

Frameworks to Guide Practice

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Editors' Introduction

In this resource, Conole has collected together some frameworks which can be used to guide teachers through the design process. Previous chapters have shown how research into how teachers create, visualise and share designs has uncovered the complexity of this process and the need to understand design as a social practice. Alongside this research, there has been increasing interest in supporting design as a collaborative process which takes place within a disciplinary and institutional context. These frameworks presented here provide support for key decisions (e.g. what technologies to use, what activities to run), and emphasise different choices depending on their conceptual underpinnings and the scenarios in which they could be used.

Introduction

Digital technologies offer a wealth of ways in which students can interact with rich multimedia resources, and mechanisms to communicate and collaborate. Despite this, technologies have not been used extensively; most Learning Management Systems (LMS) for example are primarily used as content repositories (Conole 2004). Academics say that they do not have the time or skills to effectively use technologies in their teaching. Learning Design has emerged over the last ten years or so as a means of addressing this gap between the promise and the reality of the use of digital technologies. Fundamentally Learning Design is about helping practitioners make pedagogically informed design decisions that make appropriate use of digital technologies (Conole 2013). At the heart of this are three facets: guiding the design process, providing a mechanism for visualising design (in essence an educational design language), and enabling sharing and discussing of designs.

In recent years a number of frameworks for Learning Design have emerged. Frameworks are important because they can provide academics with a structured approach. Frameworks can be adopted in practice in

a number of ways: paper-based, process-based (workshops, for example), or system-based (i.e. as online planning tools). The focus of this chapter is on the first two; the resources section at the end of the chapter lists a number of tools. Ultimately the aim of Learning Design frameworks is to help academics create engaging learning interventions that enhance the learner experience. However, establishing a direct causal link between Learning Design and student learning outcomes is notoriously difficult (Brown, Conole and Beblavy 2019). No matter how good the Learning Design, teachers still matter most (Patrick n.d.). Some argue that there is a need to create a universal Learning Design pedagogical pattern language (Goodyear 2005; Laurillard 2012). However this chapter argues that we are nowhere near that stage and in reality may never be.

The chapter describes a range of frameworks to guide learning design, the focus or theoretical lens of each is described, along with underpinning assumptions and how it can be used. Frameworks can be grouped as follows:

- Frameworks for guiding the use of technology/media/materials (SAMR, SECTIONS, COACT)
- Workshop approaches aimed mainly at promoting general good practice. i.e. social constructivist assumptions (7Cs, 8LEM, ABC)
- Approaches based on a specific theory of learner engagement (ICAP)

Frameworks for Guiding the Use of Technology/ Media/ Materials

The SAMR Model

The SAMR model consists of four levels of technology integration (Puentedura 2013; Romrell, Kidder and Wood 2014):

- **Substitution:** The technology provides a substitute for other learning activities without functional change.
- **Augmentation:** The technology provides a substitute for other learning activities but with functional improvements.
- **Modification:** The technology allows the learning activity to be redesigned.
- **Redefinition:** The technology allows for the creation of tasks that could not have been done without the use of the technology.

It provides a framework for designers to create optimal learning experiences. Learning activities that fall within the substitution and augmentation classifications are said to enhance learning, while learning activities that fall within the modification and redefinition classifications are said to transform learning. Table 10.1 provides examples of how SAMR can be

Table 10.1 Examples of use of SAMR

<i>Substitution</i>	<i>Augmentation</i>	<i>Modification</i>	<i>Redefinition</i>
Making workshop materials available online or via a website.	Providing resources in a variety of media to meet different needs, allowing participants to choose which works best for them. Participants brainstorming ideas together on a topic or potential solutions to a problem. Collation of resources on a topic using a collaborative tools such as Google Drive.	Use of social media such as Twitter to be part of a broader community and use this to ask questions or gain access to interesting resources of relevance to their professional practice.	Participants create their own Personal Learning Network using a variety of tools and work with others to collaborate, share ideas and resources, and reflect on their practice. Keeping a reflective blog of their practice and commenting on the blogs of other participants.
Replacing a hand-written flipboard with written content.	Written content is made available online so that others can see it.	Content is made available on a blog so that others can review and comment.	Participants collaboratively develop and comment on content in a collaborative tool such as Google Drive.
An oral presentation is supplemented with a Powerpoint presentation.	Flipped classroom techniques where participants work through materials in advance of a face-to-face session, allows to work through content on their own and then bring questions to the workshop for clarification.	Participants connect with each other using social media so that they can talk to each other about their understanding of the materials they are reviewing in advance of the face-to-face session.	Following their discussions of the materials they have reviewed in advance of the face-to-face session, they use a collaborative tool such as Google Drive to develop a set of joint questions to ask the facilitator in the face-to-face session.
Concept mapping software is used to replace a paper-based concept map.	Concept maps can be annotated and links added.	Concept maps and associated links are made available as part of a blog post so that others can see and comment on.	All the group concept maps are collated and made available online, along with comments, facilitators comment on the concept maps.

Source: Adapted from Portnoy (2018).

used. Portnoy (2018) provides practical examples of how each of the four levels of SAMR can be implemented.

The SECTIONS Framework

Bates (2015) argues that the SECTIONS framework can be used to make effective decisions about the choice and use of media for teaching and learning. It stands for: Students, Ease of use, Costs, Teaching functions, Interaction, Organisational issues, Networking, and Security and privacy.

Three issues are related to students when choosing media and technology: student demographics, access, and differences in how students learn. In terms of ease of use, both teachers and students need digital literacies to make effective use of digital technologies. There has been a dramatic reduction in the cost of media in recent years. Cost can be broken down into costs associated with development, delivery, maintenance, and overheads. A number of factors are associated with the teaching functions, such as the coherence of the materials (in terms of the mix of text, images, sound and video, the need for clear signalling, avoiding redundancy, and segmenting). Moore (1989) identifies three types of interaction: student-content, student-teacher, and student-student. Hillman, Willis and Gunawardena (1994) added a fourth; student-interface. Factors to consider in relation to organisational issues include: the way in which institutions structure teaching activities, the types of technologies available and the nature of the technologies that are supported. The rise of social media has led to the increasing importance of taking account of networking when designing learning interventions. Social media can supplement institutional support technologies such as a Learning Management System and enable students to be part of a global community of peers. Finally, it is important when designing to give due consideration to security and privacy issues.

Bates lists the following questions to guide the design process: Who are the students? What are the desired learning outcomes? What instructional strategies will be used? What are the unique educational characteristics of each technology and how well do these match the learning and teaching requirements? What resources are available?

Bates and Poole (2003) argue that the framework has a number of benefits. First, it will work in a variety of learning contexts. Second, it allows decisions to be taken at both a strategic, institution-wide level and at a tactical instructional level. Third, it gives equal attention to educational and operational issues. Fourth, it will identify critical differences between different media and technologies, this enabling an appropriate mix to be chosen for a given context. Fifth, it is easily understood, pragmatic and cost effective. Sixth, it will accommodate new developments in technology.

The COACT Framework

Hibernia College in Dublin has developed the COACT pedagogical principles that they use as the basis for the development of their learning material (Breakwell and Cassidy 2013: 2):

The COACT model is a theoretical framework that forms the basis of lesson design and structure, with a view to ensuring that higher-order learning and reflection is embedded within the learning process. The framework builds on Säljö's hierarchy of learning (1979, 2004, 2010) and the ETL Project at the University of Edinburgh (Entwistle 2004). The definition of the word 'CO-ACT' is at the heart of the student learning experience: COACT = 'CO': 'together' + 'ACT': 'to take action, do something'. This definition, upon which the framework is based, represents a mutually constructed, active approach to learning.

The model breaks the learning experience down into five stages, which represent a progression from lower-order towards higher-order learning; from 'seeking meaning' through to interpretation, critical analysis and application of knowledge. The five stages are:

- Concept: describe and contextualise main concepts
- Overview: summarise expectations, including objectives and outcomes
- Active discovery: facilitate active and collaborative discovery
- Critique: empower students to construct evidence-based criticisms
- Think: encourage reflection on relevance and importance of concepts.

Breakwell and Cassidy (2013) compared student feedback and grades across two cohorts of graduate students enrolled on the same ITE programme for primary school graduate students teachers. Evaluation was positive and included increasing satisfaction with tutor performance. They argue that this finding suggests that a model of online content development and delivery that is specifically designed to encourage interaction, or COACTION, between learner and facilitator and between learner and learner, can enhance students' impressions of tutor interaction and tutors' teaching quality.

Frameworks for Workshops

The 7Cs of Learning Design Framework

The 7Cs of Learning Design framework emerged from empirical data on how academics design learning interventions. Interviews were held and academics were asked: how they went about designing learning interventions,

where they got inspiration and guidance, and how they represented and shared their designs. Figure 10.1 shows the 7Cs framework. Each C has associated with it a set of resources and activities to guide the design process (Conole 2016).

The first C, Conceptualise, is about creating a vision for the course or module being designed. It helps the teacher/designer think about the nature of the learners who are likely to take the course or module, their age range, diversity, characteristics, skills, perceptions, and aspirations. It is also about articulating the core principles associated with the course or module. The next four Cs are concerned with designing the resources and activities that the learners will engage with. The Create C helps the teacher/designer articulate what learning materials need to be created, whether these are text-based, interactive materials, podcasts or videos. In addition, it covers the use or repurposing of open educational resources. Finally, the teacher/designer might also create some activities, which require the learners to create their own content. The Communicate C is concerned with methods to facilitate communication, between the learner and the tutor, the learner and their peers, and the broader community through social media. This might range from effective mechanisms for fostering discussion in a forum, through effective moderation, or looser communication through social media. Similarly, the Collaborate C is about fostering mechanisms to enable

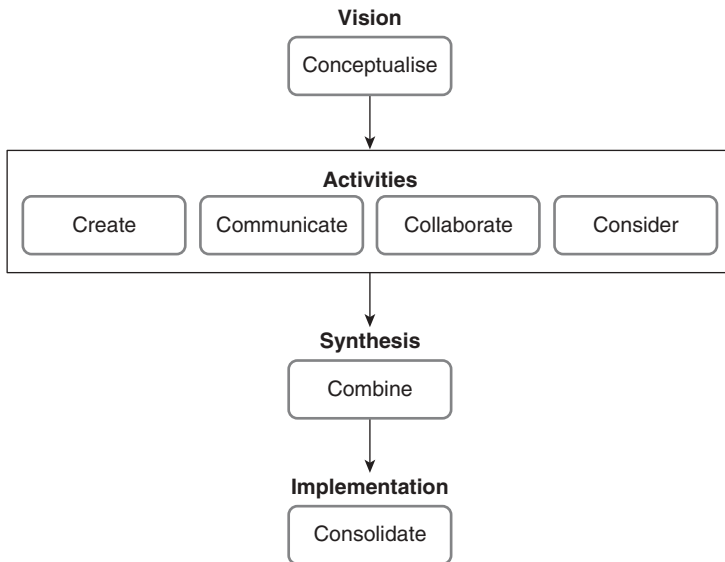


Figure 10.1 The 7 Cs of learning design

collaboration or group work. The Consider C is concerned with ways in which reflection and demonstration of learning achievements can be promoted. Assessment might be diagnostic, formative, summative or peer reviewed. The Combine C enables the teacher/designer to step back and reflect on the design process to date and look at the design from different perspectives. Finally, the Consolidate C is about implementing the design in a real-life context and evaluating its effectiveness.

When designing learning interventions, academics typically focus on content; the 7Cs framework enables them to think beyond content to the learning activities the students will engage with and the student experience. The 7Cs framework has been used in hundreds of workshops. Conole (2014) describes some early evaluations of the framework. This consisted of observations of the workshops and gathering of data from participants around four main questions: What three words best describe the workshop? What did you like? How could the workshop be improved? And what action plans would participants do as a result of participation? Overall the evaluation was positive, participants found the workshops engaging, useful, and inspiring. Participants stated that the workshop helped them to be more creative and innovative in their design practice. Working in teams means that participants can build on each other's knowledge. More details of the evaluation and some illustrative quotes can be found in the paper.

The 8LEM Framework

The 8Learning Events Model (8LEM) describes eight key teaching and learning activities: receive, imitate, practice, explore, create, experiment, debate, and meta-learn (Verpoorten, Poumay and Leclercq 2005). It proposes a set of eight specific ways, referred to as Learning Events, of learning/teaching that a teacher can use to describe any point in the development and analysis of learning activities. Each of these considers what the students and teachers do. For example, for 'explore', the student activity would be 'let me browse' and the teacher activity would be 'here are some possible resources'. The 8LEM framework can be used as a descriptive aid to analyse an existing teaching sequence or as a prescriptive aid for creating new teaching sequences.

Receive refers to traditional didactic transmission of information such as reading or lecturing. Debate refers to learning through social interaction, collaboration, and discussion. Experiment refers to the student manipulating data to test a hypothesis. Create refers to the student creating something new, such as writing an essay. Explore refers to the student for example doing a literature review or searching for resources on the Internet. Practice refers to the student applying a theory and receiving feedback. Imitate refers to learning through observation and imitation. Finally, meta-learn refers to student self-reflection on their learning process.

Ulster University has adapted this to create the Hybrid Learning Model and produced a set of flash cards for each of the eight learning events. On one side the role of the teacher and the student is described, on the other a set of relevant verbs for the teacher and student roles are described. An example of one of the flashcards (experiment) is illustrated in Figure 10.2. It shows that the teacher’s focus is on providing the students with a micro-world to manipulate, whilst the student is using this to test their hypothesis. On the back of the flashcard are the verbs the teachers and students can use to facilitate experimentation.

Villina *et al.* (2008) carried out an evaluation of the hybrid learning model with 51 academic staff, through interviews, focus groups and workshops. Four main benefits of using the model emerged, that it: helped articulate practice, supported self-reflection, acted as a design aid, and provided an awareness of the learner roles.

Experiments Reactivity/Experimentation (Simulation, Testing, Transformation)	
Teacher Here is a micro-world you can manipulate	Learner Let me check my hypothesis
Practical, workshops, problem solving	

Experiments		
Teacher	Learner	
Assess	Access	Observe
Coach	Analyse	Perform
Construct/Produce/Create	Apply	Predict
Critique	Construct/Produce/Create	Present
Explain	Decide	Question
Justify	Describe	Reflect/Respond
Monitor	Design	Refine
Observe	Evaluate	Reflect
Perform	Explain	Report
Present	Explore	Research
Question	Justify	Resolve
React/Respond	Monitor	Review

Figure 10.2 An example of an 8LEM flashcard
 (Source: Alan Masson <http://addl.ulster.ac.uk/odl/hybridlearningmodel>)

The ABC Learning Design Framework

The ABC Learning Design framework is a workshop where participants work together in a game format to create a visual storyboard outlining the types and sequence of learning activities against a set of learning outcomes. It is based on six types of learning activities: acquisition, collaboration, discussion, investigation, practice and production (Laurillard 2012).

Learning through acquisition is what learners are doing when they are listening to a lecture or podcast, or reading. Learning through collaboration is concerned with discussion, practice, and production. It is about the process of shared knowledge building. Learning through discussion gets the students to articulate their ideas and question and to challenge and respond to the ideas and questions from the teacher and/or their peers. Learning through investigation guides the student to explore, compare and critique texts or resources that reflect the concepts and ideas being taught. Learning through practice enables the students to adapt their actions to a task and use the feedback to improve their next actions. Learning through production enables the student to consolidate what they have learnt by articulating their current conceptual understanding and how they use it in practice.

For each type of activity examples of how this can be achieved through conventional methods and use of digital technologies are provided. For example, for acquisition, conventional methods would include reading papers or listening to presentations, whereas acquisition through digital technologies might include reading websites, listening to podcasts or watching videos. Figure 10.3 shows the card for 'production'. The front of the card indicates that 'production' is about enabling the students to consolidate what they have learnt, for example by writing an essay. The back of the card provides examples of how this can be achieved by conventional and digital methods.

In the workshops, participants begin by writing a short description of the course that is being designed. They then agree on the balance of each type of learning activity and the mix of face-to-face and online activities. Finally, they think about the formative and summative assessment needed to achieve the learning outcomes. Young and Perovic (2016) list a number of benefits of the ABC framework. First, it can help develop richer learning designs for blended learning. Second, it can integrate strategic initiatives such as digital skills or employability. Third, it can connect learning outcomes/assessment to practice. Fourth, it can facilitate cross-team communication and sharing. A short video (<http://blogs.ucl.ac.uk/digital-education/2015/04/09/abc-arena-blended-connected-curriculum-design/>) of participants' evaluation of the workshop is available. Participants state that the workshop was useful in mapping out objectives, and that it enabled them to see the

broader picture, understand what actual activities can be used, and identify opportunities for formative assessment.

Learning Type: Production

Learning through production is the way the teacher motivates the learner to consolidate what they have learned by articulating their current conceptual understanding and how they use it in practice

Learning type: Production	
Conventional method	Digital technology
Producing articulations using: <ul style="list-style-type: none"> • Statements • Essays • Reports • Accounts • Designs • Performances • Artefacts 	Producing and storing digital documents Representations of designs Performances, artefacts Animations Models Resources Slideshows Photos Videos Blogs E-portfolios

Figure 10.3 The production card
 (Source: Alan Masson <http://addl.ulster.ac.uk/odl/hybridlearningmodel>)

Approaches Based on a Specific Theory of Learner Engagement

The ICAP Framework

ICAP stands for Interactive, Constructive, Active, and Passive. It defines cognitive engagement activities on the basis of students’ overt behaviours and proposes that engagement behaviours can be categorised and differentiated into one of four modes: Interactive, Constructive, Active, and Passive (Chi and Wylie 2014). Student engagement refers to whether students are:

- Motivationally engaged (interest in content domain, pursue degree),
- Behaviourally engaged (attend classes, do homework: broad behaviour),
- Cognitively engaged (refers to use of strategies or to motivational constructs).

They propose four modes of behaviour:

- Attending mode (or passive mode): Students are paying attention, oriented toward and receiving instruction, but they are not doing anything else overtly, i.e. they are not producing anything. Examples include: listening to lectures without taking notes, watching videos, observing a demonstration, or reading a worked-out example.
- Manipulating behaviour (active mode): Students are paying attention and physically manipulating the instructional materials, but not adding any new information. Examples include: copying the solution from the board, underlining important sentences, agreeing in dialogue, selecting an option, moving a slider, measuring quantities, recording amount, pointing and gesturing, repeating definitions.
- Generating behaviours (constructive mode): Students are producing some additional information that may contain (incidentally or intentionally) small (or large) pieces of knowledge that is not in the instructional materials. Constructive does not mean that students are discovering knowledge/principles novel to the domain. Rather students are adding minute pieces of knowledge beyond what was presented in the instructional materials, literally. Cumulatively, they end up constructing an understanding. Examples include: drawing, explaining, posting, taking in one's words, providing, comparing and contrasting, evaluating, predicting, reflecting, monitoring.
- Collaborative behaviour (interactive mode): Behaviour of working with a peer (commonly through dialogues): Taking turns, sharing attention. Sometimes this has been referred to as transactive dialogues. Examples include: explaining jointly, debating with a peer, or discussing.

There are four knowledge processes: storing (new information), activating (relating to prior knowledge), linking (new information with prior knowledge) and inferring (a new piece of information). Chi and Wylie describe the ways in which the ICAP framework can be used to improve: lecturing, discussion, worksheet activities, co-constructive collaboration and using digital tools. Chi and Wylie (2014) argue that the ICAP hypothesis predicts that as activities move from passive to active to constructive to interactive, students undergo different knowledge-change processes and, as a result, learning will increase. This hypothesis has been validated through a number of classroom and laboratory studies. Two examples of how ICAP can map to presentation of information or communication are provided in Table 10.2.

Conclusion

The frameworks foreground a number of benefits from the use of digital technologies in learning. These include: freeing up time for face-to-face contact,

Table 10.2 Mapping Presentation Tools and Presentation of Information of Communication to the ICAP Framework

<i>ICAP level</i>	<i>Passive attentive</i>	<i>Active manipulative</i>	<i>Constructive generative</i>	<i>Interactive co-generative</i>
Tool				
Power Point	Instructor presents information on PowerPoint		Instructor can pause and ask questions	
Video		Watching videos without taking any actions	Pause and rewind or fast forward	Watch video with others, pause and discuss issues
<i>ICAP level</i>	<i>Passive attentive</i>	<i>Active manipulative</i>	<i>Constructive generative</i>	<i>Interactive co-generative</i>
Tool				
Discussion forum	Reading other people's posts	Answering others' questions or comments	Answering questions or elaborating on comments with explanations	Co-editing an answer to a question with peers
Google docs	Reading other people's posts	Summarising a post	Revising a post with new information	Re-revising other people's posts

allowing students to study at times which are most conducive to their learning, providing opportunities for self-testing to reinforce factual knowledge, facilitating the collection of and feedback on assignments, encouraging peer support and greater participation from students, enabling effective learning within and across different groups of learners, and fostering the development of key skills and attributes, including collaborative skills, autonomous learning and digital literacy.

The frameworks provide academics with a different set of ways of thinking about design. Masterman (Chapter 7) argues that design tools support teachers' current design practice and simulate them to innovate. SAMR focuses on progressive integration of digital technologies. SECTIONS also focuses on the choices and use of media, in relation to a set of questions guiding the design process. COACT focuses on how different types of learning, such as knowledge acquisition, communication and reflection can be instantiated through both face-to-face teaching and use of technologies. The 7C provides a practical set of resources and activities to guide the design process.

8LEM foregrounds the eight ways in which learners can learn and considers the associated activities of each for both teachers and learners. ABC adopts a similar approach but is based on six types of learning activities derived from Laurillard (2012). ICAP adopts a different approach focusing on learner engagement.

The choice of which framework to use is dependent on a number of factors: the academics' pedagogical beliefs, their level of expertise in design and in the use of technologies, and the perceived ease of use. It was stated at the beginning of this chapter that Learning Design has three facets: guidance, visualization (which the frameworks described in this chapter can provide), and sharing. Masterman (Chapter 7) highlights the importance of informal conversations about teaching and learning, which Thomson and Trigwell (2016) refer to as 'corridor conversations'. Masterman's research on teachers' design practice paints a complex, composite picture of design practice that has to do with the proclivities of individual practitioners and a range of intellectual and sociocultural influences, along with the nature of the process itself. She also argues that a number of barriers to effective design remain, including the challenge of facilitating thinking processes that may be both tacit and idiosyncratic to individual teachers, disciplines and institutions.

The frameworks described in this chapter provide mechanisms to help academics rethink their design practice to create pedagogically informed design decisions that make appropriate use of digital technologies. Given the gap between the promise and reality of digital technologies for learning and teaching described in the introduction, such frameworks are important in terms of providing support for academics to enable them to create engaging learning interventions that enhance the student experience. Whilst some of the frameworks are purely conceptual, others have been incorporated into Learning Design tools.

Resources

The 7Cs of Learning Design workshop:

The workshop outline and associated resources and activities is available at www.slideshare.net/GrainneConole/learning-design-workshop-2017

The 8LEM resources from Ulster University

<http://cetl.ulster.ac.uk/elearning/documents/About-HLM.pdf>

The Learning Activity Management System (LAMS):

www.lamsinternational.com/

The Integrated Learning Design Environment (ILDE):

<https://ilde.upf.edu/about/>

The Learning Design Support Environment (LDSE):

<https://sites.google.com/a/lkl.ac.uk/ldse/>

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