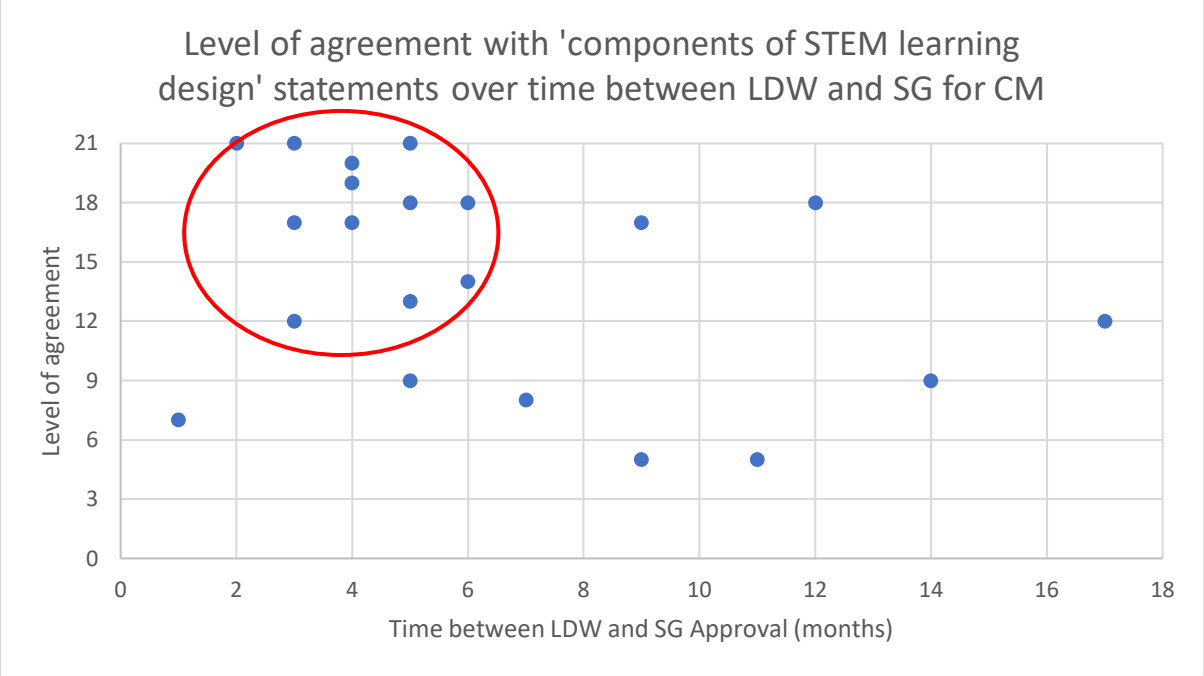

Figure 10: level of agreement with 'components of STEM learning design' statements over time between LDW and module specification approval for curriculum managers (21 responses)

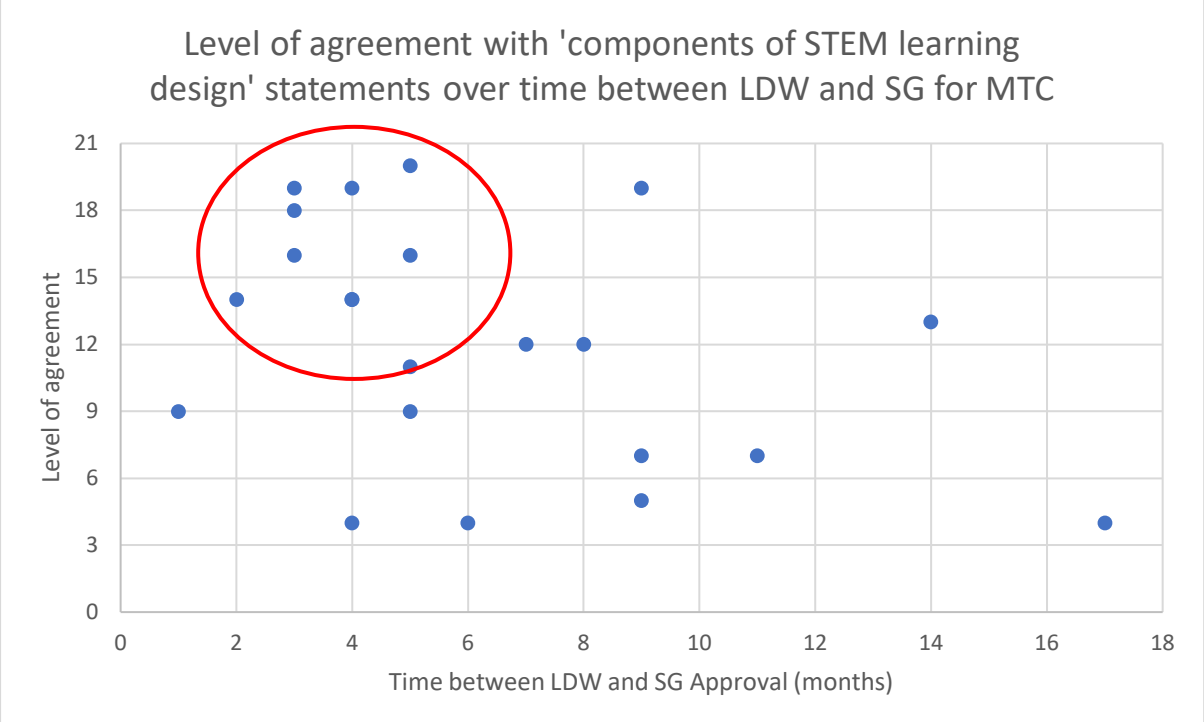

Figure 11: level of agreement with 'components of STEM learning design' statements over time between LDW and module specification approval for academics (22 responses)

Figures 10 and 11 show the relationship between agreement with the seven 'components of STEM learning design' statements and the time between LDW and SG for both CM and MTC.

18 of 21 respondents that had a level of agreement with the seven 'components of STEM learning design' statements ABOVE 14, also had their module approved at SG 2 to 6 months after the LDW took place.

However, 7 other respondents that were also approved at SG 2 to 6 months after the LDW had a level of agreement with the seven 'components of STEM learning design' statements BELOW 14.

Despite some outliers, the figures demonstrate a cluster of high level of agreement with the 'components of STEM learning design statements' when the LDW workshop takes place 2-6 months before SG.

RQ2: How has STEM learning design impacted module design?

Design

Part of the module specification to BoS and SG is a completed Activity Planner that visualises the design intention of the MT for their module in regards to the student workload and learning activities as classified by the Activity Types Classification Framework (figure 2). MT are required by the STEM deanery to submit Activity Planners that are presented using the online Learning Design Tool, however they can also be presented as a printed appendix in the form of a table. Fully completed Activity Planners generate a set of Learning Design Analytics that can be compared across modules

Participants

20 modules submitted completed Activity Planners that could be said to represent the design intention of the module team within the timescales. These 20 modules were given identifiers A-T. Partially completed Activity Planners were not included.

Analysis

Activity Type Classification data was downloaded from the online Learning Design Tool or extracted from module specification documentation. Comparison of the Activity Type distribution for the 20 modules was calculated. Mean averages for each Activity Type was calculated and compared against the mean averages from 151 OU modules (inc. STEM) published in 2015 (Rienties & Toetenel, 2015).

Findings

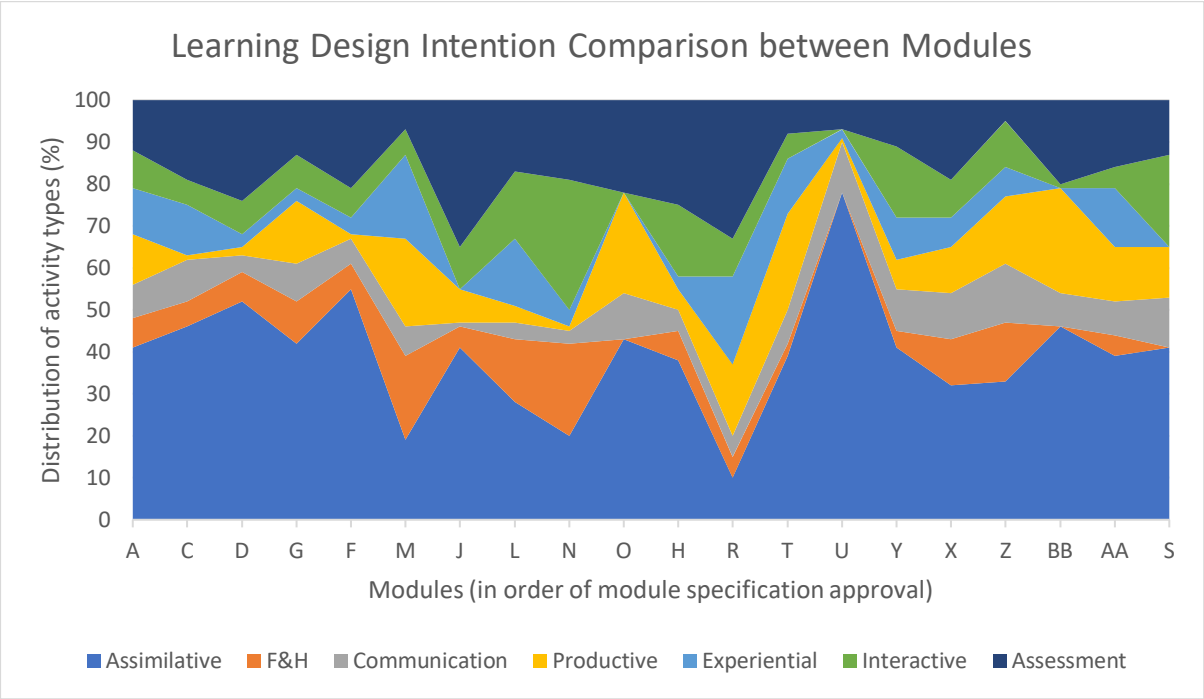

Figure 12: comparison of learning design intention between modules.

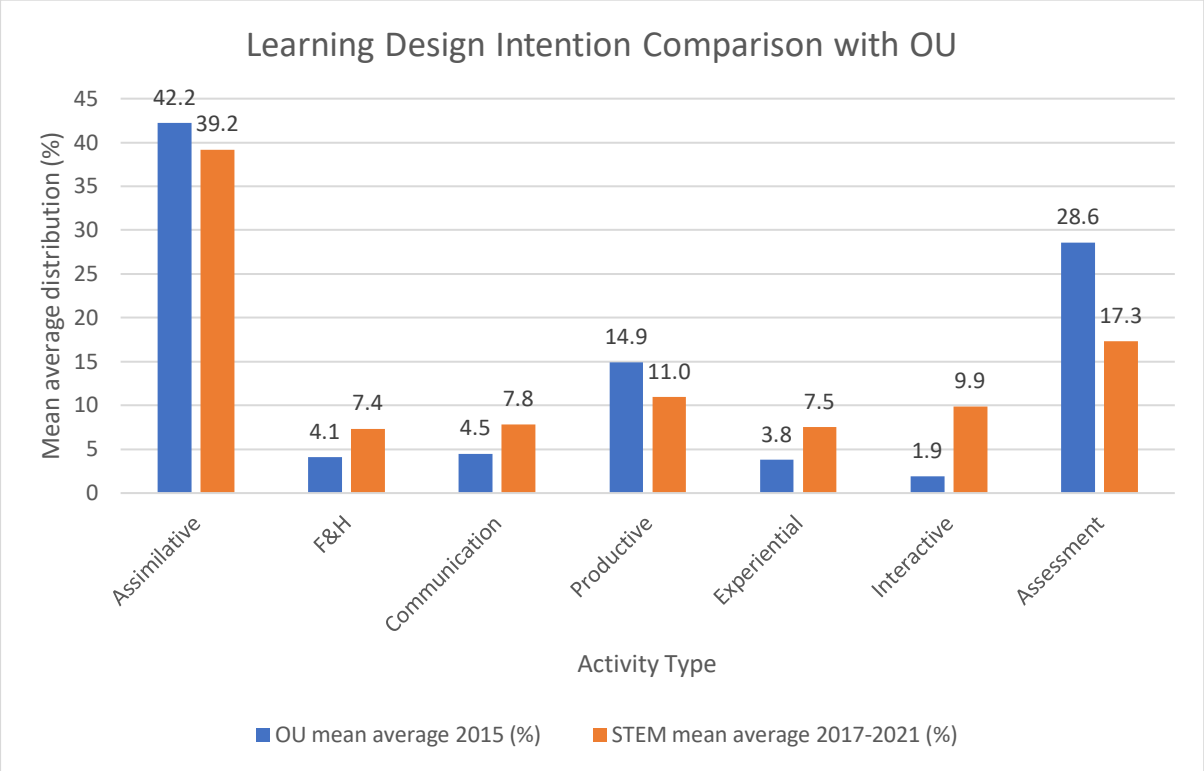

Figure 13: comparison of learning design intention between OU mean averages (2015) and STEM mean averages (2017-2021).

Figure 12 illustrates the variety of distribution of the intended design across the 20 STEM modules. For example, module L has very low % of assimilative content compared to module N. This is likely due to the nature of the content and subject matter. However, the design intention distribution does not appear to have significantly changed over the period of the study and no trends were observed.

Figure 13 shows that STEM mean averages (2017-2021) are lower for assimilative (-3.0%), productive (-3.9%) and assessment (-11.3%) categories than the OU mean averages (2015) but were higher for Finding & Handling Information (+3.3%), communication (+3.3%), experiential (+3.7%) and interactive/adaptive (+8.0%) categories than the OU mean averages (2015).

RQ3: How has STEM learning design impacted on internal STEM module approval processes?

Design

An interview instrument was collaboratively designed by the members of the project team based around the principles of quality, confidence and efficiencies in module specifications being approved over time (see appendix 1)

Participants

14 members of either Board of Studies (Academic 2, Professional 3) or Scrutiny Group (Academic 4, Professional 5) with years of experience ranging from 1-5 years were identified and interviewed by two members of the project team.

Analysis

Interviews were recorded in Teams, transcribed and imported into NVivo12 for coding and analysis by the members of the project team. Interviewees were anonymised and are referred to here by an identifying number in square brackets.

Findings

9 of the interviewees had previously attended a learning design workshop, either as an observer or in their role as an academic. When asked about their perceptions of learning design support several reported how some colleagues had described the process in negative ways such as ‘hurdles to get over’ [04], ‘what a waste of time, people come in here and tell me how to write a module, we know how to write a module’ [06] or hearing ‘moans and groans’ [09].

Interviewees generally struggled to find ways to articulate how learning design support may have specifically impacted on positive changes to module specification quality, confidence in module team’s readiness for production, or efficiencies of process. As one interviewee put it, ‘I wouldn’t necessarily be able to look at a spec and say oh you know I can see that got there because of those discussions in a learning design workshop. I might be able to, but I might not’ [04]. Also, most expressed difficulties in recalling details of module specifications from the past with anything like the required accuracy to be confident about commenting.

The experience of the module team, rather than learning design support, emerged as an important factor for the interviewees in evaluating the process of reviewing and approving module specifications [02] [05] [06] [09] [10] [11] [14]. Several interviewees also referenced other complexities, such as: the timescales module teams were working within, or the staffing resources available to module teams, or the specific context of the module they were designing, that didn't allow them to compare circumstances and isolate learning design.

Nevertheless, when pushed to assign values or asked directly about their perceptions of change over their time approving module specifications, the analysis found that as a result of learning design in STEM the interviewees responses can be summarised thus:

Perception of change to quality of spec:
Quality declined = 0 interviewees
No change to quality = 9 interviewees
Quality improved = 5 interviewees [02] [03] [09] [10] [12]

Perception of change in confidence that MTs ready for production:
Less confident =3 [12] [13] [14]
No change = 5
More confident = 6 [01] [02] [03] [09] [10] [11]

Perception of change to efficiency of process:
Less efficient = 0
No change = 9
Improved = 3 [09] [10] [11]

5 interviewees saw improvements in at least 2 of the three areas of quality, confidence & efficiencies they were asked about [02] [03] [09] [10] [11]. 4 of these were professional (rather than academic) and had also observed a LDW. The reasons given for less confidence now than before were to do with increased expectations around the use of technology [12] and compressed timelines and tighter deadlines [13] [14] rather than learning design.

Many positive comments and areas of impact associated with the learning design support provided were identified by the interviewees. These included reducing student workload [02] [12], learning outcomes [08] [14], developing a coherent rationale [05] and thinking about what the student experience would be, irrespective of the content [03] [05] [08] [10] [11] [12]. Interviewees explained they perceived the value of the support was in being able to 'ringfence' or 'protect' time [08] [10] in order to have 'a very productive conversation' [02] about elements of the student experience that were not content driven but needed to be 'directly questioned' [12], 'challenged' [10] or addressed [06] as a 'step in the process' [07]. One interviewee highlighted how they felt they were now, 'less in the position of signing a blank cheque of approving a module where there are lots of unknowns' [03] whilst for another learning design support, 'meant that they [the academics] just had a clearer idea about what they were going to produce' [09]. Despite 5 of the interviewees having never attended a LDW their perceptions of the activities that took place there were broadly accurate, specifically

referencing the development of learning outcomes [01] [05] assessment strategies [01] and 'how to teach' [13] as being amongst the expected activities.

RQ4: what cultural-discursive, material-economic and social-discursive arrangements enable and constrain the enactment of learning design practice in STEM?

Design

In line with the approaches to using TPA taken by Kemmis & Mutton (2011) and Edwards-Groves & Grootenboer (2015) we adopted a mixed methods approach to gathering data, which incorporated drawing on both qualitative and quantitative materials and resources that included: MS Forms survey instruments, direct interview instruments, Learning Design Workshop agendas, website engagement data and learning design analytics. These have been described previously in relation to RQ1, RQ2 and RQ3

Participants

43 respondents to RQ1, 20 modules from RQ2 and 14 BoS and SG members from interviews in RQ3.

Analysis

All qualitative and quantitative data from RQ1, RQ2 and RQ3 was uploaded to NVivo 12 and coded by Author 1 using the TPA diagram (figure 6) as a coding framework.

Findings

Material-economic arrangements (doings):

'Doings' refers to: 'the resources that make possible, or shape, the doings of a practice by affecting the what, when, how and by whom, something can be done' (Mahon, Kemmis, Francisco & Lloyd, 2017; 8). In the context of this study it refers to the activities that module teams undertake in order to get approval for their module such as, the action of completing the module specification, or attending an LDW.

The flexibility to be able to take into account the particular context of a module and adapt the 'doings', or specific learning design support offering to that context emerged as an important aspect of enabling learning design practice. For some, the ability to be involved in deciding how the time at the LDW was spent, and shape the agenda was very important. The LD Agenda analysis (figure 3) revealed a wide variety of activities took place at LDW depending on the context of the module. None of the 43 practitioners disagreed with statement 3 which said: *The agenda for the Learning Design Workshop provided an outline that met both the specific needs of the module team and also enabled participants to focus on the student experience* (figure 7). The intended learning designs produced by the module teams illustrate the contextual differences that impact on design intention and student experience (figure 12). In the interviews for RQ3, both SG and BoS members highlighted how they perceived the experience, resources and time available to academics and CMs as an important factor in the quality, confidence and efficiency of modules being approved.

Time also emerged from the collected data as an important theme in enabling or constraining learning design practice. The manifestation of this material-economic arrangement took several forms. 9 practitioners mentioned the timing of the LDW in their comments. 7 believed the LDW was too early in the design process whilst 2 said it came too late. All regarded this as a constraint on practice. LD Agenda analysis (figure 3) also revealed that the time spent at LDW varied, which for 4 practitioners at least was not long enough to fulfil expectations around what could be achieved. Provision for adequate structured preparation time for the LDW was also considered to be an enabler of practice by 11 practitioners. Perhaps most conclusively, figures 8 and 9 demonstrate the influence of time between LDW and SG on learning design practice.

The responses to survey statements 7 and 8 (figure 7) suggest that there were mixed attitudes towards the use of the Activity Planner as a way to represent intended learning designs. Further analysis of this data does show that responses to this question became more positive over time. Whilst some considered this to be a constraint to practice, at least 4 practitioners commented that they found it useful, helpful and student-directed. Figure 13 may tentatively demonstrate that the embedding of the Activity Planner as a 'doing' in learning design practice has enabled the inclusion of more 'active' learning approaches in design intentions over time.

Cultural-discursive arrangements (sayings):
'Sayings' refers to: 'the resources that prefigure and make possible particular sayings in a practice' (Mahon, Kemmis, Francisco & Lloyd, 2017; 8). In the context of this study it refers to the language of learning design as originally developed by the OULDI Project and shaped by STEM practice.

The use of consistent language in module specifications [04] and learning designs was referenced as enabling Bos and SG members to know 'what to expect' [11] and could be 'recorded and shared and analysed' [08].

Social-political arrangements (relatings):
'Relatings' refers to: 'the resources that shape how people relate in practice to other people and to non-human objects' (Mahon, Kemmis, Francisco & Lloyd, 2017; 8). In the context of this study it refers specifically to the relationships that exist in and around module teams.

The concept of learning design support structures as positively enabling consensus and collaborative practice was referenced by 9 practitioners in the qualitative comments of RQ1. 3 practitioners indicated how they felt their creative practice to was constrained by either external bodies or the bureaucracy of the University (as embodied in the learning design process). Analysis of the responses to statements 4 and 5 (which contain references to collaborative and consensus practice at the LDW) in the RQ1 survey (figure 7) show an increasing level of agreement with these two statements over time.

The relationship between online and distance learning practitioners and students is one that learning design seeks to improve. Many practitioners reported that activities such as developing 'student profiles', or mapping activities in terms of how students would be

spending their time using the Activity Planner enabled their practice to be more student focused.

Recommendations for Future Practice

The responses to the survey instrument used for RQ1, and the interviews conducted for RQ3, suggest that during the 4-year scope of this study the value of the learning design support in STEM (in relation to the OULDI established principles) has improved over time for academics, curriculum managers and governance stakeholders as the various arrangements have matured and become embedded.

The findings from the analysis of RQ2 suggests that the intended learning designs produced by STEM module teams during this period contain less assessment and assimilative activities, and more examples of 'active learning' when compared against the OU averages in 2016. However, there is no evidence in RQ2 to suggest that these categories particularly increased or decreased during the 4-year scope of this study. Rather that learning design intentions were made on the basis of contextual and subject basis. The extent to which these learning design intentions are then actually translated into module materials remains to be addressed.

Application of TPA to the collected evidence in RQ4 allowed for the identification of several specific arrangements that appear to constrain or enable the enactment of learning design practice in STEM. The discussion of these arrangements has, in turn, revealed a set of recommendations for improvement. These are discussed below and centre on the themes of; (i) time, (ii) contextualisation, (iii) experience, and (iv) a re-orientation of learning design from the OULDI orientation outlined in the introduction and literature review.

(i) Time. It is recommended that future effort is focused on encouraging module teams to think very carefully about the time taken between learning design events (such as the LDW) and governance approval (such as BoS and SG). For STEM the optimum time between an LDW and SG approval appears to be a window of 2-5 months. This period allows for design work and principles explored and started at the LDW to be finessed and developed to a level that is required for approval. It is recommended that module teams agree a preferred governance route and work backwards to ensure the learning design support happens in a timely way.

(ii) Contextualisation. It is also recommended that learning design is presented as an enabling, creative concept, and the perception that it stifles creativity and acts as a pedagogical constraint should be constantly and repeatedly challenged. Where this already takes place, it should be built on, and could benefit from the explicit use of the findings from this report. For example, the evidence gathered from RQ2 could be used to illustrate such a message with new module teams. Representing learning with the Activity Types Classification Framework should be emphasised as a way to capture and share learning designs and as a mechanism with which to discuss and celebrate contextual differences, rather than as an educational straitjacket. This recommendation will require the use of consistent, specialist language amongst staff supporting learning design activities and constant review. Module teams will need to continue to perceive agency in what they do and in order to accept the message that different learning designs being produced is OK.

(iii) Experience. A third recommendation is to establish mechanisms for sharing the experience of module teams in and around learning design. The extent of experience of module teams was an arrangement mentioned by several stakeholders in RQ3 that enabled or constrained quality, confidence and efficiency of module specifications. The concept of sharing practice was central to OULDI and was represented by, for example, the establishment of the Cloudworks website described earlier. Other studies confirm this. For example, a 2018 study found that 'all forms of [learning design] support those participants reported they drew on were inherently social' and concluded that '…these findings suggest the university teachers value support from credible others' (Agostinho, Lockyer & Bennett, 2018; 9 & 11). The MTC Induction Meeting and the MTC Induction Guidance Website can be seen as a way to share practice, but more direct support may be helpful. Whilst direct interaction between presentation teams is encouraged through mechanisms such as the L1 Chairs meeting, for example, equivalents do not exist for production. Anecdotally at least, there has been an increase in the level of experienced academics being assigned as co-chairs to production from within schools, but this could be expanded.

(iv) Re-orientation. The final recommendation is to consider activities that pivot learning design away from an association with 'process' and more towards a 'practice' and/or 'product' orientated view. Arguably, association with the introduction of the Stagegate process and the language of 'gatekeepers' and 'quality assurance' has positioned learning design as a process driven concept in the eyes of many OU staff. This may have resulted in a perception that learning design is done 'to' them, rather than 'with' them. Some evidence for this might be found in the finding established in this study that curriculum managers were in general more positive about learning design support than academics. Since a CM is primarily concerned with process orientated challenges this seems a plausible interpretation. Several stakeholders in the data sources gathered for RQ1 and RQ3 mentioned similar perceptions. However, now that that process is well established in STEM, future focus should centre around the value of emphasising the existence of all three orientations and explicitly referencing within which orientation the current learning design conversation is taking place. This approach could raise awareness about the theoretical underpinnings of learning design and shifting language choice during governance could lead to a more openly collaborative, less confrontational experience for module teams that opens up richer dialogue. Professional development activities, for example, may provide a mechanism for this.

Future Work & Limitations

The scope of this study is limited. It covers the period of time between initial agreement amongst stakeholders that a new module or significant rewrite is desirable, to the point of faculty approval for resources to be released. At this point there is still much learning design work to be done and this support is provided largely from outside the faculty. For this reason, future work could include developing case studies of modules that provide several different evaluation points. A comparison of final learning designs against intended learning designs using the Activity Types Classification Framework may also illuminate how design decisions and compromises need to be made by design teams. Establishing a link between this early phase of learning design practice and final design output would also allow for a closer

examination of the impact of learning design on students, which we have not been able to do here.

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Appendix A

RQ3: Interview Instrument - SG members

General introduction (5 minutes)

Confidentiality

This interview is being recorded so that it can be transcribed in order to help with our analysis. The data will only be used anonymously. They will be used for this study and any resulting papers or conference presentations, but respondents will never be identified within those data. Is that acceptable to you?

Introduction

Thank you for agreeing to participate in this research, your input is greatly appreciated. The purpose of the interviews is to ascertain whether the implementation of Learning Design has impacted on internal module approval processes since the inception of the STEM Faculty in 2016.

The following personal background information will inform your answers to questions in this interview:

1. your period of service on STEM Scrutiny Group/Board of Studies

2. your interpretation of the purpose of Scrutiny Group
3. your interpretation of your role in the approvals process

We are using a much wider definition of learning design here, than the one that is usually used (i.e. a facilitated workshop and the use of the Activity Planner). At its core, LD is about supporting and encouraging student-focused design practice. Those two main elements are clearly important and relevant, but there are a number of other support tools, activities, and practices that the STEM Deanery has developed to support module teams in the **pre-approval** stages. We are only concerned with **Deanery** (not LDS) support with the following pre-approval activities: (PP Slide)

Our questions will be in three sections:

- About the **quality** of the documentation submitted for approval
- About your **confidence** that the module teams had performed due diligence and the specification accurately reflected final intentions
- About any improvements in **efficiency** of internal processes because of Learning Design

When we ask our questions, they will form a pattern of:

- What did you think at the beginning of your tenure?
- What did you think at the end of your tenure?

As part of this interview process, I will be asking you to reflect a little on the total time you were/have been on SG/BoS now and how your perceptions may or may not have changed over time. We expect the interview to last no longer than 45 minutes.

Quality (10 mins)

I'd like to start by asking you some questions about your perceptions of the **quality** of the Module specification documentation that you were asked to look at whilst you were part of SG/BoS.
We're talking about NEW modules, with full REP03s that had the full LD treatment.

1. Thinking back to the beginning of your time on the committee, were there any particular parts of the module specifications that you remember being consistently missing?
2. At the beginning of your time on the committee, were there any parts of the module specifications that you remember being consistently of a high quality or very well-articulated?

Prompt: were there consistently particular areas or of a low quality or poorly articulated?
Prompt: were you thinking about specific modules/times/conversations?
Prompt: maybe you can think of occasions where there was a long list of discussion questions for the module teams? Can you talk about that a little more?
Prompt: areas that might have been poorly articulated or missing/well-articulated

- Student profile
- Activity Planner
- Module learning outcomes and mapping of module learning outcomes to qualification outcomes and qualification pathway
- Skills mapping
- Tuition strategy
- Assessment strategy
- Module Costing (using module costing tool)

3. Moving on to the end of your time on the committee, were there any particular parts of the module specifications that you remember being consistently missing?
4. Moving on to the end of your time on the committee, were there any particular parts of the module specifications that you remember being consistently of high quality or well-articulated?

5. Thinking specifically about the module specifications you saw at the beginning of your service on SG/BoS, to what extent did the paperwork provide enough information to enable approval? Would you say a) never b) infrequently c) mostly d) always?

6. If I ask you the same question again about the final module specifications you saw going through the approvals process, is your answer different?

Confidence (10 mins)

Next, could we move on to considering to what extent you had **confidence** that the module teams had performed due diligence and that the Module specification accurately reflected final intentions.

7. At the early stages of your time on the committee. To what extent were you confident that the module teams were sufficiently well prepared to enter the production phase and had developed a plan that would not alter significantly going through to first presentation?

Prompt: Can you remember any occasions when you were not confident/confident, or you were/were not concerned that the module teams would need or want to make changes post approval?
Prompt: Can you remember specific examples where module teams were required to come back with a new request for further approval as a result of making post approval changes to the Module specification?
Prompt: areas where preparedness (or lack of) may have been apparent:

- Was there a full pedagogic risk assessment?
- Had IUPC planning been considered?
- Had CM and Academic workloads been agreed?
- Had use of scheduled and unscheduled tutor contact hours been adequately planned?

8. Comparing the early stages of your time on the committee to the latter stages, did you notice any difference in how confident you felt in the preparedness of the module teams to enter the production phase? Did you feel more confident, less confident, or about the same that they had developed a plan that would not alter significantly going through to first presentation?

9. On a scale of 1 to 10, how would you score your confidence that module teams were adequately prepared to enter the production phase when you first started on SG/BoS and for the first few Module specifications you saw?

10. On a scale of 1 to 10, how would you score your confidence that module teams were adequately prepared to enter the production phase SG/BoS and for the last few Module specifications you saw?

Prompt: To what extent did you feel that there had been developments in the preparedness of module teams coming out of the design phase and into commencement of production?

Efficiencies (10 mins)

Finally, I would like to ask you about whether or not you think there have been enhanced efficiencies in approval processes or other areas as a result of the implementation of Learning Design in STEM.

11. When you first started considering module specifications for approval, how satisfied were you that the Board of Studies had been able to fully consider the module proposals from the submitted documentation?

Prompt: to what extent were crucial topics addressed?

- School strategy and Qualification fit
- prerequisites and/or corequisites, mapping to qual learning outcomes
- overlap/consistency of content and assessment
- flexible study intensity and presentation patterns
- resourcing (staffing), resourcing (media strategy/LDS requirements) and financial contribution

Prompt: Do you have any examples that stick in your mind to justify your answer?

12. Thinking of the most recent module specifications you considered for approval, how satisfied were you that the Board of Studies had been able to fully consider the module proposals from the submitted documentation?

13. Did you notice any other areas where efficiency had changed over time?

Prompt: to what extent was there a change in:

- time taken for modules to progress to presentation
- time taken to discuss module specifications at meetings
- understanding of module teams of good practices in design
- understanding of module teams of approval processes

14. Have you attended any Learning Design events prior to the module specification form being produced?

15. If yes, to what extent did you notice an effect from Learning Design on the output of the Module specification form?

Prompt: What aspects from the Learning Design event did you consider the most noticeable in the output of the Module specification form?

Prompt: How much do you think that the Learning Design event prompted the early intentions of the module teams to change?

16. If no, what is your perception of what happens at LD event?

Final Summary (5 mins)

Thank you for your insights today. There is one final question. (return to PP slide)

17. Reflecting on your answers to the questions we have already gone through, and thinking about the planning and design support functions provided by the Deanery towards module specification approval, are there any areas you would call out where a) the support is working well or b) where further development might be beneficial?

Prompt: ask for both a) and b) if not answered

Prompt: More help with:

- media strategy
- assessment strategy
- use of interactives/experiments
- specialist and third party equipment
- rights issues
- module specification form