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LEARNING DESIGN IN THE NEW DIGITAL AGE

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Introduction

The relatively new field of Learning Design has the potential to offer ways of representing, communicating and critiquing learning ideas, patterns and experiences across different subjects and from multiple perspectives. It provides opportunities for institutions to develop ideas to refresh formal learning and professional development, as well as to build capacity into their particular learning cultures and student experiences. Achieving this within the context of the digital age comes with a number of unique research challenges. The STELLAR[1] network identifies these as:

- Seeking appropriate forms for representing design knowledge in Technology-Enhanced Learning (TEL) and ways these can be effectively blended into the discourse and practices of educators, researchers and policy makers;
- Empowering and supporting educational practitioners in reshaping their role from providers of knowledge to designers of TEL experiences;
- Evaluating the quality of design products and processes in TEL and assessing the impact on learning (Fischer, 2014).

This chapter explores some of the issues that confront students and teachers as they work to re-invent teaching routines and embed within them new designs for learning. Drawing on the growing literature on digital literacy, the authors attempt to illuminate the ways the Larnaca Declaration of Learning Design's core elements of representation, sharing and guidance could be developed for supporting teaching and learning within a digital context. The aim is twofold: to enable the production of a more effective, innovative and transparent pedagogy, so that staff feel more empowered to change their teaching; to help institutions to identify the policies, procedures and structural reforms that will encourage good teaching and assessment, thereby maximizing student employment outcomes and promoting life-long learning.

The Relationship of Digital Literacy to Learning Design

Whilst the Larnaca Declaration tries to avoid favouring or prioritizing any particular pedagogical approach, theory or system, it does recognize the changing nature of working within a digitally enabled and connected environment and the impact this has on students and staff (See Chapter 1). Indeed, the reality of operating, learning and working within a global digital environment cannot be overlooked or avoided. In his book, *The New Digital Age*, the chairman of Google, Eric Schmidt, notes:

> The most important pillar behind innovation and opportunity—education—will see tremendous positive change in the coming decades as rising connectivity reshapes traditional routines and offers new paths for learning.
>
> (Schmidt, 2013, p. 21)

A simple survey of higher education institutional websites indicates that representing, communicating and disseminating *research* in the digital age has been clearly understood—key in /(forward-slash) the term "research" after any higher education institutional Web address and a "glittering world" of new knowledge is presented to the interested investigator. The opposite is true for *teaching and learning*—try the same using the terms "/learning" or "/teaching" and, more than likely, the investigator will be served with a *Forbidden page* or *Error 404 Page not found*. For most higher education institutions across the world, teaching is the primary source of income, but within and across disciplines, the design, representation and delivery of teaching remains hidden, unshared, uncoordinated and largely uncelebrated. Have institutions merely failed to understand the importance of conveying this core institutional information, or are they simply struggling to articulate to their audiences the essential qualities underpinning their designs of teaching and learning?

Currently, practitioners face many challenges in achieving the development of a relevant and useful education. In the West, there is a shift from teaching to learning, from transmission to co-creation, from teacher-as-producer to student-as-producer and from teacher as change agent to student as change agent. These transitions require the development of different relationships and pedagogical models. For example, the proliferation of digital content in open environments accessed by ubiquitous personal devices has, ironically, led to the reclassification of the traditional large lecture as a distance education method, characterized by

the remote experience of students, often passively sitting in a large lecture theatre, perhaps struggling to hear or see and with little chance of engaging directly with the lecturer. Contemporary technology, meanwhile, provides many opportunities for students on and off campus to access knowledge and develop attributes that will help them to thrive in the digital workplace. Barber (2013) goes further, suggesting that students should aspire to learn and practise the skills associated with being innovative: They should seek to be on innovative teams within innovative organizations and become part of an innovative society; here, they will grow and develop the skills needed to be globally competitive. All educational institutions must therefore constantly reflect on their position within this network and act to give their students the best preparation for work in a digital world.

Current trending patterns identified by long-standing research bodies indicate the emergence of open content, mobile learning and massive open online courses—MOOCs (Johnson, et al., 2014; Sharples 2013). These require educators to respond by designing appropriate agile learning environments and activities that will enable students to better construct real-world knowledge and to engage more meaningfully with their teachers and peers, thus preparing them properly for potential employment. The continuing evolution of learning technologies gives educators and learners incomparable opportunities to access, create, organize, share, critique and aggregate knowledge. Educational institutions have been given new ideas that can help them rethink what they do and how they do it.

Today's students have different expectations of their academic experience from those in the past. They use digital technologies, they multi-task and they collaborate; they are therefore less patient with the teacher-centric styles of education that still, to a large extent, dominate higher education, where technology is mostly used to replicate traditional learning and teaching practices (Beetham, 2013; Dahlstrom, 2013). As Bryant and Walker note:

> the learner generally arrives at university with a digital backpack of devices, skills and an already existing, or perhaps nascent set of connections and networks.

> (2013, p. 2)

The reality is that the majority of students across the developed and developing world have now grown up with access to information and communications technology (ICT) and are therefore already e-learners. They have used digital technologies in their schools, libraries and homes to support their formal education and used them informally for a variety of other educational purposes, including learning for hobbies, pursuing personal interests and solving problems. However, today's students face continual oscillation between formal institutional learning and informal learning, between learning for personal growth and learning for work. This places high demands on them to self-manage their learning. It is true that students arriving at university often display a wide disparity in skills and knowledge, including their ability to use digital tools for learning. It follows that teachers may make incorrect assumptions about students' individual capabilities as digital learners, with consequent negative impact on their long-term learning and future success. Students certainly report critical moments in their transition to learning in higher education—for example: "*My first experience of [lecture] PowerPoint*", "*lectures with projector facilities were new to me*", and "*working collaboratively*" (Kerrigan & Walker, 2013)—and teachers should be attentive to the implications of these. Notwithstanding the cultural complexity and heated debates about the digital divide, the concept of digital literacy is attracting more critical and academic interest and is now represented in various educational frameworks[2] and institutional strategic documents.

In the Larnaca Declaration, digital literacy is viewed as "*the development of critical reflection on life and work with digital technologies*" (See Chapter 1, p. 20). Digital literacy is linked to a number of research and practice fields—such as library and information studies, media and film education, academic literacies, educational technology and digital humanities (Fransman, 2013)—and reveals a set of tensions, interactions and debates between culture and technology. Previously, discussion about digital literacy tended to focus on functional IT/ICT skills development and how to integrate this into a formal curriculum. The agenda promoted technical skills development rather than raising questions about how digital literacy is constructed and the power relations that permeate its formation and distribution.

More recently, Hinrichsen and Coombs (2014) argue that the shift from a technological hard IT/ICT position to a more complex and nuanced concept of literacy within a digital context has provided a new opportunity to look more broadly at the sociocultural practices and discourses that exist. Their re-interpretation of Luke and Freebody's (1999) original work refines and elaborates a critical digital literacy framework, which focuses on learner processes that fit the practices of reading and writing in and for the digital environment. Alongside activity areas of *Decoding, Making Meaning, Using* and *Analyzing*, a new element, *Persona*, has been added (Figure 4.1). *Persona* comprises *Identity Building, Managing Reputation* and *Participating* (Table 4.1).[3]

Today's graduates face selection scrutiny of a kind experienced by no previous generation, as employers are currently free to exploit every digital source of information about them that they can find and feel at liberty to make their decisions about individuals' life chances based on it. Teaching students how to safeguard identity and manage reputation presents an immediate and a continuous challenge. Our learning designs need to enable students to become sophisticated graduates, capable of adding value to their employers' products and services whilst simultaneously avoiding the digital faux pas that can occur in a globally connected world. Understanding how technology can contribute to the acquisition of 21st-century skills, attributes and literacies and how strategically to support these changes is not so much a debate about the technology itself, or what

FIGURE 4.1 Model of critical digital literacy

TABLE 4.1 Persona of the CDL Model

Identity Building	Managing Reputation Management	Participating
The development of a sense of one's own role within different digital environments and sensitivity to relationships and alignments within groups and communities. An understanding of the multifaceted nature of identity, how this operates in different contexts and the relationships between digital and other identities.	Learners need to be aware of their own and their communities' reputations as assets that should be developed and managed effectively to support aspirations, such as those related to career and employment. They need to safeguard against loss of reputation, understanding how to protect and partition their online activity.	The ability to work with others in a variety of modes (e.g. synchronous and asynchronous) via digital interaction and exchange. To experience the contribution that individuals, groups and communities can make to an activity or endeavour. Awareness of the ethical and cultural challenges this raises.

platforms or systems are deployed, but about how it can support structural and cultural change and drive the development of new practices. The challenge for Learning Design theory and the further development of the Larnaca Declaration is not only to embed critical digital literacy into the development of learning practices, but also to contextualize this as part of successful Learning Design.

Digital Literacy and Learning Design

The focus of this chapter has so far been mainly on the student, but it is important to remember that it is predominantly academic staff who influence students' learning in a formal setting. Staff capability has a key role to play in developing and supporting the students' journey towards becoming digitally literate and consequently is intrinsically linked to the personal development of each member of staff. This creates a relationship between student and staff digital literacy, which, if a learning design is going to succeed, needs to be fully understood. This relationship can be conceptualized using a simple model (Figure 4.2), whereby staff and student critical digital literacy abilities are plotted against each other by means of four quadrants. The four shaded quadrants represent different scenarios. In this example, the horizontal axis and vertical dashed line, representing staff, and the vertical axis and horizontal dotted line representing students, express equal critical digital literacy ability. Anything to the right of the dashed line is above the level of staff critical digital literacy, and anything to the left, is below it. For students, anything above the dotted line exceeds their critical digital literacy level and anything under is below it. The top right quadrant, which is above the level of both students and staff, indicates an area of risk in which staff do not have the critical digital literacy level to teach or support their students. In the bottom right quadrant, the critical digital literacy level is above that of staff but below that of students. In the bottom left quadrant, both staff and students have a critical digital literacy level to engage with material, although there is no critical digital literacy development for the students, whereas in the top left quadrant, the critical digital literacy level of the staff is higher than that of the students and thus this scenario offers developmental opportunities.

The impact of critical digital literacy abilities of staff and students on learning opportunities is shown in Figure 4.3. Interestingly, the representation offer insights for enhancement and for students to support and develop staff. It resonates with the increasing emphasis placed upon student engagment and the implications for staff and students to work as partners. In the example shown in Figure 4.3a, it is possible to see that, where the critical digital literacy ability of staff is greater than that of the students, the opportunity for student critical digital literacy development is increased (a) and the risk that staff will not be able to support students is reduced. Conversely, if the level of the students is greater than that of the staff, student development opportunities are reduced, whilst the
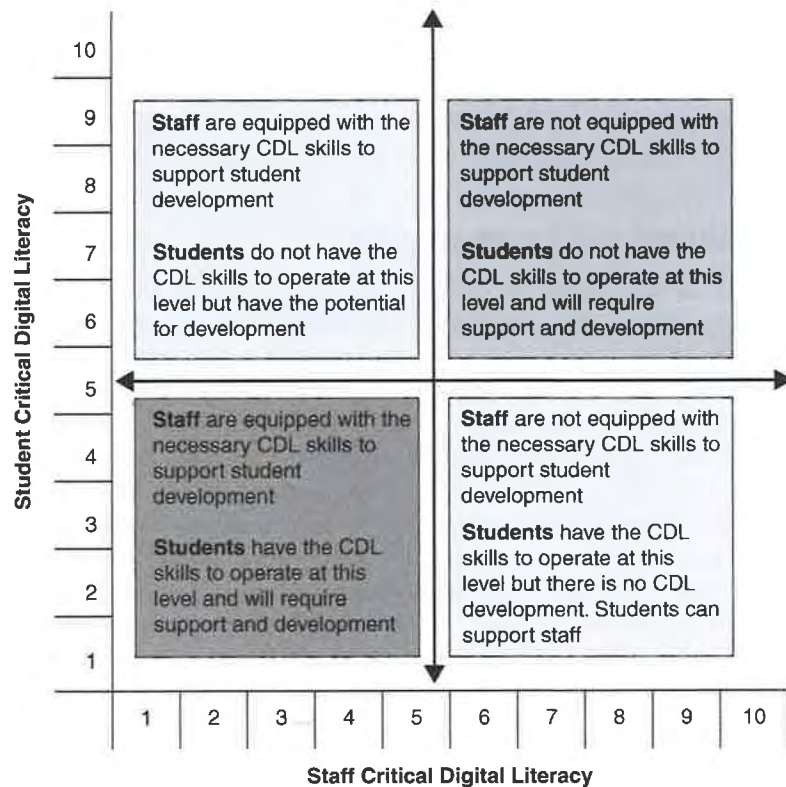
FIGURE 4.2 Quadrant model of staff/student CDL

The model (shown in Figures 4.2, 4.3a and 4.3b) is an effective representation of how different levels of critical digital literacy levels of staff and students can impact learning and teaching development opportunities, but it does not yet take into account the learning design itself. Indeed, the development of student digital literacy as part of Learning Design theory requires the knowledge of three core elements: student critical digital literacy capability, staff critical digital literacy capability as indicated by their practice and the design itself. The critical digital literacy of staff and students, as well as the critical digital literacy required within the learning design itself, therefore needs to be quantified. The proposition that staff and student digital literacy be quantified by means of the same critical digital literacy scale and the results applied to individual learning designs would give teachers confidence that the chosen design would function at their own and their students' level of practice. Furthermore, this quantification would permit practitioners to visualize the development of critical digital literacy within a learning design for their students. Translating this into a model of Digital Literacy Learning
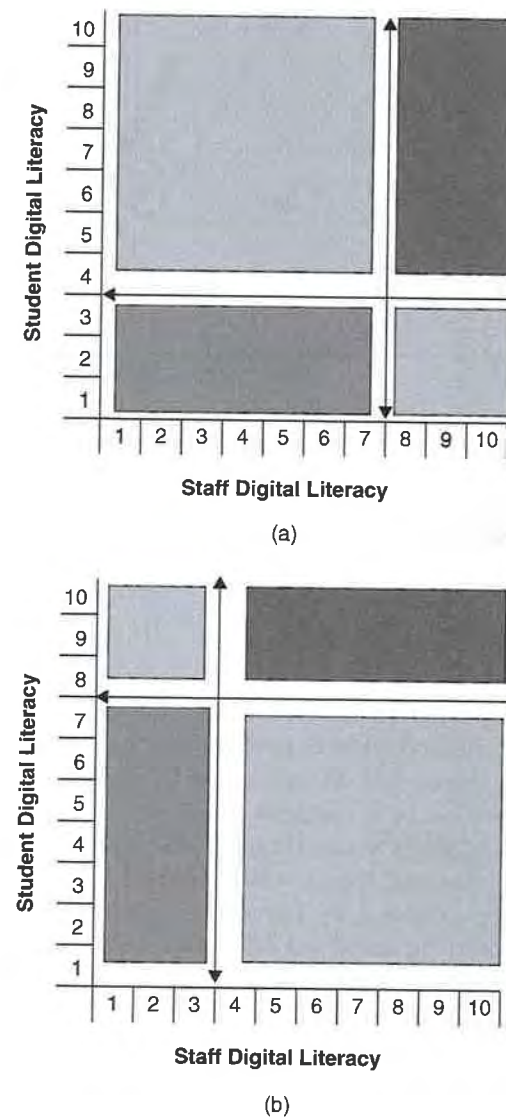

(a)

(b)

FIGURE 4.3 Impact of changes in staff/student CDL on learning potential

Design (DLLD; Figure 4.4) allows us to link the critical digital literacy levels of staff and students with learning designs.

In this representation, anything to the right of the dotted line is above the students' critical digital literacy ability and anything to the left is below. For staff, anything to the right of the dashed line is above their critical digital literacy
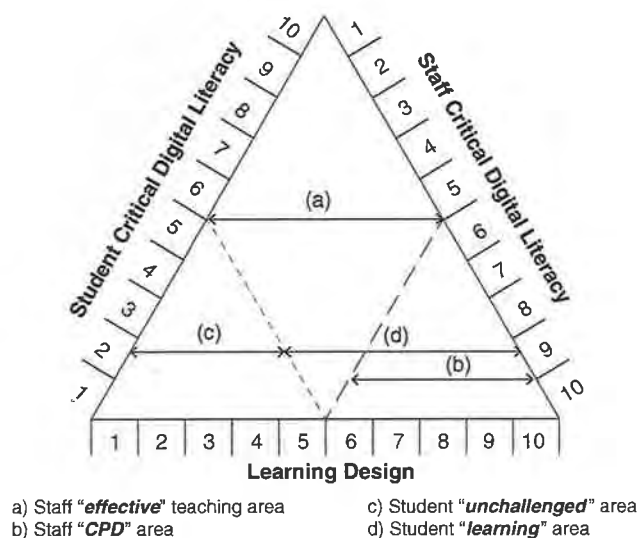
a) Staff *"effective"* teaching area   c) Student *"unchallenged"* area
b) Staff *"CPD"* area   d) Student *"learning"* area

FIGURE 4.4 Visualizing staff and student digital literacy

ability and anything to the left is below. Visually, one is able to apply a series of intersects to each side of the DLLD model, which form areas that represent a range of scenarios (Figure 4.5). In these examples, the impact of critical digital literacy development can be envisaged in situations where: (1) staff and students have an equal critical digital literacy (Figure 4.5a); (2) students have greater critical digital literacy than staff (Figure 4.5b); (3) staff have greater critical digital literacy than students (Figure 4.5c). The outcomes of these will then inform the application of the learning design and the suitability for staff and students. Additionally, the model offers insight into where staff development is needed or, interestingly, where students, working as agents[4] or partners of change, can offer staff enrichment.

The vertices on the DLLD model create a series of sections, which describe different learning situations and implications for staff and student engagement with critical digital literacy (Table 4.2). If (a)>(c), then staff have the capacity and skill to enhance their students' critical digital literacy, whereas if (a)<(c), staff have the capacity to work only at the critical digital literacy level that students are comfortable with but not challenged by, assuming they have the critical digital literacy level themselves. Situations (b) and (d) indicate a potential to increase staff and student capabilities for critical digital literacy, either through professional development activities (staff), or via the successful delivery of a learning design (student). Situation (e) is a collaborative zone where students, given the correct opportunities, can enhance staff critical digital literacy, or staff have the critical
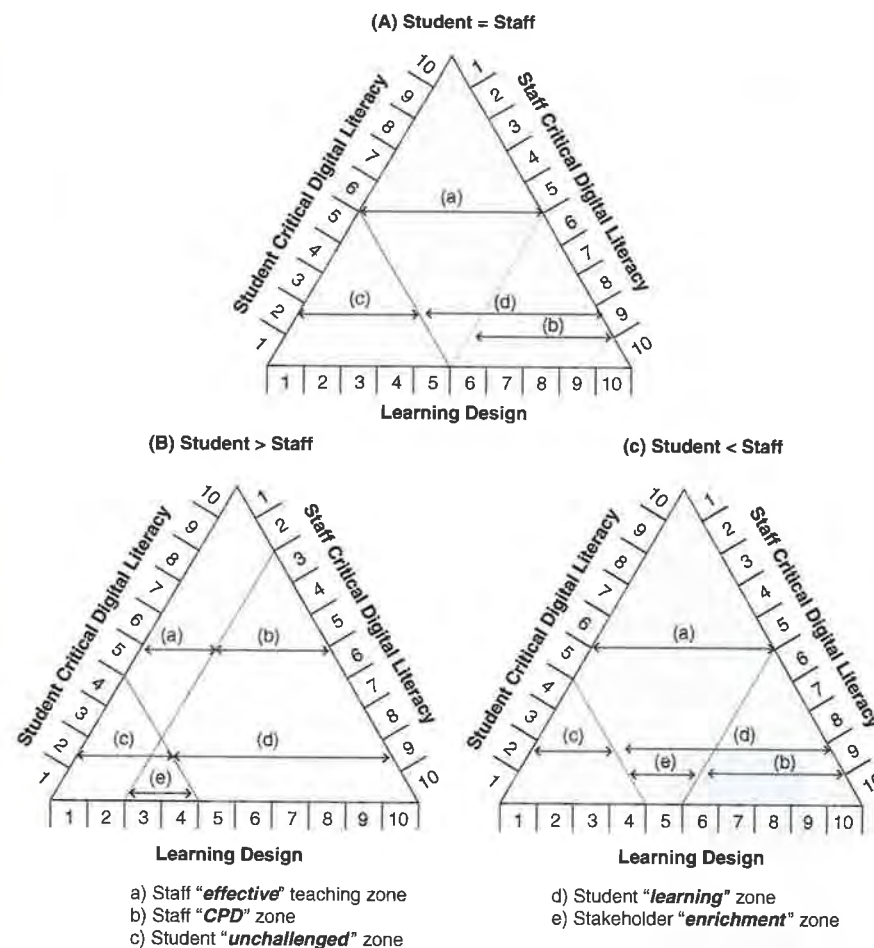

a) Staff *"effective"* teaching zone   d) Student *"learning"* zone
b) Staff *"CPD"* zone   e) Stakeholder *"enrichment"* zone
c) Student *"unchallenged"* zone

FIGURE 4.5 Examples of the DLLD model in relation to staff/student CDL

TABLE 4.2 DLLD model. The vertices in the DLLD model create a series of areas, each of which have an impact on the staff and student engagement and the capacity for staff to support student CDL.

Area	Name	Observation
(a)	Effective staff teaching	Indicates the area whereby staff have the CDL skill to deliver a learning design
(b)	Staff CDP	Indicates the area where staff have the capacity to undergo future CPD to increase their CDL skill
(c)	Student unchallenged	Indicates the area where any applied learning design does not enhance students' CDL skill
(d)	Student learning	Indicates the area where any applied learning design has the potential to enhance students' CDL skill
(e)	Stakeholder	Indicates the area where either the staff or student has the

The Application of Digital Literacy to Learning Design

Whilst the relationship between student and staff capacity for critical digital literacy is essential to ensure its development, it does not provide an insight into the potential effectiveness or the difficulties of a learning design. It is therefore necessary to review and quantify a learning design at a *session* level of granularity. To highlight this, one can use the example of the learning design applied to the role play featured in the Larnaca Declaration (See Chapter 1). Traditionally, the teaching of role play is a face-to-face activity where students, in this example a group of trainee teachers, are given roles to play and, following discussion and/or research to develop their roles, enact the role play. This learning design is used successfully in many educational settings, including teaching, management and medical education (Nestèl & Tierney, 2007), and has significant potential to develop critical digital literacy. Conceptually, one can apply a transitional approach to role play to support the development of critical digital literacy through the introduction of digital technology by accepting the premise that there are alternatives to face-to-face engagement (Figure 4.6). Here students can receive the roles via a variety of digital modes and then work in groups to *Decode* and *Make Meaning* of
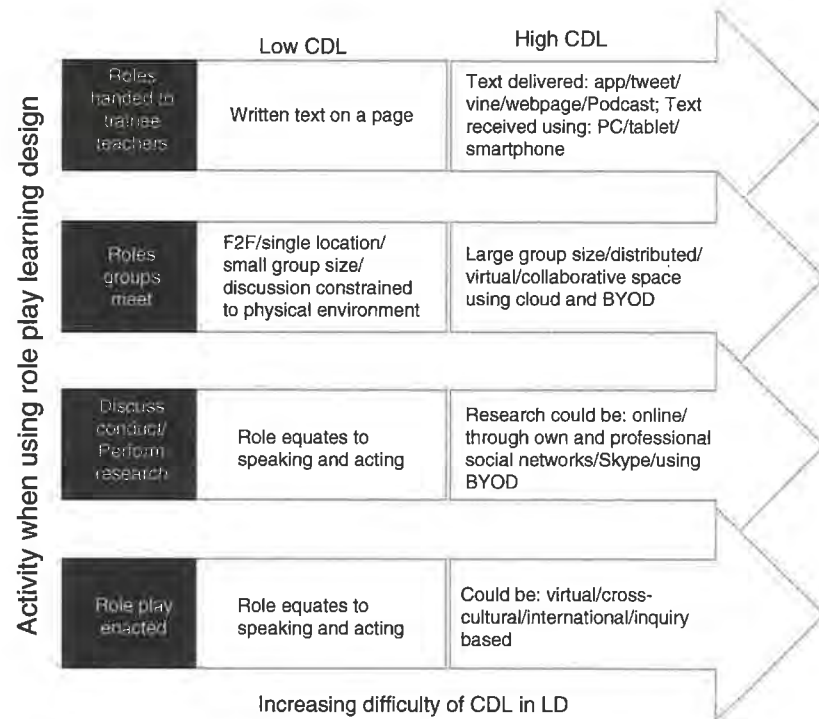
the technology and the instructions. In the critical digital literacy model (Hinrichsen & Coombs, 2014), students work in groups to *Analyze* and *Use* the technology to explore/research the role and engage with digital technology to present the role, thus developing the *Persona* dimension. The learning design therefore has the potential to develop critical digital literacy and is dependent on both the technology and the critical digital literacy applied to the technology for both staff and students.

Having explored an example of a specific learning design and how it can be adapted to require different levels of digital literacy, we are now in the position to explore the level of critical digital literacy in a learning design (Figure 4.7), and thus explore the relationship between staff and student capabilities, and the learning design at a session level. Here, we can model the optimal application of a learning design to ensure the development of student critical digital literacy whilst also ensuring that staff have the capability to deliver this. For example, a learning design at level 5[5], represented by the thick black line, requires staff of equal or greater critical digital literacy to teach it, and students above or below, depending on the learning intended. If students are above this level, there will be no critical digital literacy development; if below, they will require support from staff, but may reach the level of the learning design at the end of the design. It could be argued that, if a learning design requires a critical digital literacy level greater than that of the practitioner, it could spur that person to undertake CPD in critical digital literacy or, alternatively, as s/he prepares for the lesson, her/his critical digital literacy may further develop.
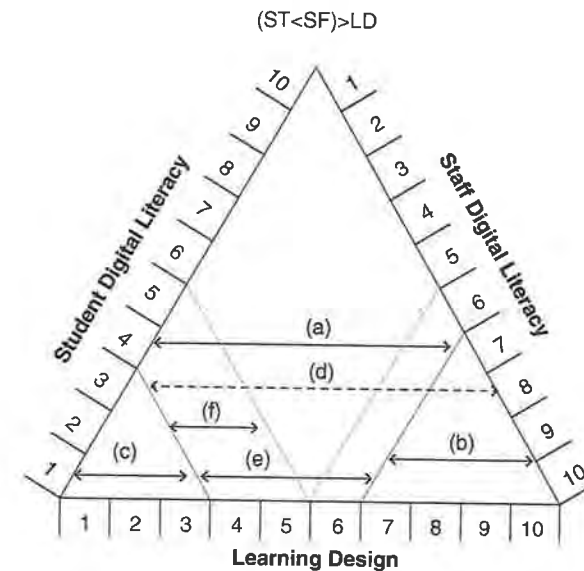

FIGURE 4.6 The integration of CDL in the role play teaching methodology

FIGURE 4.7 Applying the CDL of a learning design to the DLLD model
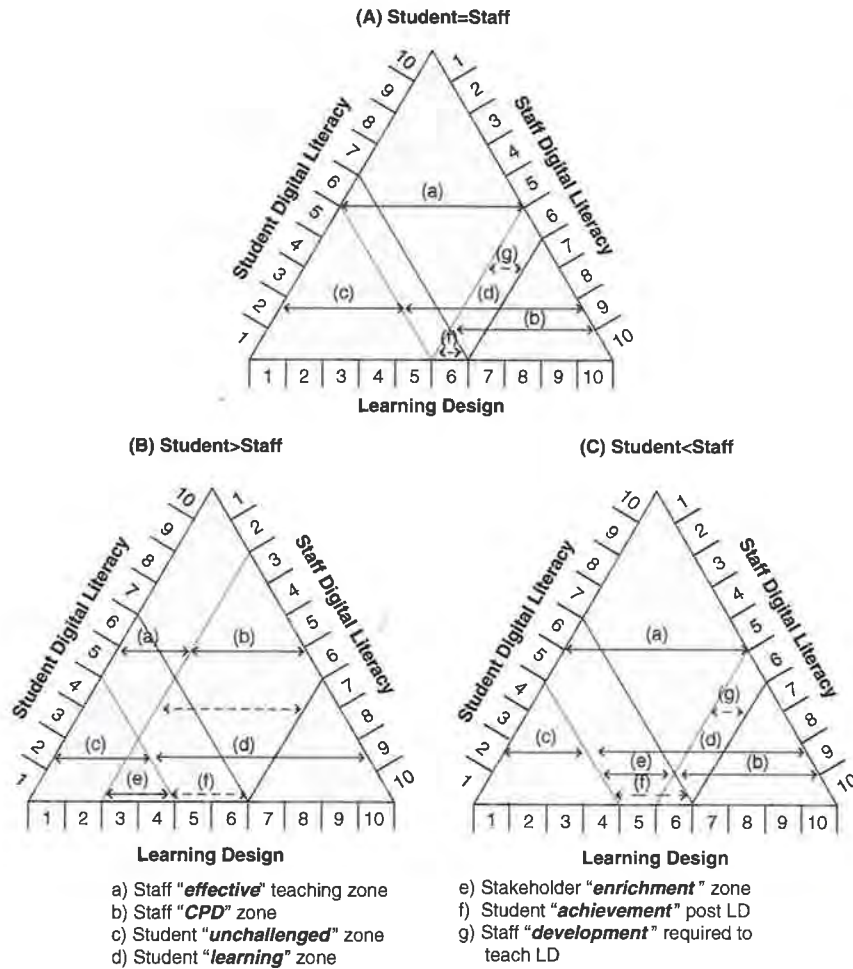
FIGURE 4.8 Applying the CDL of a learning design to the DLLD model

a) Staff "*effective*" teaching zone
b) Staff "*CPD*" zone
c) Student "*unchallenged*" zone
d) Student "*learning*" zone

e) Stakeholder "*enrichment*" zone
f) Student "*achievement*" post LD
g) Staff "*development*" required to teach LD

TABLE 4.3 DLLD aligned to critical digital literacy of a learning design. The vertices in the DLLD model create a series of areas, each of which have an impact on the staff and student engagement with CDL and the delivery of a learning design.

Zone	Name	Observation
(a)	Staff effective teaching zone	Indicates the area whereby staff have the CDL skill to deliver a learning design
(b)	Staff CDP zone	Indicates the area where staff have the capacity to undergo future CPD to increase their CDL skill
(c)	Student unchallenged zone	Indicates the area where any applied learning design in this zone will not enhance the students' CDL skill
(d)	Student learning zone	Indicates the area where any applied learning design in this zone has the potential to enhance the students' CDL skill
(e)	Stakeholder enrichment zone	Indicates the area where either the staff or student has the potential to enhance the CDL of the other
(f)	Student achievement post learning design	Indicates the level of increase in student CDL following the successful completion of the learning design
(g)	Staff development required to teach learning design	Indicates the required CPD to deliver the learning design

The introduction of critical digital literacy quantification to Learning Design introduces new areas into the model and provides a representation of the relationship between the learning design and staff and student critical digital literacy development (Figure 4.8; Table 4.3). Combined, it is now possible to relate a learning design to the students it is intended for and to the practitioner who will be delivering it. Importantly, the two additional zones describe, where applicable: (1) an increase in student critical digital literacy following the successful engagement with a learning design, indicated by (f); and (2) the degree of staff continuing professional development (CPD) required to deliver that particular learning design, indicated by (g). At the holistic level, the model will provide the necessary confidence and reassurance for students to engage in a session and not feel excluded on account of their lack of critical digital literacy.

Whilst these visualizations are useful, they have limited scope for understanding situations and take time to construct. Mathematically, one can construct a series of scenarios to explore these relationships in greater detail (Table 4.4) and begin to deconstruct the processes required for the application of a learning design to support the development of student critical digital literacy. These logic statements will permit the construction of models to predict and demonstrate the effectiveness of numerous real scenarios. These scenarios permit the prediction of the student and staff experience, and how the learning design will impact student transition. This gives rise to the optimal teaching condition needed to develop critical digital literacy—$(ST<LD)\le SF$—and highlights immediate areas of risk—$(ST\le LD)\ge SF$—as well as areas of opportunity—$(ST\ge LD)\ge SF$.

Having reviewed a possible model to link the development of critical digital literacy, staff professional development and Learning Design, it is important to look at how this model could be applied to practice. The basis of the model is the quantification of critical digital literacy for the individual and for the learning design. For the model to work, the same criteria need to be applied to staff and students, as well as to the design itself. The subject of quantifying digital literacy is complex and, to date, numerous models have been proposed. One such model is the result of Bath University's PriDE[6] project. Here, they use the Functional Skills,

TABLE 4.4 DLLD Logics statements. The intersects in the DLLD model create a series of areas, each of which have an impact on the staff and student engagement with critical digital literacy and the delivery of a learning design. Learning in areas other than CDL may take place.

Logic	Student (ST)	Staff (SF)	Learning Design (LD)
(ST=SF)=LD	No intended development. Learning is static	Teaching is static	CDL level static and offers no learning development
(ST=SF) >LD	Wasted potential for development	Wasted potential for development	CDL level too low. Offers no clear development
(ST=SF)<LD	Wasted potential for development	Unable to develop students' CDL	CDL level too high. Risk of confusion and disengagement
(ST≥LD) >SF	Wasted potential for student development. Potential enrichment of staff	Learning potential through students. Unable to develop students.	CDL level too low. Offers no student development but possibility for staff development
(ST<LD)>SF	Potential for disengagement	Unable to develop students' CDL	CDL level too high. Risk of confusion and disengagement
(ST≤LD)≤SF	Engaged. Potential enrichment of students' CDL	Supports student development	CDL level pitched correctly

Practices and Attributes taxonomic approach, building an identity for each core discipline, which has the potential to be numerically quantified. The University of Exeter's Cascade project[7] has developed an online questionnaire that explores the digital learner profile, visualizing ability in eight core areas: (1) Global Citizen, (2) Information Junkie, (3) Learner Networker, (4) Career Building, (5) Digital Enthusiast, (6) Digital Sceptic, (7) Media Savvy and (8) Life Planner. From the perspective of applying the model to the development of critical digital literacy, the scale could be as simple as *low* to *high* or as complex as a numerical grading system. What is important is that the scale is consistently applied to staff, students and the learning design.

Putting into Practice

The model offers multiple opportunities to support the successful integration of critical digital literacy within a learning design at different levels of granularity[8] and also resonates with the larger picture that the Larnaca Declaration provides. With these combined, it is therefore possible to construct a set of practice suggestions to support the alignment of Learning Design and critical digital literacy:

1. The institution has a transparent process for the development of critical digital literacy as part of a teaching, learning and assessment strategy.

2. The institution subscribes to a process for continuous monitoring, reflection and enhancement of critical digital literacy evidenced in annual monitoring.
3. Commitment from all programme teams to develop student critical digital literacy and embedded in programme documentation.
4. All programme teaching activities are rated for their critical digital literacy requirement and content.
5. At the programme level, all teaching, learning and assessment material is ordered and aligned to support student critical digital literacy development.
6. Staff and students can rate their critical digital literacy ability on an institutionally agreed framework.
7. CPD provision is in place to develop staff critical digital literacy and staff are never asked to teach above their critical digital literacy level.
8. Students and staff can engage in additional critical digital literacy support as required.
9. Students are involved in programme critical digital literacy development, as part of design and validation.
10. Future employers are engaged throughout programme design to ensure alignment of critical digital literacy with professional practice.

Conclusion

This chapter has focussed on the importance of embracing digitally enhanced Learning Design as a means to improve students' ability to thrive in the digital age, and to improve the capability of staff to teach in a technological world they did not grow up in. It has introduced two models to explore the relationship between staff and student digital literacy and how this relates to successful Learning Design. The authors have discussed the effectiveness of an individual learning design and, by extrapolation, how multiple learning designs could be constructed to develop student critical digital literacy at the holistic level. Applying this at a higher level of granularity would offer a robust methodology that could be used to inform and address numerous institutional priorities. As an example, if an institution embraced a practice of "bring your own device" (BYOD), the DLLD model could provide a framework to identify learning designs, staff capabilities and student risk factors, thereby impacting the success of the BYOD initiative. Specifically, this model could be used to identify a sequence of learning designs that will ensure successful BYOD student engagement. This will be supported by staff known to have the capabilities to deliver and develop the critical digital literacy required for BYOD, and thus help to prevent the disengagement, attrition and failure often associated with poorly designed technological implementations. A second example could be the need for institutions to support their graduates' employability within specific programmes. Here, having identified the critical digital literacy required by employers, learning designs

or adapted to ensure alignment, and thus equip students with the necessary critical digital literacy to succeed. Importantly, this model will ensure both that staff have confidence that students will be able to engage with the newly constructed designs and that staff are equipped to deliver within them.

Notes

1 The aims of the STELLAR Network are to build capacity into TEL research within Europe to allow the European Union to achieve its goals via the Bologna Agreement and the execution of the Lisbon Agenda.
2 See for example www.sconul.ac.uk/tags/digital-literacy/.
3 Other components that make up the critical digital literacy framework can be viewed at: https://sites.google.com/site/dlframework/home/background.
4 www.changeagentsnetwork.co.uk
5 Note that this is an example based on the quantification of critical digital literacy on a scale from 1 to 10.
6 http://digilitpride.wordpress.com
7 http://blogs.exeter.ac.uk/cascade/
8 See Larnaca Declaration for an explanation of the term "granularity".

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