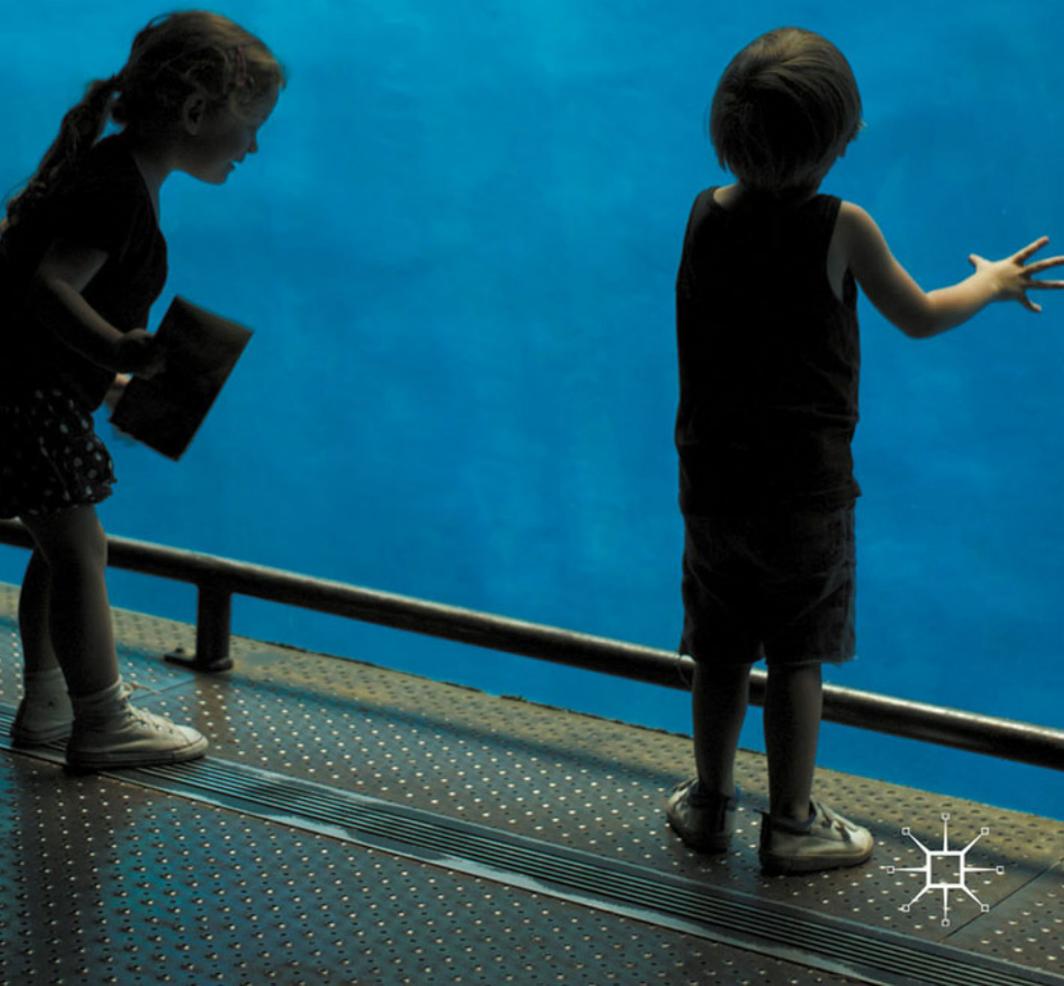


A PEDAGOGY OF MULTILITERACIES

LEARNING BY DESIGN

Edited by Bill Cope and Mary Kalantzis



A Pedagogy of Multiliteracies

Also by Bill Cope

THE FUTURE OF THE ACADEMIC JOURNAL (*co-editor*)

Also by Bill Cope and Mary Kalantzis

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NEW LEARNING

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MULTILITERACIES

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A Genre Approach to Teaching Writing (*co-editors*)

A Pedagogy of Multiliteracies

Learning by Design

Edited by

Bill Cope and Mary Kalantzis

University of Illinois, USA

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Summary: "The term 'Multiliteracies' was coined in 1994 by the New London Group, a group of scholars who came together to consider the current state and possible future of literacy pedagogy. In the subsequent years, the influence of the idea has been greater than the members of the group could ever have imagined. In this collection, two of the original members of the group, Bill Cope and Mary Kalantzis, have brought together a representative range of authors, each of whom has been involved in the application of the pedagogy of Multiliteracies, in settings as broadly dispersed as Australia, Canada, Greece, Malaysia, Italy, Japan, South Africa and the United States. The chapters capture vivid narratives of school experiences and offer insights into the role of the new, digital media platforms such as online lesson planning, resource development, and classroom delivery, making this book an invaluable resource for Multiliteracies practitioners and researchers alike!"—Provided by publisher.

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Notes on Contributors

Sandra Schamroth Abrams is an associate professor in the Department of Curriculum and Instruction at St. John's University in New York, USA. Her research of digital literacies and videogaming provides insight into agentive learning, layered meaning-making, and pedagogical discovery located at the intersection of online and offline experiences. Her recent work appears in the *Journal of Adolescent & Adult Education*, *Journal of Literacy Research*, and *Educational Media International*. She is author of *Integrating Virtual and Traditional Learning in 6-12 Classrooms: A Layered Literacies Approach to Multimodal Meaning-Making*.

Eugenia Arvanitis is an assistant professor in the Department of Educational Science and Early Childhood Education at the University of Patras, Greece, on issues of *Interculturality & Otherness in Education*. Arvanitis has lived for a decade in Australia gaining valuable experience in intercultural education and ethnic language maintenance policies and practices. She is Research Partner of the Common Ground & Learning by Design project team and a teachers' professional learning framework for school-based training trialling the *Learning by Design* approach. She is also the author of several research papers and one book, *Greek Ethnic Schools in Australia in the Late 1990s: Selected Case studies*. Arvanitis is the co-editor of three books: *Memories of Bonegilla: Recollections of an Insider*, *New Learning: Elements of a Science of Education*, and *Intercultural Mediation in Europe: Narratives of Professional Transformation*.

Shanthi Balraj Baboo is an associate professor at the School of Arts, Universiti Sains Malaysia, Penang, Malaysia. She has conducted research on new media literacy, youth media and is working on a project that aims to cultivate productive media practices among Malaysian students in secondary schools. She is keen in adopting the *Learning by Design* model in developing learning modules on media literacy for Malaysian schools.

Murray Bruce has taught in elementary schools in New Zealand and in various Australian States and Territories. He has extensive experience in school leadership, having served as principal of five schools, and on the executive of the Lanyon Cluster of Schools. Bruce is also keenly interested in applying the ideas of Total Quality Management in educational settings, particularly where the focus is on personalised learning, optimising student ownership, and ensuring quality learning for every student.

Anne Cloonan is Coordinator of Language and Literacy Education at Deakin University, Australia. With a preference for working in collaborative

partnerships with teachers, students and parents, her qualitative and mixed methods research explore complexities of literacy education in the digital age. Cloonan's projects include: literacy education in one-to-one contexts (Department of Education and Early Childhood Development Victoria); e-literature in classrooms (Deakin University); the impact of professional learning on literacy teachers and learners (Catholic Education Office); innovative learning environments (Organisation for Economic Cooperation and Development); Asia literate teaching (Asia Education Foundation/Australian Institute for Teaching and School Leadership); Intercultural Understanding in Schools (Australian Research Council); Creative, Critical, Digital: Connecting home and school literacies (Catholic Education Office Melbourne).

Bill Cope is a professor in the Department of Educational Policy Studies at the University of Illinois, USA. He is Principal Investigator in a series of major projects funded by the Institute of Educational Sciences in the US Department of Education and the Bill and Melinda Gates Foundation researching and developing multimodal writing and assessment spaces. From 2010 to 2013 he was Chair of the Journals Publication Committee of the American Educational Research Association. His recent books include *The Future of the Academic Journal* (with Angus Phillips, eds) and *Towards a Semantic Web: Connecting Knowledge in Academic Research* (with Kalantzis and Magee).

Marion Drew, at the time of writing the chapter in this book, was a lecturer in the Department of Audiology, University of the Witwatersrand, Johannesburg, South Africa. She runs "Paleng" (place of stories), a children's centre in a village in rural Lesotho. Her interests are emerging literacy, children's stories as a support for early literacy acquisition and the interaction between text and image in children's picture books. "Paleng" is also a pilot site for the African Storybook Project which aims to provide context-appropriate reading material in mother tongue Sesotho for children at the emerging literacy stage across Africa (www.africanstorybook.org).

Prue Gill is Executive Teacher of Professional Practice at Lanyon High School, Canberra, Australia. She works closely with teachers as a coach and a mentor, focusing on pedagogy, particularly on implementing *Learning by Design* and Scholar in the classroom. Her interests include English, literacy and technology in education.

Shane Gorman is Principal of Bonython Primary School, Canberra, Australia. He has worked in a variety of educational settings including elementary, secondary and an outdoor education centre. His current work is leading learning methods and structures to improve outcomes in literacy and numeracy through individualised learning targets for every student.

Sue Gorman is a literacy and numeracy coach, working at Gordon Primary School, Canberra, Australia. She has extensive classroom teaching experience

in elementary and secondary settings. Formerly a Reading Recovery teacher and Quality Teaching coordinator, she now spends her working day coaching other teachers to build their capacity to make a difference for every child in literacy and numeracy.

Peter Henry has more than 30 years' experience in Australia and internationally as an educator and curriculum consultant. He has also had 15 years' experience as an educational leader in settings ranging from a small rural school to schools of 400 students. In 2001, he was awarded both the Australian Excellence in Teaching Award and the National Excellence in Teaching Award. Henry was a foundation member of the Lanyon Cluster of Schools and still works closely with the cluster.

Kathryn Hibbert is Associate Professor of Adolescent Literacy and English Language Arts at the Faculty of Education, Western University, London, Canada. She is also a centre researcher at the Centre for Education Research and Innovation at the Schulich School of Medicine & Dentistry. Her research explores new literacies practices in interdisciplinary settings including schools, clinics, and communities. Her most recent co-edited book is *Negotiating Literacy Learning: Multimodality and Governmentality*.

Denice Ward Hood is an assistant professor in the Department of Education Policy, Organization & Leadership in the College of Education at the University of Illinois, Urbana-Champaign, USA. She is an affiliated faculty with the Center for Culturally Responsive Evaluation and Assessment at the College of Education. Hood's research interests include program evaluation and student learning outcomes assessment. Her work also involves exploring teaching and learning in online environments.

Luigi Iannacci is an associate professor in the School of Education and Professional Learning at Trent University, Canada where he coordinates and teaches Primary/Junior language and literacy and special needs learners' courses, as well as the Intermediate/Senior drama course. Iannacci is the co-editor (with Pam Whitty, UNB) of *Early Childhood Reconceptualist Perspectives* (2009) and co-author (with Rachel Heydon) of *Early Childhood Curricula and the De-Pathologizing of Childhood* (2008).

Mary Kalantzis is Dean of the College of Education at the University of Illinois, Urbana-Champaign, USA. She was formerly Dean of the Faculty of Education, Language and Community Services at RMIT University in Melbourne, Australia, and President of the Australian Council of Deans of Education. She is co-author (with Bill Cope) of *New Learning: Elements of a Science of Education and Literacies*; and co-editor (with Bill Cope) of *Ubiquitous Learning*.

Robyn Kiddy is Deputy Principal at Bonython Primary School, Canberra, Australia. She has worked as a classroom teacher for 15 years in Victorian

and ACT schools. Robyn's main focus is to build teachers' capacity in teaching literacy and numeracy through a coaching and mentoring model, embedding cooperative structures and formative assessment strategies to increase both student engagement and accountability, and to improve learning outcomes for all students.

Pierpaolo Limone is Associate Professor of Media Education at the Department of Humanities, University of Foggia, Italy. His scientific work is primarily concerned with applied research in the area of digital media and education. Founder and director of the laboratory for "Educational Research and Interaction Design" (ERID Lab) of the University of Foggia, he coordinates a team of researchers and designers working on projects and services related to digital educational environments. He is a founding member of SIREM (Italian Society for Research on Media Education), for which he served as National Secretary until July 2012. Among his most recent publications related to learning innovation and digital environments: *Ambienti di apprendimento e progettazione didattica. Proposte per un sistema educativo transmediale; Educazione, scuole e musei. Un progetto collaborativo di innovazione didattica* (ed.); *Media, tecnologie e scuola* (ed.).

Kathy A. Mills is Senior Research Fellow (Australian Research Council) of literacy at the Queensland University of Technology, Australia. Her research publications address multimodality, digital composition, literacy, race, and social disadvantage. Mills is Associate Editor of the *Australian Educational Researcher*. She serves on the editorial review board of the *Journal of Literacy Research*. She is the treasurer of the American Educational Research Association, Writing and Literacies SIG, next Program Chair and future Chair, and serves on the Review Board of the *Australian Journal of Language and Literacy*. Mills also serves on the review board of the *The Reading Teacher*, International Reading Association, New Jersey, USA.

Walkyria Monte Mór is an associate professor at the University of São Paulo, Brazil, and an adjunct researcher at the Center for Globalization and Cultural Studies, University of Manitoba, Canada. She co-directs the National Project for Teacher Education in Brazil "Literacies, Multiliteracies and the Teaching of Languages," aiming to broaden relationships and engagement between State and Federal Universities and Public Schools. Her recent research focuses on: new literacies, multiliteracies, critique and meaning-making, critical pedagogy, teacher education. She is co-author of the *National Curriculum Orientations for the Secondary Schools: Foreign languages* (English), published by the Brazilian Ministry of Education in 2006 (Orientações Curriculares Nacionais para o Ensino Médio: Línguas Estrangeiras, MEC/2006).

Mary Neville is an Australian educator who has worked as a classroom teacher, researcher, professional development provider, curriculum manager and director in both government and university sectors. Her areas of

expertise in education include the teaching of literacy in the curriculum (including multimodal literacy) from Prep to Year 12, quality standards-based assessment design and the alignment of assessment, curriculum planning and pedagogy for whole school, year level and individual classroom contexts.

Mary Ott is an elementary teacher with the Thames Valley District School Board based in London, Ontario, Canada. She is conducting master's thesis research on teachers' use of video in making formative assessments of literacy.

Rosaria Pace is a research fellow in Media Education in the Department of Humanities, University of Foggia, Italy. Her scientific work is primarily concerned with theoretical and applied research on digital learning environments for formal and informal learning contexts. Digital Humanities is the umbrella theme she is investigating in her current research projects. A member of SIREM (Italian Society for Research on Media Education), she is Vice-President of the spin-off enterprise TINADA, and a team member of research projects related to ICT and learning innovation.

Ambigapathy Pandian is a professor at the School of Languages, Literacies and Translation, Universiti Sains Malaysia, Penang, Malaysia. His main research areas focus on literacy, reading, higher education and multiculturalism, especially researching on action projects that engage teachers as change agents. He has completed a project on developing a literacy index for Malaysian schools. He has recently co-authored two books, *Language Teaching and Learning: New Dimensions and Interventions* and *Multiliteracies in Education: Forms of Literacy in English in Schools in Malaysia*.

Luke Rowland is an assistant professor in the Department of English at Doshisha University, Kyoto, Japan. His research interests include social semiotic enquiry, linguistic landscapes, and Multiliteracies pedagogy. His current focus is the use of English in the linguistic landscape of Japan.

Kathleen Stoop has worked as an audiologist in South Africa, New Zealand and Australia. She has experience in a variety of settings, including tertiary education, diagnostic and rehabilitative audiology and management. From 2002 to 2006, Stoop worked as a lecturer and clinical educator in the Discipline of Audiology at the University of the Witwatersrand in South Africa.

Rita van Haren is a curriculum resource developer at Common Ground Publishing, curating material and creating learning designs in Scholar. From 2004 to 2013, Rita worked with teachers and leaders in the Lanyon Cluster of schools, focusing on curriculum and pedagogy. She has had policy and leadership roles in the Australian Capital Territory Department of Education as a literacy consultant, and has over 30 years' experience in education,

including more than 20 years as a classroom teacher in elementary and high schools.

Chryssi Vitsilaki is Professor and Chair of the Department of Pre-School Education and Educational Design of the University of the Aegean, Rhodes, Greece. She is also the Director of the Department's post-graduate program "New Forms of Education and Learning" and has, for the past ten years been Director of the post-graduate program "Gender and New Educational and Employment Environments in the Information Age" – the only master's program in Greece offered through e-learning, and which received the European Commission's "2009 Award for Quality in e-Learning." Her academic work has focused on the issues of gender and new forms of education, new pedagogies and the role of technology in learning processes, on which she has published 10 books and some 50 articles. She has served as elected Dean of the School of the Humanities for a two-year term and also as elected Vice-Rector of Finance and Development for a four-year term, at the University of the Aegean.

Nicola Yelland is a research professor in the School of Education at Victoria University in Melbourne, Australia. Over the last decade her teaching and research has been related to the use of new technologies in school and community contexts. This has involved projects that have investigated the innovative learning of children, as well as a broader consideration of the ways in which new technologies can impact on the pedagogies that teachers use and the curriculum in schools. She is the author of *Shift to the Future: Rethinking Learning with New Technologies in Education*. Yelland is the founding editor of two journals, *Contemporary Issues in Early Childhood* and *Global Studies of Childhood*.

1

The Things You Do to Know: An Introduction to the Pedagogy of Multiliteracies

Bill Cope and Mary Kalantzis

After a brief history of the context and evolution of the idea of Multiliteracies, this chapter focuses on its pedagogy. Originally framed as Situated Practice, Overt Instruction, Critical Framing, and Transformed Practice, these four orientations were subsequently translated in the Learning by Design project into the 'Knowledge Processes' of Experiencing, Conceptualizing, Analyzing and Applying. The chapter explores the roots of these orientations in what it characterizes as 'didactic' and 'authentic' pedagogies. Learning by Design is by comparison 'reflexive', combining elements of each of these traditions into a new synthesis. The chapter goes on to spell out the pedagogical specifics of each of the Knowledge Processes, then their epistemological basis as distinctive kinds of 'knowledge-action'. We conclude by contrasting the cognitive emphases of both didactic and authentic pedagogy with the epistemological theory of learning that underpins Learning by Design. Its focus is on action rather than cognition—not what we know, but the things we do to know.

Towards a pedagogy of Multiliteracies

The short history of a word

'Literacy' is a term that presents itself as emphatic and singular. The emphatic part accompanies the modern insistence that everyone has at least 'basic' levels of competency in reading and writing. 'Literacy' in this sense means some quite definite things to be acquired: to read the ordinary texts of modern society—newspapers, information books, novels; to be able to write using correct spelling and grammar; and to appreciate high-cultural values through exposure to a taste of the literary canon. The singular part arises when literacy is presented as a single, official or standard form of language, one right way to write, and an idealized canon of authors conventionally considered 'great'.

By the mid-1990s, the emphatic and singular connotations of the term 'literacy' were beginning to work not-so-well. The mass media and then the internet spawned whole new genres of text which meant that narrowly conventional understandings of literacy were fast becoming anachronistic.

Also, the forces of globalization and manifest local diversity increasingly juxtaposed modes of meaning making that were sharply different from each other. The challenge of learning to communicate in this new environment was to navigate the differences, rather than to learn to communicate in the same ways. Besides, it was becoming obvious that traditional literacy pedagogy was not working to achieve its stated goal of providing social opportunity. Inequalities in education were growing, suggesting that something needed to be done in literacy pedagogy to address this.

It was in this context that the New London Group came together to consider the current state and possible future of literacy pedagogy. Convened by Mary Kalantzis and Bill Cope, the group also consisted of Courtney Cazden, Norman Fairclough, Jim Gee, Gunther Kress, Allan Luke, Carmen Luke, Sarah Michaels, and Martin Nakata. The group's initial deliberations—a week-long meeting in September 1994—produced an article-long manifesto (New London Group 1996), and then an edited book (Cope and Kalantzis 2000) which included the original article. In 2009, in consultation with other members of the group, Cope and Kalantzis published a paper reflecting on subsequent developments (Cope and Kalantzis 2009); then in 2012 they produced a book outlining the theory and practice in greater detail (Kalantzis and Cope 2012a).

To capture the essence of the changes that the group felt needed to be addressed, we coined the term 'Multiliteracies'. A Google search 20 years later shows 196,000 web pages that mention the word. Google Scholar says that 12,700 scholarly articles and books mention Multiliteracies. Amazon has 193 books with the word in their title. At the time, we never imagined that the idea could become this widely used.

The broader context for the Multiliteracies work was the development at the same time of the New Literacy Studies, prominently involving Brian Street (Street 1995), James Gee (Gee 1996), and David Barton (Barton 2007). The idea of Multiliteracies also represents a coming together of related ideas developed before and since by members of the New London Group: Courtney Cazden (Cazden 1983; Cazden 2001; Cazden 2006; Luke et al. 2004), Mary Kalantzis and Bill Cope (Kalantzis and Cope 2012b; Kalantzis and Cope 2015a; Kalantzis and Cope 2015b), Norman Fairclough (Fairclough 1995a; Fairclough 1995b; Fairclough 2001), Jim Gee (Gee 2003; Gee 2004; Gee 2014), Gunther Kress (Kress 2003; Kress 2009; Kress and van Leeuwen 1996), Allan Luke (Luke 1994; Luke 1996a; Luke 2008), Carmen Luke (Luke 1995; Luke 1996b; Luke and Gore 1992), Sarah Michaels (Michaels 2005; Michaels et al. 1993; Michaels et al. 2005), and Martin Nakata (Nakata 2001a; Nakata 2001b; Nakata 2007).

In short: the Multiliteracies thesis

The 'Multiliteracies' argument has three components, framed as the 'why' of Multiliteracies, the 'what' of Multiliteracies, and the 'how' of Multiliteracies.

This book is only about the ‘how’ or the pedagogy of Multiliteracies. By way of background, here is a quick summary of the first two parts of the argument.

In the ‘why’ part of the argument, we outlined the dramatic changes occurring in everyday life in the realms of work, citizenship, and identity. These changes render older practices of literacy pedagogy increasingly anachronistic. This argument is expanded in Chapter 2 of our *Literacies* book (Kalantzis and Cope 2012a), and Chapters 3 to 5 of our *New Learning* book (Kalantzis and Cope 2012c).

On the subject of the ‘what’ of Multiliteracies, we add two ‘multis’ to ‘literacies’: the ‘multi-’ of enormous and significant differences in contexts and patterns of communication, and the ‘multi-’ of multimodality. In the case of the first of these ‘multi-’s, the Multiliteracies notion sets out to address the variability of meaning making in different cultural, social or domain-specific contexts. This means that it is no longer enough for literacy teaching to focus solely on the rules of standard forms of the national language. Rather, communication and representation of meaning today increasingly requires that learners become able to negotiate differences in patterns of meaning from one context to another. These differences are the consequence of any number of factors, including culture, gender, life experience, subject matter, social or subject domain, and the like. Every meaning exchange is cross-cultural to a certain degree.

The other ‘multi-’ response to the question of the ‘what’ of Multiliteracies arises in part from the characteristics of the new information and communications media. Meaning is made in ways that are increasingly multimodal—in which written-linguistic modes of meaning interface with oral, visual, audio, gestural, tactile, and spatial patterns of meaning. This means that we need to extend the range of literacy pedagogy so that it does not unduly privilege alphabetical representations. Supplementing these, the Multiliteracies approach suggests bringing multimodal texts, and particularly those typical of the new, digital media, into the curriculum and classroom. This makes literacy pedagogy all the more relevant and engaging for its manifest connections with today’s communications milieu. It also provides a powerful foundation for synesthesia, or learning that emerges from mode switching, moving backwards and forwards between representations in text, image, sound, gesture, object, and space. A burgeoning literature has emerged in the area of multimodality, most prominently in the work of Gunther Kress (Kress 2009; Kress and van Leeuwen 1996), Theo van Leeuwen (van Leeuwen 2008), and Ron Scollon (Scollon 2001). Our own account of multimodality is to be found in our forthcoming book, *Making Sense: A Grammar of Multimodality*.

This book is about the third part of the Multiliteracies argument, the ‘how’ of a pedagogy of Multiliteracies. In the original formulations of the New London Group, the following major dimensions of literacy pedagogy

were identified: *situated practice*, *overt instruction*, *critical framing*, and *transformed practice*. In applying these ideas to curriculum practices over the past decade, we have reframed these ideas somewhat and translated them into the more immediately recognizable 'Knowledge Processes': *experiencing*, *conceptualizing*, *analyzing*, and *applying* (Kalantzis and Cope 2010). Whichever terminology is used to categorize learning activity types, the essential idea in the Multiliteracies approach is that learning is a process of 'weaving' backwards and forwards across and between different pedagogical moves (Luke et al. 2004):

- *Situated practice/experiencing*: Human cognition is situated. It is contextual. Meanings are grounded in real-world patterns of experience, action, and subjective interest (Gee 2004). One key pedagogical weaving is between school learning and the practical out-of-school experiences of learners. Another is between familiar and unfamiliar texts and experiences. These kinds of cross-connections between school and the rest of life Cazden calls 'cultural weavings' (Cazden 2006).
- *Overt instruction/conceptualizing*: Specialized, disciplinary knowledges are based on finely tuned distinctions of concept and theory, typical of those developed by expert communities of practice. Conceptualizing is not merely a matter of teacherly or textbook telling based on legacy academic disciplines, but a Knowledge Process in which the learners become active conceptualizers, making the tacit explicit and generalizing from the particular. In the case of Multiliteracies teaching and learning, overt instruction/conceptualizing involves the development of a metalanguage to describe 'design elements'.
- *Critical framing/analyzing*: Powerful learning also entails a certain kind of critical capacity. 'Critical' can mean two things in a pedagogical context—to analyze functions, or to be evaluative with respect to relationships of power (Cazden 2006). In the case of a pedagogy of Multiliteracies, this involves analyzing text functions and critically interrogating the interests of participants in the communication process.
- *Transformed practice/applying*: This entails the application of knowledge and understandings to the complex diversity of real-world situations. In the case of Multiliteracies, this means making texts and putting them to use in communicative action.

The evolution of this pedagogical framework has occurred through a number of stages. A significant focal point in this evolution has been the *Learning by Design* project. This project commenced in Australia in 2000 when we were at RMIT University in Melbourne, with the support of a series of grants from the Australian Research Council. As part of this project, we developed a Microsoft Word lesson documentation template in which teachers

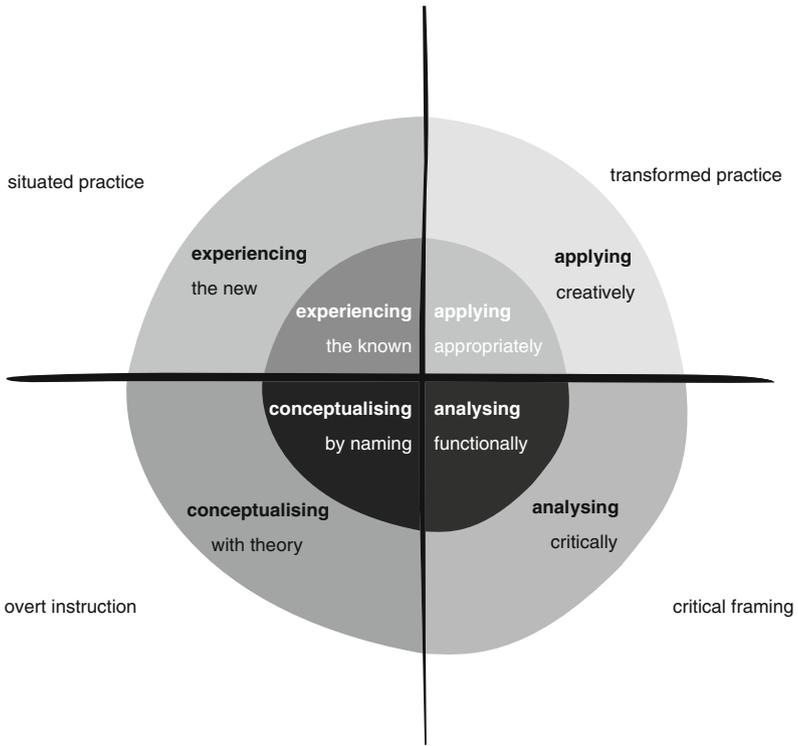


Figure 1.1 Mapping the original Multiliteracies pedagogy against the 'Knowledge Processes'

collaboratively mapped out teaching plans around the activity types identified by the Knowledge Processes, taught to these plans, revised them based on their teaching experience, and shared them as a lasting record of their pedagogical experiences. Since we moved to the University of Illinois in 2006, we have received a number of grants to continue this work from the Institute of Educational Sciences in the US Department of Education and the Bill and Melinda Gates Foundation. In 2008–2010, we created a new online web planner in which many hundreds of Learning Modules were created in the US, Australia, and Greece. Then, with the development of our *Scholar* online learning platform since 2010, Learning Module development and publication has moved there. This book includes the work of colleagues who have been engaged in the Multiliteracies pedagogy since the beginning of the *Learning by Design* project, as well as others who have come to explore the pedagogy more recently.

Figure 1.2 Learning Modules in the Scholar Bookstore (www.cgscholar.com)

The question of pedagogy

Mass-institutionalized schooling is a relatively new thing in human history. As a social project, it is barely a century and a half old, and to the extent that not every child goes to school, still incomplete. While its visible manifestations (school buildings and classrooms, teachers and students, curriculum plans and learning resources) are ubiquitous, its underlying pedagogies have been a source of continuous dispute. For the sake of argumentative clarity in this chapter, we name the two poles in the dispute ‘didactic pedagogy’ and ‘authentic pedagogy’. Elsewhere in our writings, we make some finer distinctions (Kalantzis and Cope 2012a: Part B; Kalantzis and Cope 2012c: Chapters 2, 8), but for the purposes of this chapter, we characterize these two, archetypical positions. We do this in order to characterize Multiliteracies or *Learning by Design* pedagogy as ‘reflexive’—neither didactic nor authentic, but both. When both come into play, each of the constituent parts and the whole becomes something different.

Didactic pedagogy

'Didactic' in English carries semantic loadings that it does not carry in other languages, where 'didactics' is a neutral term equivalent to 'curriculum', 'instruction', and 'pedagogy' in English. When we use the word 'didactic', we use it to capture some of its peculiar connotations in English. It means to be told things rather than to find them out for yourself. It positions the teacher as an authority figure and the student as a beneficiary of the knowledge they convey. It involves the transmission of knowledge from the knowing expert to the as-yet-unknowing novice. And of course, in a certain perspective education is, inevitably and always, all of these things. However, the critics of didactic pedagogy seize on its peculiar emphases that position students as passive recipients of knowledge and compliant objects of authority.

The distinctive mode of didactic pedagogy lies deep in the traditions of the societies of writing. St Benedict set the discursive rules of the relation of the teacher to the taught in these terms: that it 'belongeth to the master to speak and to teach; it becometh the disciple to be silent and to listen' (St Benedict c.530 (1949)). This later becomes the genre of the lecture in didactic pedagogy, a one-to-many relation of knowledge authority to knowledge recipient. In didactic pedagogy, the silence of the student may be broken by the teacher via the traditional classroom discourse structure of Initiation—Response—Evaluation (Cazden 2001: 28–30). Initiation: teacher asks a question which anticipates an answer. Response—students put up their hands and the teacher selects one to respond, as a presumed proxy for all in the class. Evaluation: 'That's right', or 'That's wrong, can someone else answer?'

Modern education also introduces the written textbook as a source of authority. If the symbolic founder of oral classroom discourse was St Benedict, the founder of the modern textbook was Petrus Ramus, a professor in the University of Paris in the mid-sixteenth century. Ramus took the texts of classical knowledge—Euclid's geometry, Aristotle's rhetoric, for instance—and rebuilt these as textbooks. The differences between textbooks and source knowledge are revealing. The textbook is a digestible synopsis, divided to manageable chunks, and with ideas ordered from those that are more elementary to more complex, composite ideas (Ong 1958). Knowledge so acquired can subsequently be tested in examinations. The rewards of school success were then in the scores and the rankings achieved, extrinsic rewards less than intrinsic pleasures of coming-to-know. Other written traditions make parallel pedagogical innovations, such as the system of scholarship that went into the making of the mandarin class in imperial China.

The tradition of didactic pedagogy remains alive and well in the 21st century. Two symptomatic examples will suffice. One is Direct Instruction, which has since the 1970s offered curriculum that not only scripts the teacher-initiating dialogue, but correct evaluative answers. Teacher initiation: 'Say the next group of words that are a sentence'. Anticipated

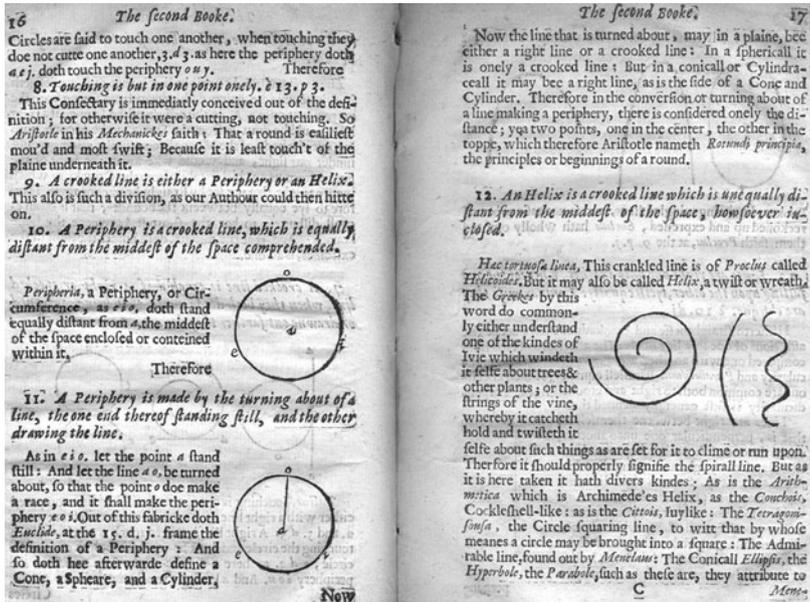


Figure 1.3 Ramus's geometry: the invention of the modern textbook

student response: 'She started to go home'. Teacher initiation: 'What's the last word in the sentence?' Anticipated student response: 'Home'. Teacher initiation: 'So, what do you write after the word home?' Anticipated student response: 'A period'. (Engelmann 2014: 9). Direct Instruction also comes with textbooks that outline the conceptual content of literacy and mathematics in the mode of analytical exposition developed by Ramus centuries before. These remain a staple for poorly-resourced schools in disadvantaged neighborhoods, along with related programs of 'explicit instruction' (Goeke 2009) and 'response to intervention' (Buffum et al. 2009).

For another contemporary example we can explore certain kinds of technology-mediated learning. In the 'flipped classroom' (Bishop and Verleger 2013), the teacher records a video of their lecture and distributes it online. However, the student remains in the same discursive relation to the teacher and knowledge as originally prescribed by St Benedict. Electronic tutors put the machine in the position of teacher in the traditional initiate-respond-evaluate pattern of didactic classroom discourse. With the electronic whiteboard, all students' eyes still need to be directed to the board, a prop for the directive teacher that is not fundamentally different from the chalkboard. And e-textbooks reproduce the textbook form, summarizing, chunking, and sequencing the world in which the students are still positioned as knowledge consumers—absorbers of information to

be remembered, routines to be replicated, or definitions to be applied (Cope and Kalantzis 2015).

Be its mode of delivery old or seemingly new, didactic pedagogy has several distinctive epistemological features. Its core constructs are facts that can be remembered and concepts that can be applied as analytical constructs, rendering correct answers in specific instances. Its principal epistemological precepts are cognitive—memory and logical reasoning. And its theory of the ontogenesis of knowledge is mimetic—knowledge authorities (teachers, textbooks) transmit knowledge which is acquired by learners.

And for as long as didactic pedagogy has been around, whatever its practical utility, it has also been hated and parodied. Charles Dickens makes Mr. Gradgrind the representative teacher:

Thomas Gradgrind, sir. A man of realities. A man of facts and calculations. A man who proceeds upon the principle that two and two are four, and nothing over, and who is not to be talked into allowing for anything over ... [He] ... swept [his] eyes over the inclined plane of little vessels then and there arranged in order, ready to have imperial gallons of facts poured into them until they were full to the brim ... [H]e seemed a kind of cannon loaded to the muzzle with facts, and prepared to blow them right out of the regions of childhood at one discharge. He seemed a galvanizing apparatus, too, charged with a grim, mechanical substitute for the tender young imaginations that were to be stormed away. (Dickens 1854 (1945): 15–18)

Authentic pedagogy

For centuries, the critics of didactic pedagogy have proposed alternatives, beginning with Jean-Jacques Rousseau:

Teach your scholar to observe the phenomena of nature; you will soon rouse his curiosity Put the problems before him and let him solve them himself. Let him know nothing because you have told him, but because he has learnt it for himself. If ever you substitute authority for reason he will cease to reason, he will be a mere plaything of other people's thoughts. (Rousseau 1762 (1914): 126)

The case of these critics has been moral, political, and at times utopian, anticipating that a new and better world can be forged through educational reform. Their case has also been practical, experimenting with new arrangements in laboratory schools and advocating a progressive curriculum, with the aim of demonstrating that their progressive pedagogy achieves the ends of education more effectively than traditional, didactic pedagogy.

The word we will use to name this alternative pedagogy is 'authentic', representing a certain kind of relevance and trueness-to-life. Authentic

pedagogy is true to what-practically-needs-to-be-known in the world, rather than the abstract facts and theories of didactic pedagogy, its academic discipline for discipline's sake. It is also true to student interest and motivation, rather than knowledge that is imposed, or students being cajoled by external motivations such as test scores and beating one's peers.

John Dewey, expressed the spirit of his philosophy of pragmatism in the idea that education should be grounded in experience, not abstract disciplinary schemes, imposed by teachers upon students:

To imposition from above is opposed expression and cultivation of individuality; to external discipline is opposed free activity; to learning from texts and teachers, learning from experience; to acquisition of isolated skills and techniques by drill, is opposed acquisition of them as a means of attaining ends which make direct vital appeal; to preparation for a more or less remote future is opposed making the most of the opportunities of present life; to static aims and materials is opposed acquaintance with a changing world. (Dewey 1938 (1963): 19)

For Dewey, the objectives of progressive education were also political—in the true spirit of democracy to develop practices of active social participation on the part of learners, rather than passive acquiescence to the commands of authority figures (Dewey 1928 (2008)).

Maria Montessori also framed her variant of progressive education politically, in terms of the idea of a learning environment that afforded students greater freedom:

The school must permit the free, natural manifestations of the child ... [T]he true concept of liberty is practically unknown to educators ... The principle of slavery still pervades pedagogy, and therefore, the same principle pervades the school. I need only give one proof—the stationary desks and chairs ... We know only too well the sorry spectacle of the teacher who, in the ordinary schoolroom, must pour certain cut and dried facts into the heads of scholars. In order to succeed in this barren task, she finds it necessary to discipline her pupils into immobility and to force their attention. Prizes and punishments are ever-ready and efficient aids to the master who must force into a given attitude of mind and body those who are condemned to be his listeners ... Such prizes and punishments are ... the bench of the soul, the instrument of slavery for the spirit. (Montessori 1912 (1964): 15–16, 21)

The 20th century is full of attempts to realize the objectives of authentic pedagogy. Rugg and Shumaker proposed the 'child-centred school', whose articles of faith were freedom rather than control, child versus teacher initiative, child interest instead of imposed curriculum, creative experience rather

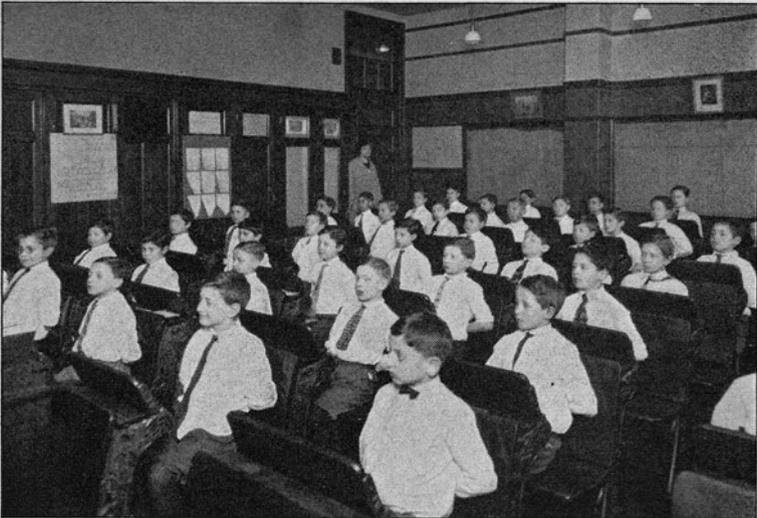
than formal academic discipline (Rugg and Shumaker 1928: 54–64). William Heard Kilpatrick developed the project method, now known as project-based learning, where in the spirit of democratic society, instead of ‘servile acceptance of others’ purposes’ students engage in ‘wholehearted vigorous activity’ in projects where the learner was in control—creating a school newspaper, or a girl making a dress (Kilpatrick 1918; Waks 1997).

As the 20th century moved on, progressivism developed a new strand, under the banner ‘critical pedagogy’. Among its leading lights was Brazilian educator, Paulo Freire. He used the metaphor of ‘banking education’ to characterize didactic pedagogy, ‘in which the scope of action allowed to the students only as far as receiving, filing, and storing the deposits’. In contrast, Freire proposed a pedagogy of liberation focused on problems of justice in the world. ‘Problem-posing education bases itself on creativity and stimulates true reflection and action upon reality, thereby responding to the vocation of [people] as beings who are authentic only when engaged in inquiry and creative transformation’ (Freire 1972: 56).

With the turn to identity politics in the last quarter of the 20th century, critical pedagogy came to be overlaid with the claims for the recognition in curriculum of differences in ethnicity, race, gender, and sexuality (Aronowitz and Giroux 1991; McLaren 2007). Whereas didactic pedagogy ignored or over-wrote diverse identities, assimilating (or failing) others on the measure of mass society and the homogenizing forces of modernity, critical pedagogy gave authentic voice to different identities in the classroom and curriculum.

Another strand in 20th century authentic pedagogy is ‘constructivism’. Tracing the microdynamics of children’s learning, Jean Piaget argued that learners incorporate new experiences through processes of assimilation, and accommodate these experiences by framing them into mental representations (Piaget 1923 (2002)). Learning, in this conception, is a process of active meaning-making. Translated into a pedagogical framework, constructivism is a process whereby teachers immerse learners in experiences and help them to build mental models that make coherent sense of these experiences (Windschitl 2002). The learner is a cognitive agent, building mental models of the world for themselves.

What has been the consequence of this long history of advocacy for authentic pedagogy? Historian Larry Cuban concludes that over the course of the 20th century, in American education, notwithstanding the vociferous calls for reform, didactic pedagogy has remained the norm (Cuban 1993). More recently, it has been argued that computer-mediated learning environments herald the long-awaited widespread realization of constructivist or authentic pedagogy. Cuban’s analysis is again skeptical that anything much changes when computers are brought into the classroom (Cuban 2001). Our own analysis shows that technology-mediated learning can be as didactic as ever, indeed, even more didactic when the machine becomes proxy for the teacher (Cope and Kalantzis 2015).



Courtesy of Miss Elizabeth Irwin, Public School 61, New York

THE NEW AND THE OLD IN EDUCATION

Above: Freedom! Pupil initiative! Activity! A life of happy intimacy — this is the drawing-out environment of the new school. *Below:* Eyes front! Arms folded! Sit still! Pay attention! Question-and-answer situations — this was the listening régime.

Figure 1.4 Rugg and Shumaker's child-centred school, 1928

It must remain an open question whether authentic pedagogy failed to gain ground as a consequence of its own failings, or as a result of the conservative institutional and social inertia, or the effectiveness of its critics. For its critics were certainly vociferous from the start. Boyd Bode and William Chandler Bagley were two contemporary critics of Dewey's progressive education, Kilpatrick's project method and Rugg's child-centred school. Bode argued that learning incidental to projects was:

... too discontinuous, too random, too haphazard, too immediate in its function, unless we supplement it with something else. Perhaps children may learn a great deal about numbers from running a play store or a bank, but this alone does not give them insight into the mathematics that they need to have ... [A]ll this emphasis on 'pupil activity,' on the one hand, and hazy 'practicality' on the other, has operated to make present-day education an intolerably superficial kind of thing. To advocate curriculum construction on the basis, not of subjects, but of pupil activity, easily results in neglect of logical organization. (Bode 1927: 150, 38)

William Chandler Bagley, a contemporary of Dewey at Teachers College, Columbia University, criticized what he called 'the doctrine of interest' underpinning progressive education. He said, it 'lends a specious sanction to neglecting tasks that lack an intrinsic appeal'. He contrasted this with the hard work of learning, including 'warming up to work' even when you don't feel like it, 'practice', repetition, overcoming obstacles, and the travails of mental discipline. Moreover, 'the present tendency in education is toward earlier and earlier differentiation of curriculums ... the basis upon which is the doctrine of interest. ... [However] the function of public education ... [is to lay a] *common* basis among *all* the future citizens of the land'. (Bagley 1915: 239–52)

Later critiques of authentic pedagogy reflect and refract these themes. Leading light of the 'back to basics movement' in the 1980s, E.D. Hirsch, started his comprehensive and best-selling attack with an assault on Rousseau and Dewey. He went on to advocate a return to didactic pedagogy which taught facts, built coherent disciplinary knowledge, and as an antidote to diversity, provided all students with basic knowledge of the traditional canon of a common culture. His concern, he claimed, was as much for disadvantaged students as any:

To withhold traditional culture from the school curriculum, and therefore from students, in the name of progressive ideas is in fact an unprogressive action that helps preserve the political and economic status quo. Middle-class children acquire mainstream literate culture by daily encounters with other literate persons. But less privileged children are denied consistent interchanges with literate persons and fail to receive

this information in school. The most straightforward antidote to their deprivation is to make the essential information more readily available inside the schools. (Hirsch 1988: 23–4)

Critical pedagogy also came under attack as soon as it was articulated, in the form of a vigorous debate about ‘political correctness’ and the sanctity of the western canon, seemingly now threatened by the forces of multiculturalism, feminism, and post-modernist or post-structuralist advocates of difference (Cope and Kalantzis 1997). Meanwhile, African-American educator Lisa Delpit, questioned the underlying cultural assumptions and differential effects of progressivism. Whereas immersive and experiential approaches to learning may work for affluent white students for whom the discourses of power make intuitive sense, explicit teaching is needed for students whose community lives are distant from the cultures of power and the discourses of academic literacies (Delpit 1988).

Finally, the constructivist strand of authentic pedagogy also comes under attack. Kirschner et al. are representative. The failure of ‘constructivist, discovery, problem-based, experiential, and inquiry-based teaching’, they argue, can be traced back to the ‘minimal guidance’ offered by these pedagogies. These, they argue are more effective and efficient because of the inordinate burden experiential learning puts on working memory when dealing with new information. Instead, they advocate ‘instructional approaches that place a strong emphasis on guidance of the student learning process ... providing information that fully explains the concepts and procedures that students are required to learn’ (Kirschner et al. 2006).

This very short history of didactic and authentic pedagogy reveals the longevity of these debates. Today, discussions about technology-mediated learning, from its didactic drill routines to the authentic ‘interest doctrine’ of gamification, revive scenes of contestation that have been part of our educational landscape for more than a century, albeit on a new educational canvas.

Reflexive pedagogy

When we come to propose a ‘reflexive pedagogy’, we at once intend to say nothing new but also something quite new. The ‘nothing new’ part is that there are important insights and practices in both didactic and authentic traditions that we want to retain. Pedagogy is a range of different ‘things you do to know’, a repertoire of learning activity types, including activity types that have their genesis variously in didactic and authentic pedagogy. The ‘something new’ part is that, when connected into a more balanced pedagogy, the constituent components are extended and deepened. We also want to move to a place beyond the pedagogy wars, with their often not-so-thinly veiled accusations. Our suggestion to teachers whose practices by and large fall into one tradition or the other, is to extend your repertoire—which many excellent teachers, in any event, instinctively do anyway.

Following is a comparative overview of pedagogical emphases:

<i>Knowledge Processes</i>	<i>... in Didactic Pedagogy</i>	<i>... in Authentic Pedagogy</i>	<i>... in Reflexive Pedagogy</i>
<i>Experiencing</i>			
<i>... the known</i>	Weak emphasis, as all students are doing the same curriculum, given to them	Strong emphasis, highlighting student interest, identity, and personal experience	Regular returns to student lifeworld experiences, knowledge, and prior experience, with metacognitive reflections
<i>... the new</i>	Limited to new information provided by the teacher and textbooks	Immersion in hands-on experiences: experiments, field trips, investigations in projects, and the like	Immersion in the range of information sources such as those now available on the web, as well as hands-on activities and immersive experiences
<i>Conceptualizing</i>			
<i>... by naming</i>	Strong on naming academic concepts	Weak emphasis, hoping that concepts will develop through exposure	Categorization and classification, definition of concepts
<i>... with theory</i>	Strong on laying out theories, learning rules, deductive reasoning	Weak emphasis—to the extent that generalizations emerge, these come naturally, via inductive reasoning	Developing disciplinary schemas and mental models
<i>Analyzing</i>			
<i>... functionally</i>	Strong on presenting functional explanations	Weak emphasis, on the assumption that this will develop incidental to experience	Argument and explanation, including text, diagram, data visualization
<i>... critically</i>	No or minimal emphasis on critical thinking	Strong emphasis, on the assumption that critical analysis of purposes, interests, and agendas is a key to understanding	Analysis of the interests of people and the purposes of knowledge

(continued)

<i>Knowledge Processes</i>	<i>... in Didactic Pedagogy</i>	<i>... in Authentic Pedagogy</i>	<i>... in Reflexive Pedagogy</i>
<i>Applying</i>			
<i>... appropriately</i>	Strong emphasis, but only to the extent of demonstrating with the right answers, applications of theorems and procedures	Weak emphasis, on the assumption that there is no necessarily 'right' way to do things	Putting meanings and knowledge to work effectively in proximate contexts
<i>... creatively</i>	Weak to no emphasis	Strong emphasis, as student work and projects express individual and cultural perspectives	Transfer of knowledge to different contexts, hybrid knowledge and cultural creations expressing student voice and perspective

By 'reflexive', we mean several things. One aspect of reflexivity is to move between these different Knowledge Processes, where the strength of the learning is the overlay modes of knowing, the productive relation of one Knowledge Process to another—relating the conceptual to the experiential, for instance, or application based on reasoned analysis, or connecting prior experience with new application, and so on. Another meaning of reflexive is the reciprocal connection between the characteristic modes of school or academic learning (conceptual schemes, critical analysis, etc.) and grounded, real-world practical experiences and applications, or simulations of these. Still another meaning is the reflection on alternative modes of professional practice that the Knowledge Processes suggest to teachers. And finally, 'reflexive' refers to the constant vigilance teachers must have, in order to gauge which pedagogical move is appropriate at different moments of the learning process, for different students, and for different subject matters. The mix and the sequence can always vary, and teachers need to be constantly reading student reactions to each move in order to determine the next best move.

By this point, what started as a pedagogy of Multiliteracies—extending or supplementing literacy teaching and learning—has become a larger pedagogical agenda. It has become a pedagogy of communication and knowledge representation for all subject areas.

Knowledge processes: the pedagogical moves of *Learning by Design*

Pedagogy is the design of learning activity sequences. Two key questions arise in the process of pedagogical design: which activities to use and in what order? *Learning by Design* is a classification of activity types, the different kinds of things that learners can do to know. It does not prescribe the order of activities, nor which activity types to use. These will vary depending on the subject domain and the orientation of learners. *Learning by Design* makes several gentle suggestions to teachers: to reflect up the range of activity types during the design process, to supplement existing practice by broadening the range of activity types, and to plan the sequence carefully.

Experiencing is a Knowledge Process involving learning through immersion in the real, everyday stuff of the world: personal experience, concrete

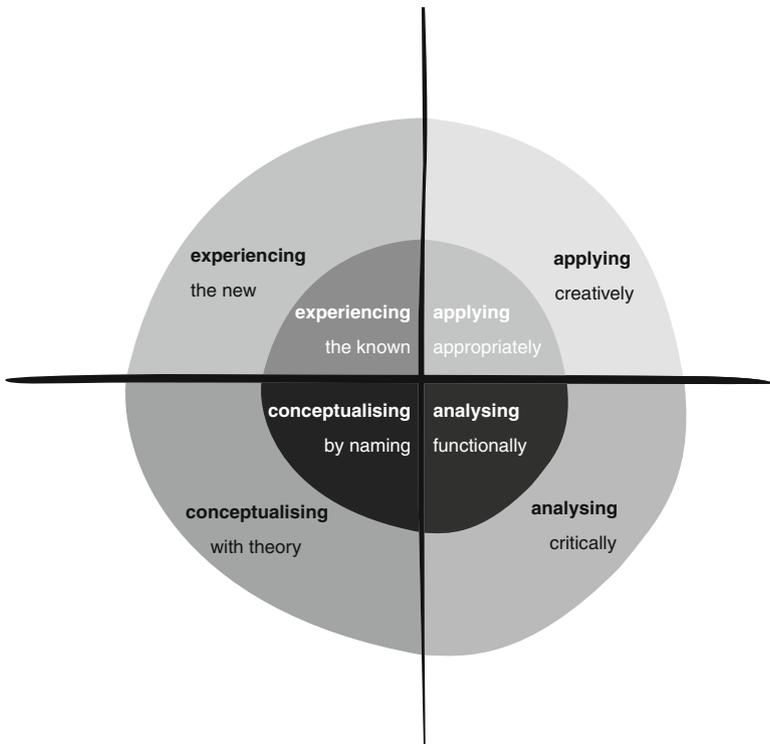


Figure 1.5 The Knowledge Processes

KNOWLEDGE PROCESSES



Figure 1.6 Some examples of the Knowledge Processes

engagement, and exposure to evidence, facts and data. Experiencing occurs as an unexceptional matter of course in the lifeworld—and the learning that is its consequence tends to be unconscious, haphazard, tacit, incidental, and deeply endogenous to the lifeworld. By comparison, the experiencing that occurs in pedagogy in its nature tends to be far more conscious, systematic, explicit, and structured. It assumes a stance in which the experiencing refers to a place outside of the educational setting—by means of textual, visual or audio representation, by simulation or by excursion, for instance. There are two, quite distinct ways of experiencing:

Experiencing the Known is a Knowledge Process which draws on learner life-world experience: building upon the learning resource of the everyday and the familiar, prior knowledge, community background, personal interests, and perspectives and individual motivation. Human cognition is situated. It is contextual. Meanings are grounded in the real-world of patterns of experience, action, and subjective interest. Learners bring their own, invariably diverse knowledge, experiences, and interests into the learning context. These are the subjective and deeply felt truths of lived and voiced experience. Cazden and Luke call these pedagogical 'weavings', such as between school learning and the practical out-of-school experiences of learners (Cazden 2006).

Experiencing the New is a Knowledge Process in which the learner is immersed in an unfamiliar domain of experience, either real (places, communities, situations) or virtual (presented texts, images, data, facts or other represented meanings). The 'new' is defined from the learner's perspective: what is unfamiliar to them, given their lifeworld origins. To make sense of the new in a way which is adequate to productive learning, however, the new at least has to have some elements of familiarity; it has to make at least half sense; it must make intuitive overall sense. For learning to occur, it also needs to be scaffolded; there must be means for the parts that are unfamiliar to be made intelligible—with the assistance of peers, teachers, textual cross-references or help menus, for instance. The result is a journey away from the lifeworld along a horizontal axis of expanding knowledge, taking a cross-cultural journey of one sort or another. Experiencing the New entails immersion in new information or situations, careful observation, and reading and recording of new facts and data. Learners encounter new information or experiences, but only within a zone of intelligibility and safety, of what Vygotsky calls a 'zone of proximal development', sufficiently close to the learners' own lifeworlds to be half familiar, but sufficiently new to require new learning (Vygotsky 1962 (1978): 86).

Conceptualizing involves the development of abstract, generalizing concepts, and theoretical synthesis of these concepts. By means of these Knowledge Processes, learners come to use categorizing terms that reduce the ambiguities of natural language, assembling these into the mental models that typify academic disciplines. In this process, the world comes to have deeper meanings which are not immediately obvious, some of which may even be counter-intuitive and challenge commonsense assumptions. Conceptualizing occurs in two ways:

Conceptualizing by Naming is a Knowledge Process by means of which the learner learns to use abstract, generalizing terms. A concept not only names the particular; it also abstracts something general from that particular so that other particulars can be given the same concept label despite immediately visible and situational dissimilarities. In child development, Vygotsky describes the development of concepts in psycholinguistic terms (Vygotsky 1934 (1986)). Sophisticated adult thinking equally involves naming concepts (Luria 1976). Conceptualizing by Naming entails drawing distinctions, identifying similarities and differences, and categorizing with labels. By these means, learners give abstract names to things and develop concepts. Expert communities of practice typically develop these kinds of vocabularies to describe and explain deep, specialized, disciplinary knowledges based on the finely tuned conceptual distinctions. Conceptualizing by Naming is not merely a matter of teacherly or textbook telling based on legacy academic disciplines, but

a Knowledge Process in which learners become active concept-creators, making the tacit explicit and generalizing from the particular.

Conceptualizing with Theory is a Knowledge Process by means of which concept names are linked into a language of generalization. Or, moving beyond language, the semantic relations of concepts may be represented in visual-iconic, diagrammatic form. In both cases, knowledge is represented in conceptual models or schemas. Such theorizing involves explicit, overt, systematic, analytic, and conscious understanding, and uncovers implicit or underlying realities which may not be immediately obvious from the perspective of lifeworld experience. Theorizing is typically the basis of paradigms or schemas which form the underlying, synthesizing discourse of academic discipline areas. In this pedagogical territory, didactic pedagogy would lay out disciplinary schemas for the learners to acquire (the rules of literacy, the laws of physics, and the like). In contrast, active *Conceptualizing with Theory* requires that learners be concept and theory-makers. It also suggests weaving between the experiential and the conceptual. This kind of weaving might be characterized as a movement backwards and forwards between Vygotsky's world of everyday or spontaneous knowledge and the world of science or systematic concepts, or between Piaget's concrete and abstract thinking.

Analyzing is a Knowledge Process involving the examination of cause and effect, structure and function, elements and their relationships. It requires reasoning in the form of explanation and argumentation. By means of analysis, learners examine the inter-relation of the constituent elements of something, its functioning, and the underlying rationale for a particular piece of knowledge, action, object or represented meaning. This may include identifying its purposes, interpreting the perspectives and intentions of those whose interests it serves, and situating these in context. *Analyzing* takes two forms:

Analyzing Functionally is a Knowledge Process examining the function of a piece of knowledge, action, object or represented meaning. What does it do? How does it do it? What are its structure, function, relations, and context? What are its causes and what are its effects? *Analyzing Functionally* includes processes of reasoning, drawing inferential and deductive conclusions, establishing functional relations such as between cause and effect, and analyzing logical connections. For instance, analyzing a multimodal knowledge representation may involve examining the choices made by creators in the design of their texts, and the effects of these choices in the representation of meanings. By analyzing functionally, learners develop chains of reasoning and explain patterns. The informational and explanatory orientation of *Analyzing Functionally* is typically objective. Weaving towards experiential knowledge processes, the grounding of functional analysis is often experiential, either directly

in the form of personal experience or indirectly in the form of virtual experience such as facts, images, and texts that represent experience.

Analyzing Critically is a Knowledge Process that interrogates human intentions and interests. For any piece of knowledge, action, object or represented meaning, we can ask the questions: Whose point of view or perspective does it represent? Who does it affect? Whose interests does it serve? What are its social and environmental consequences? Analyzing Critically involves critical evaluation of one's own and other people's formative experiences, perspectives, and motives. If the orientation of Analyzing Functionally is to examine the objective world, the orientation of Analyzing Critically is to interrogate the world of subjectivity—human agency, interest, and intent. And if the reasoning processes of Analyzing Functionally are primarily informational, the reasoning processes of Analyzing Critically are mainly argumentative. Weaving towards the experiential, a learner may ask, how do the claims made in an argument align with the evidence supplied? What possible counter-claims might be made (Cope et al. 2013)? What kinds of rebuttals are appropriate? These are the characteristic epistemic moves made by critical pedagogy.

Applying is a Knowledge Process in which learners actively intervene in the human and natural world, learning by applying experiential, conceptual or critical knowledge—acting in the world on the basis of knowing something of the world, and learning something new from the experience of acting. This is the typical emphasis of the tradition of applied or competency-based learning. Applying occurs in unexceptional ways in the everyday realm of the lifeworld. We are always doing things and learning by doing them. We learn by application in the lifeworld in ways which are more or less unconscious or incidental to the process of application, in ways which, in other words, are endogenous to that lifeworld. Application in pedagogy is a process in which knowledge is taken out of its immediate educational setting and made to work beyond that setting. It translates exophoric reference into actual or simulated practice. Applying is about as real as education gets, albeit not as endemically real as the unconscious applications that are of the lifeworld itself. Applying can occur in two ways:

Applying Appropriately is a Knowledge Process by means of which knowledge is acted upon or realized in a predictable or typical way in a specific context. Such action could be taken to meet normal expectations in a particular situation. For instance, objects are used in the way they are supposed to be, or meanings are represented in a way which conforms to the generic conventions of a semiotic or meaning-making setting. Never does Applying Appropriately involve exact replication or precise reproduction. It always involves some measure of transformation, reinventing, or revoicing the world in a way which, ever-so-subtly perhaps, has never occurred before. Applying Appropriately entails the application of

knowledge and understandings to the complex diversity of real-world situations and testing their validity. By these means, learners do something in a predictable and expected way in a 'real-world' situation or a situation that simulates the 'real-world'. This pedagogical weaving brings learners back to the world of experience, but a world into which they have transferred understandings developed in other Knowledge Processes.

Applying Creatively is a Knowledge Process which takes knowledge and capabilities from one setting and adapts them to quite a different setting—a place far from the one from which that knowledge or capabilities originated, or perhaps a setting unfamiliar to the learner. In this Knowledge Process, learners take an aspect of knowledge or meaning out of its familiar context and make it work—differently perhaps—somewhere else. This kind of transformation may result in imaginative originality, creative divergence or hybrid recombinations and juxtapositions which generate novel meanings and situations. Applying Creatively involves making an intervention in the world which is truly innovative and creative. It may also bring to bear the learner's interests, experiences, and aspirations. It is a process of making the world anew with fresh and creative forms of action and perception. Now learners do something that expresses or affects the world in new way, or transfers their newly acquired knowledge into a new setting.



Figure 1.7 Beginning a Learning by Design plan

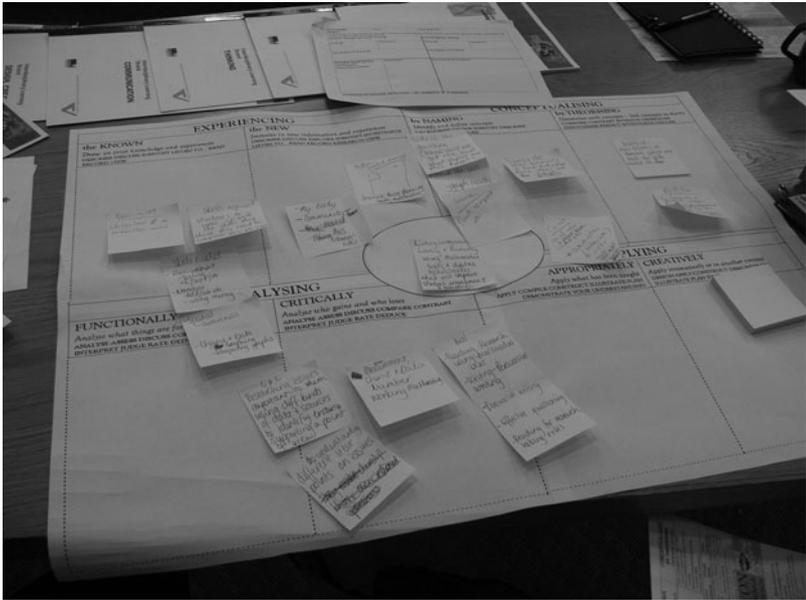


Figure 1.8 The plan begins to take shape

Epistemology and pedagogy

Learning is the process of coming-to-know. Learning is pervasive in the everyday lifeworld. Mostly, it happens without having to think much about it. Such learning is endogenous to the lifeworld, incidental, casual, informal. Pedagogy, by comparison, is formalized learning. It is conscious, premeditated, and structured. Pedagogy is learning by design (Kalantzis and Cope 2014).

In developing the *Learning by Design* framework, we decided to explore the range of epistemological moves that underpin pedagogy by creating a typology of ‘things you do to know’. Our focus here is not on cognition or thinking, but knowledge actions—the Knowledge Processes. These actions are not purely matters of thought. Rather, they are the epistemic actions. They are externalizations of thought in action. They shape thought through action. They require an intensity of focus and self-consciousness in taking the action.

Epistemology is the philosophy of knowing, bringing to conscious reflection the conditions of knowing. In this sense, the Knowledge Processes are epistemological orientations. Following are the underlying epistemological orientations of each of the Knowledge Processes:

<i>Knowledge Processes</i>		<i>Epistemology</i>
Experiencing	... the known	Identification
	... the new	Empiricism
Conceptualizing	... by naming	Categorization
	... with theory	Schematization
Analyzing	... functionally	Functionalism
	... critically	Interpretation
Applying	... appropriately	Pragmatism
	... creatively	Innovation

To know by experiencing

Experiencing the known—identification

Everyday acts of knowing, and the learning that develops as a consequence, are ubiquitous and incidental aspects of lifeworld experience. This is the ground of personal intuition, the unstated obviousness of the already-known, the richness of life fully lived. As a conscious Knowledge Process, Experiencing the Known is this, and more. The ‘more’ entails *identification*, or a conscious, introspective focus on social and environmental conditions of experience. Experiencing the Known has its characteristic methods for reading deeply into experience. These might involve tracing the roots of subjectivity, accounting for the sources of beliefs, articulating the reasons for perspective, explaining stance, narrating sequences of experience, contextualizing position and context, describing identity, reflecting on motivations, justifying convictions, recognizing the embodied, framing the performative, feeling the sensual, or articulating the intuitive.

What makes Experiencing the Known different from casual experience is its degree of conscious self-reflection, metacognitive awareness, and explicit identification. Nor does this Knowledge Process necessarily leave the known world unaltered. Experiencing the Known is not only to observe or read the world. It can also through its intensive and focused processes of observing and reading, transform the world. The act of articulation can make it more stable. One’s commitments may become stronger as they become clearer. On the other hand, Experiencing the Known may destabilize one’s world by uncovering its limitations or contradictions. Damasio describes this kind of learning as a transition from the proto-self with primordial feelings, to the self-creating autobiographical self, capable of interpreting present actions in terms of lessons drawn from the experiences of the past, and, on this basis, anticipating future actions (Damasio 2010).

Late 20th century epistemologies of post-structuralism (Derrida 1978; Spivak 1987) and post-modernism (Jameson 1991; Lyotard 1979) focus

on the ways in which knowledge is framed relative to historical, social or cultural context. Knowledge is to a significant degree a product of the identity position of the person who is articulating that knowledge. Truths do not exist in themselves, but are framed by the social meanings ascribed by language (Rorty 1989; Wittgenstein 1958). These epistemologies stand in opposition to empiricism (facts speak for themselves) and rationalist idealism (universal reason makes sense of the world). The occupational hazard of such epistemologies of identification, however, is excessive subjectivism (the world cannot be much more than my subjective experience of it), and agnostic relativism (there can be no truth because every perspective is valid) (Damasio 2010: 10, 23).

Experiencing the new—empiricism

In the 17th century, John Locke presented an *empirical* view of the sources of knowledge in these terms: ‘Our observation employed either, about external sensible objects, or about the internal operations of our minds perceived and reflected on by ourselves, is that which supplies our understandings with all the materials of thinking (Locke 1690: Book 2, Chapter 1: 2)’. Observation of the world is the raw material for our subsequent thinking about the world. From this, emerges ‘the scientific method’ in which, based on initial or previous observations, we develop an hypothesis—a proposition or question about an object of potential investigation. Then we observe that object carefully, collecting data from extended, intensive or repeated observation. This allows us to isolate facts—things that have been proven or shown to be repeatedly or inarguably true—from mere conjectures or opinions. We draw conclusions from these facts through a process of inductive reasoning, or reasoning derived from observation.

In the Knowledge Process of Experiencing the New, our knowledge actions may include methodical observation, recording, describing, measuring, testing, experimenting, interviewing, or surveying. These are all ways to encounter the empirically unknown in order to establish facts or evidence that replace uncertainty with at least somewhat greater certainty than before. This is also how one moves outside the familiar territories of lived experience, observing things that have not been observed this carefully or in these ways before, or facts that have not been documented before. Habermas calls this orientation to knowledge ‘empirical/analytic’ (Habermas 1978: 302).

It is a distinctive feature of empiricism to speak ‘objectively’, as if the observations have been so careful that the facts must now speak for themselves. This is to take empiricism to one-sided excess. Despite its pretenses to objectivity, it never stands alone without the complement of the other Knowledge Processes. Even Locke would agree to the extent that the mind interprets its observations through reflection.

To know by conceptualizing*Conceptualizing by naming—categorization*

'I think, therefore I am', René Descartes famously said (Descartes 1637 (1985): 20). The world would not exist, in this view, but for our figuring of it in thought. Immanuel Kant argued that, in order to make sense of the world, we need to *categorize* things, and to reason on the basis of these categories (Kant 1781 (1933): 22–7). Habermas describes this as the basis of a 'hypothetico-deductive' tradition in the philosophy of knowledge (Habermas 1978: 308). In the field of education, Vygotsky and Luria have traced the development of abstract concepts in children, tracing a shift in the underlying meanings of words as they become capable of generalizing from instances of the particular. This is the basis for the 'scientific reasoning' that is a characteristic feature of modern schooling (Luria 1981; Vygotsky 1962 (1978)).

Conceptualizing by Naming develops and applies categories that are based on finer semantic distinction, consistency, and agreement than is normally the case in everyday language. Such is the nature of academic, expert, technical, and professional discourses. The methods of Conceptualizing by Naming include grouping a number of specific instances under a concept label on the basis of underlying attributes, classifying, defining, and abstracting criterial features. They may also involve distinguishing things that are unlike. The occupational hazard of such work is to create excessively rigid conceptual schemas that over-simplify the messy complexity of the empirical world (Bowker and Star 2000).

Conceptualizing with theory—schematization

We use our faculties of reason to put concepts together into theories. For instance, we may say that concept A is related to concept B because, different though they are, they are both instances of concept C. Such is the nature of mental models (Johnson-Laird 1983) and conceptual schemes (Blackburn 2005: 201).

The danger of excessive reliance on Conceptualizing with Theory is that we can allow our schemas to get ahead of experience. They may become overly abstract. Students may feel that such theoretical learning is 'too hard' or 'not relevant'. Theories may also be presented to us as if they represent taken-for-granted truths when, in fact, they could be open to legitimate challenge.

To know by analyzing*Analyzing functionally—functionalism*

'If all humans are mortal,' said Aristotle, 'and all Greeks are humans, then all Greeks are mortal' (Aristotle 350 BCE). Kant called these 'analytic propositions' (Kant 1781 (1933)). If the tendency of empirical thinking is to reason

inductively, then the tendency of *functionalist* thinking is to reason deductively. Typical moves in the Knowledge Process of Analyzing Functionally include logical reasoning, tracing cause and effect, inferring, and predicting. Functional reasoning is often externalized in argument (Toulmin 2003), when for instance, the reasons for a claim are supported by evidence, logical connections are made, multiple claims are made to support these, and conclusions are drawn.

Among the occupational hazards of this kind of knowledge work is to develop formal reasoning that is disengaged from human and natural consequences, to create systems of technical control without adequate ethical reflection, to elide means and ends, and to promote a narrow functionalism, instrumentalism or techno-rationalism. Critics accuse analytical-functionalists of logocentrism, or privileging abstract and formal logic over humane sensation, feeling, and emotion. They accuse it of anthropocentrism, or unreflectively putting humans at the center of the universe. They also argue that it does not take sufficient account of human differences. Rationalism seems to imply that if they were to think hard enough and long enough, everyone should come up with the same rational answers. However, humans in different cultural contexts, and who speak different languages, think differently.

Analyzing critically—interpretation

‘The philosophers have only interpreted the world, in various ways; the point is to change it’. This was the challenge laid down by Karl Marx to his fellow philosophers in his 1845 ‘Theses on Feuerbach’. What followed was a major tradition of thinking about the nature of knowledge that Habermas calls historical/hermeneutic/critical (Habermas 1978: 311–14). Empiricists tend to cloud their interest in the language of objectivity, the facts seemingly speaking for themselves, when in reality, the facts have been selected. The schematizers and the functionalists tend to speak as if reason is self-evident, rather than something that is at times opportunistically marshaled in support of particular social and cultural agendas. By contrast, a critical, *interpretative* perspective on knowledge interrogates the interests, motives, and ethical (or unethical) stances that may motivate knowledge claims. It promotes, in other words, an ever-vigilant process of critique. Some interpretative moves of this Knowledge Process include interrogating purposes, agendas and biases underpinning one’s own knowledge work and the knowledge claims of others, situating knowledge in its social and cultural context, demonstrating awareness of competing perspectives, articulating and supporting or rebutting alternative arguments, and developing meta-cognitive awareness of the specific conditions of one’s own thinking.

The dangers of this approach are an agnostic relativism—no knowledge can have any particular virtue, when every act of knowing is a matter of perspective. Such is the tendency of post-modern and post-structuralist

thinking (Rorty 1989) where, following Nietzsche, there are no facts, only interpretations (Nietzsche 1901 (1968): 267). If empiricism is overly objective in its orientation, critical interpretations are at times overly subjective. Also, despite best intentions, critical interpreters can all-too-easily become armchair critics, able to criticize but unwilling or unable to act or create alternatives to the objects of their criticism.

To know by applying

Applying appropriately—pragmatism

In philosophy, the tradition of *pragmatism* considers knowledge to be a process and product of practical activity (Dewey 1929 (1960)). This Knowledge Process may represent a return to the experiential world after empirical observation, schematic clarification, and analytical reasoning. This time the return is in order to do something that practically impacts on the world. However, as a Knowledge Process, it is different from circumstantial, informal knowledge of, and learning in, the world. It involves extra effort: translating well-laid plans into action; observing interim outcomes; and adjusting applications based on these outcomes. Applying Appropriately involves the design and implementation of practical solutions that achieve technical or instrumental outcomes. It may involve the transfer of theoretical knowledge into practice.

The critics of this kind of knowledge making accuse it of a pragmatism which may at times be too narrow. It may reflect an uncritical stance that leaves purposes and outcomes unexamined. It might even border on unreflective opportunism—because an application works, it seems it must be right. It may then be accused of uncritical instrumentalism.

Applying creatively—innovation

Knowledge work is also at times inventive and *innovative*—taking lessons from one location and attempting to apply them in a very different location, taking imaginative leaps (Sartre 1940 (2004)), visioning dramatically different alternatives, working across the boundaries of academic and professional disciplines, challenging paradigmatic assumptions, or intervening to change conditions in the natural or social world. This Knowledge Process may involve risk taking. Its outcomes may be considered evidence of creativity. However, its dangers are voluntaristic overconfidence that leads to a naive misreading of pragmatic circumstances, and failure.

By design

To do something ‘by design’, is to do it with a peculiar intensity of focus. Design is premeditated, a series of explicit stages of action. Each of the Knowledge Processes is a way of seeing and thinking, an orientation to the world, an epistemological take, a sensibility or way of feeling, and for



Figure 1.9 Teachers thinking about learners' thinking



Figure 1.10 After achieving a balanced range of Knowledge Processes, teachers begin to sequence these online

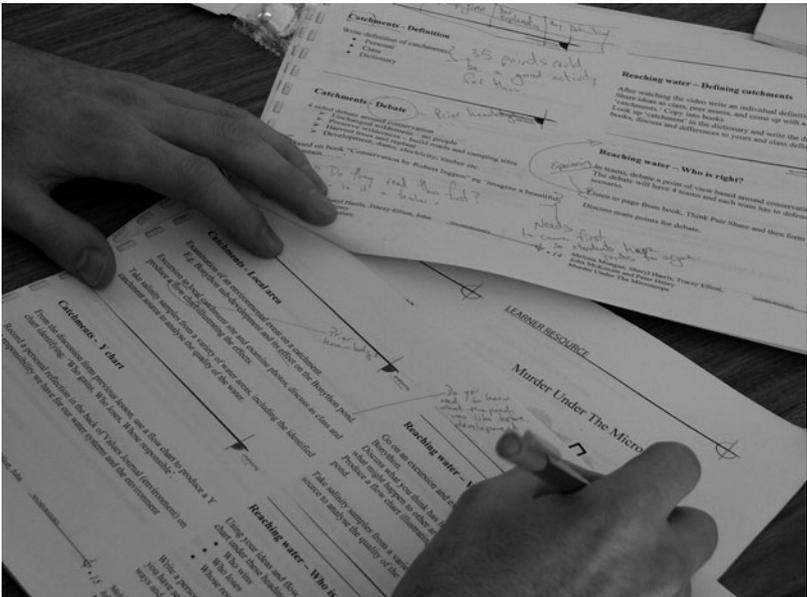


Figure 1.11 Revising the plan, after teaching the Learning Module

shorter or longer moments in time, a way of being in relation to the knowable world.

Our notion of *Learning by Design* applies both to teachers and learners. For teachers, we mean to identify the range and sequence of epistemological moves that underlie their teaching. Teachers become designers as they select the range of activities they will bring to the learning environment, plan their sequence, and reflect on learning outcomes during and after the learning. This design activity is itself a professional learning process. For learners, when the Knowledge Processes are explicitly named, they develop conscious awareness of the different kinds of things they can do to know. Increasingly, they become designers of their own knowledge and take greater control over their learning.

The Knowledge Processes that we and the other authors explore in this book are deeply rooted in traditions of pedagogy and epistemology. Our aim is to map rather than prescribe, to trace long historical genealogies rather than promise something totally new. The mix and sequence chosen by a teacher-designer may vary depending on the subject domain or the orientation of the learner. If we suggest change in practice, it is that teachers might expand their pedagogical repertoire and that learners might engage in a wider range of knowledge actions. The learning becomes more powerful not only as a result of expanding the range of Knowledge Processes, but in the shifts between one way of knowing and others. The move from the processes in the inner circle of the diagram to the outer is relatively straightforward; the shift between quadrants is more challenging. The strength of *Learning by Design* is not what is in each quadrant, but the transitions between quadrants—and this is what didactic and authentic pedagogies have each neglected, in their relative one-sidedness, their habitual staying-within their characteristic pedagogical and epistemological frames of reference. Such transitions might be likened to key shifts in music or mood swings in psychological affect.

In the spirit of *Learning by Design*, the book that follows moves from this highly conceptual and analytical introductory chapter, to the grounded experiences of schools, and teachers' remarkable efforts of application. The narratives of teaching and learning in the chapters that follow are strikingly varied, from country to country, one level of schooling to another, and across a range of subject areas far broader than 'literacy', conventionally understood. And moving even closer to grounded pedagogical practice, hundreds of *Learning by Design* Learning Modules, written by teachers and applying the Knowledge Process pedagogy, can be found in the Bookstore at www.cgscholar.com

As for the pedagogy of Multiliteracies, it does represent one big shift of emphasis. Both didactic and authentic pedagogies focused on such things as memory, understanding, reasoning—in short, meanings internalized in individual minds. Both are cognitively oriented theories of learning. The pedagogy of Multiliteracies, however, as articulated in *Learning by Design*, is



Figure 1.12 Learning by Design classroom

an epistemological theory of learning. Knowledge is not (just) the stuff that ends up in our minds. It is what we do and make. Learning is a consequence of a series of knowledge actions, using multimodal media to externalize our thinking. We rely on the cognitive prostheses of writing, computers, diagrams, image and sound recordings, and the like. Learning consists of ways of acting in and with these media. By these means, our ways of thinking develop. Learning for this reason is also very social, as we rely on the artifacts of collective memory, and work with others in the essentially collaborative task of knowledge making.

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2

Digital Resources, Reflexive Pedagogy, and Empowered Learning

Sandra Schamroth Abrams

This chapter looks closely at an online participatory learning environment that supported and layered experience and ideation, creating opportunities for early-career educators to articulate and contemplate evaluative norms, digital resources, and evolving practices. More specifically, flexible and contextualized approaches to learning deeply rooted in the knowledge processes (Kalantzis & Cope, 2010, 2012) empowered early-career educators to perceive themselves as agents of change, and the data provide insight into reflexive pedagogy that is sensitive to dynamic and shifting technologies, contexts, and cultures.

Overview

“Pedagogy is a knowledge process” (Kalantzis & Cope, 2005, p. 71) because it involves a critical and iterative (re)consideration of students’ knowledge and abilities as a teacher “carefully calibrates the distances between the learner’s known lifeworld and the transformational possibilities of the to-be-known” (Kalantzis & Cope, 2005, p. 71). The scaffolding inherent in such effective pedagogy also accounts for the interplay of the knowledge processes: 1) experiencing the known and unknown, 2) conceptualizing the abstract and theoretical, 3) analyzing functions and perspectives, and 4) applying knowledge appropriately and creatively (Kalantzis & Cope, 2005, 2012; Cope & Kalantzis, 2009). With its origins in the Multiliteracies framework (New London Group, 1996), these four *Learning by Design* “pedagogical orientations” represent the relationship among socio-culturally situated understandings and discoveries and the (re)creation and/or transformation of meaning and artifacts.

These pedagogical orientations help to shed light on the needs of current and future citizens in what Kalantzis and Cope (2005) call a “Knowledge Society.” The demands of contemporary learners include increased reflexivity that attends to contoured experiences and multi-modal meaning-making:

[T]he classroom of the reflexive society must allow alternative starting points for learning (what the learner perceives to be worth learning, what engages the particularities of their identity). It must allow for alternative forms of engagement (the varied experiences that need to be brought to bear on the learning, the different conceptual bents of learners, the different analytical perspectives the learner may have on the nature of cause, effect, and human interest, and the different settings in which they may apply or enact their knowledge). It must allow for different learning styles (preferences, for instance, for particular emphases in knowledge making and patterns of engagement—experiential, conceptual, analytical, or applied). It must allow for different modalities in meaning-making, embracing alternative expressive potentials for different learners. And it must allow for alternative pathways and destination points in learning. (p. 46)

Effective pedagogy, therefore, involves the acknowledgment of and sensitivity to the nuanced and situated characteristics of learning *and* the individual learner. Though these are established concepts, they become complicated by shifts in curricular standards, institutional norms, available resources, and students' needs. How educators anticipate and respond to these shifts provides insight into their pedagogical development in spite of inherent constraints. Exploring how early-career educators perceive education, technology, and their students' needs, this chapter draws upon the knowledge processes (Kalantzis & Cope, 2010, 2012)—experiencing, conceptualizing, analyzing, and applying—as a heuristic for understanding the educators' pedagogical positions.

Teachers as learners; learners as teachers

Often pre-service educators begin their careers soon after graduation, and they face the well-established reality that workplace cultural norms will influence their teaching and, perhaps, their pedagogy. Danin and Bacon (1999) emphasized how educators need to be keenly aware of institutional standards and practices: "Teachers new to a school building must quickly learn the culture and the related nuances that go along with the singular and collective personalities of the staff. A school's culture can have a direct effect on a first-year teacher's experience" (pp. 203–205). At that point, many first-year teachers do not have immediate ties to the university classroom, and they rely on in-house communication and/or mentorship for induction (Ingersoll, 2012). However, there are those who traverse both worlds—educators who teach in the classroom during the day and attend graduate education classes in the evening. These individuals live the double life of teacher-student, already encountering the experiences of an early-career teacher, yet also perceiving education through the lens of a graduate

student. Their developing pedagogy offers another window into contemporary teaching and learning.

In this current discussion, the voices of early-career teachers emerge and suggest that, despite cultural constraints, the educators perceive flexible and contextualized approaches to learning; these practices are deeply rooted in the knowledge processes (Kalantzis & Cope, 2010, 2012) and include technologies to engage and empower their students.

The context: data collection and analysis

This chapter features a case study of a cohort of 23 in-service educators enrolled in their second year of an alternative education program. The cohort attended graduate education classes that focused on participatory practices and technology integration in middle and high school classrooms. These early-career educators were teaching special education students in schools in the New York City metropolitan area; some of these educators taught Special Education Teacher Support Services (SETSS) classes, which had a small teacher-to-student ratio to enhance their ability to meet each student's Individualized Education Program (IEP) objectives. The educators-as-graduate students often focused on finding technologies that would help them to address their students' needs within the parameters defined by their school's norms.

Over the course of a 15-week semester, the early-career educators used the real-time discussion space, *backchannelchat.com*, to post pedagogical concerns, intentions, and insights. These educators-as-graduate students needed a special code to access the backchannel chat dedicated to each class session because it was not available for public consumption; as the professor of the class, I introduced backchannel chat as an optional participation space, and I provided all necessary codes and links to facilitate the cohort's involvement and collaboration. Throughout most of the weekly class sessions, and typically in conjunction with whole-class discussions, the early-career educators voluntarily contributed to backchannel chats, thereby engaging in both spoken and written conversations with their classmates. This combination of face-to-face meetings with synchronous online discussions has been reported to heighten reflection, critical thinking, and pedagogical development (Abrams, 2012). Additionally, online discussion spaces have been known to provide opportunities for uninterrupted turn-taking in which each person can "speak without pause, inspiring declamations as well as dialogues" (Burniske, 2000, p. 60, as cited in Grisham & Wolsey, 2006, pp. 651–652). In this way, students could immediately share their ideas and receive feedback in an informal manner reminiscent of social networking and SMS messaging, in which digital discourse is not subjected to school-based grammatical evaluation (Crystal, 2006; Turner, 2010, 2011; Turner et al., 2014). Further, the space supported agentic learning that accompanies the "added control and interaction provided to learners using

technology tools” (Beldarrain, 2006, p. 143) and the multimodal expressions of meaning that represent both in-school and out-of-school experiences.

Each of the backchannel chats began with a professor-generated prompt that was related to the material the students had read and/or were about to encounter. Prompts included general instructions, such as “Please use this space to keep a running record of ideas as you watch Sir Kenneth Robinson’s TED talk”; others cued students to draw upon specific experiences. For example, one backchannel chat prompt included two questions for the students to critically consider in light of their current pedagogy and practice:

Please base your response on your interpretation of the videos, as well as our classroom discussions:

- 1) What are some techniques or approaches that you would like to try in your classroom? Why?
- 2) What are some of the affordances and constraints of these techniques or approaches?

The prompts were open in nature to allow a range of voice and responses to emerge. Spoken communication complemented the online postings and typically encouraged students to elaborate their points; this would happen not only as a direct suggestion from me, the professor (e.g., “You mentioned ‘x.’ Would you please elaborate.”), but also as a result of diverging and converging student-generated insights uttered aloud. The culture of conversation online and offline soon began to meld. At times, after reading a backchannel chat post, a classmate would turn to the author and provide spoken feedback. At other times, during in-class discussions, students would post a thought or concern on the backchannel chat, and, similar to texting, they would write immediate responses to one another, “like” a post, include text-based emoticons [:)] or abbreviated terms, like “lol.” Though not required, proper spelling, punctuation, and capitalization were honored by some.

Transcripts from the backchannel chats were printed, and, along with researcher field notes, data were pre-coded (Layder, 1998) using the four pedagogical orientations: experiencing, conceptualizing, analyzing, and applying. Though initial coding required the parsing of these four orientations, additional iterations of coding and the theming of data (Saldaña, 2012) revealed the overlapping and inherent interrelationship among the elements of the knowledge processes. This underscored what Cope and Kalantzis have indicated about the nature of the four pedagogical orientations and “the process of moving backwards and forwards across and between these different pedagogical moves as weaving (Luke et al., 2004)” (Cope & Kalantzis, 2009, p. 184). As such, additional categories included overlapping orientations, as well as characteristics of a Reflexive

Knowledge Society (Kalantzis & Cope, 2005)—collaboration, resilience, openness, multimodalities, and agency—which emerged through iterative coding.

Findings

The early-career educators' online discussions revealed a developing reflexivity that honored a culture of collaboration, resilience, openness, multimodalities, and agency. The educators-as-graduate-students shared pedagogical insights, problems, and possibilities, and these discussions included a reticulated pattern of teaching experiences, understandings of education, analyses of practice, and ideas for classroom application. In what follows are excerpts from backchannel chat dialogue that ran parallel to in-class activities and/or discussions.

Perceiving student needs

We do create our lives. And teaching children that they create their lives is essential—Joseph, backchannel chat post

Echoing some of the words from Sir Kenneth Robinson's TED talk, *How to Escape Education's Death Valley*, Joseph (all names are pseudonyms) not only acknowledged his own beliefs in agentive learning, but also perceived the application of Robinson's points to his own practice. In fact, the emphasis on empowering students resurfaced throughout that backchannel chat, as the early-career educators contemplated the needs of their students in relation to curricular and evaluative structures. For example, Joseph exclaimed, "ADHD is NOT an epidemic. Get them doing things that interest them!" Following this position were responses from classmates, including Darla, who agreed with Joseph and confirmed his position by noting her own realizations: "Exactly [Joseph]. I think about this all the time as I write IEP's. When I see my students who are diagnosed with ADHD actually engaged in a lesson, I don't see this type of 'ADHD' behavior." Though these educators were new to the field, their perceptions of over-labeling revealed how they questioned current diagnoses and procedures and considered their responsibilities to engage and motivate learners.

Similar tensions and passions surfaced in conversations about labeling as a deficit model. Sujani noted how "those who are alternatively assessed only get a certificate saying they completed high school, no [R]egents diplomas ... life skill classes need to be offered." The importance of life skills resonated for a number of the early-career educators, as they also analyzed curricular limitations. Darla called upon her own experience and added another dimension to Sujani's point: "I have a student who is alternatively assessed. It breaks my heart that she is in Regents courses. I don't get it. She

needs to LEARN life skills. She loves to cook, and I wish she had this type of exposure.” Building upon this point, Sharon applied Darla’s example to a more general concept by responding: “The unfortunate reality is that many of them will not go to school past high school and they need to be able to know how to go grocery shopping, balance a checkbook, cook (safely), etc.” These educators revealed their resolute beliefs in teaching financial and health literacy to meet students’ basic lifeworld needs, and they noted their disappointment in curricula that ignored such foundational principles. Though Sharon seemed resigned to accepting current curricular structures (“The unfortunate reality”), she nonetheless perceived the incongruity between what skills the students needed in order to be productive citizens and what they currently were encountering in school.

Further, their classmate, Jackie, argued that teaching life skills is necessary for students in all classes and not just those in special education. She explained that she would “like to see ALL students learn daily living skills. How to cook healthy meals, etc.” In addition to emphasizing the importance of life skills and overall health and safety, the educators’ recommendations suggested they had a foundational understanding of Maslow’s hierarchy, which affirms how basic needs must be met first before one can be an active citizen and realize his/her full potential.

As the early-career educators critically reflected upon the needs of their students, they repeatedly noted the importance for “alternative pathways and destination points in learning” (Kalantzis & Cope, 2005, p. 46). Responding to a classmate’s spoken comment, Carolina posted on backchannel chat, “Excellent point [RC] ... Some of our students are highly artistic and/or athletic while they struggle in other areas. By allowing them access to the arts and physical education, this lets them experience success and gain self-confidence.” The educators were keenly aware of the role of multimodal and multi-directional learning, and they articulated the importance of flexible pedagogy that includes agentic, student-driven meaning-making. Ralph explained:

I think most kids will thrive with a greater degree of freedom—teens are always pushing for more freedom—consistently telling them “no” and limiting their freedoms/privileges [sic] is indirectly proportional to what most teens need and want. Yes, some kids are out of control and need strict boundaries, but I think a great deal of the misbehavior comes from the feeling of being constricted, cramped up, and not allowed to make enough decisions regarding educational options both macro and micro.

Ralph reiterated the connection between behavior and engagement, and he underscored how overly-scripted and “constricted” pedagogy and practice can stifle learning.

Perceiving pedagogical change with digital enhancements

Shhhhh....don't tell my principal!—Soledad, backchannel chat post

Throughout the semester, Soledad maintained a resolute intention to use Khan Academy (<http://khanacademy.org>) to “flip” her classroom; she wanted her students to first encounter the material through the online videos so that she could use the classroom time to address individual questions and ideas for application. In the aforementioned post, she took a stand, noting “I am now officially using Khan Academy and ‘flipping’ my classroom,” naming her practice as “official” while simultaneously acknowledging that it was a covert approach that she had selected to meet the needs of her students. Throughout that class session, Soledad continued to post her interest in Khan Academy and subsequently spurred a collaborative discussion about current practices and curiosities, as well as ideas for modification. In what follows is a transcript of the exchange among the early-career educators in which they juxtaposed their own learning experiences with their pedagogical understandings; one student even selected the screen name “khanfan” for this particular conversation. As the students engaged in the online dialogue, they also visited the Khan Academy site, researching its capacities and functions. Because students could post simultaneously, there were times when questions and answers were separated by colleagues’ postings regarding their discoveries.

- Reyna: My co-teacher and I were reflecting yesterday about our schooling growing up. There was so much repetition and practice of the skills. If students don't have that foundation, how can they take it to the next level?
- Anna: It is probably better to use this [Khan Academy] than wait for the “pre” and “post” test results ... get feedback immediately on where they struggle.
- Khanfan: The tracking is immensely helpful—individualized at best.
- Rolland: Does Khan Academy cover all content areas in their student activities?
- Soledad: Rolland what do you mean?
- Ralph: I'm thinking Khan Academy for my SETSS classes. That said, I want to do exit tickets with pen and paper so the kids can relate the concepts from the video to the pen and paper format used in their core classes.
- Mallory: I was thinking the same thing [Ralph].
- Mallory: It definitely is a good idea.
- Sage: I completely agree with [Rolland]—Khan is great in terms of providing students with ownership over their learning.
- Rolland: Soledad, I meant, can they access subjects such as Earth Science, Chemistry, etc.?

- Mallory: There is pretty much every subject in this thing.
 Khanfan: The teacher is the coach; she still directs the play.
 Darla: Very true!
 Rolland: The human element of education is irreplaceable; therefore teachers will never become obsolete.
 Reyna: Yes! We still have to assign and monitor and use it to help us plan our lessons.
 Jackie: I just want to pen a cool sci-fi novel on the possibility.
 Rolland: You should total[ly] go for it, [Jackie]!
 Rolland: Totally....
 Ralph: Ghengis Khan—back with a vengeance.
 Ralph: Medicine doesn't make doctors obsolete. They are a gateway. With all the possibilities.
 Khanfan: Great analogy, [Ralph]!
 Darla: Amazing analogy!
 Ralph: ... all the possibilities of connectivity, as we teachers are becoming gateways/facilitators, as learning from one person is now antiquated.

The early-career educators may have focused on Khan Academy. However, inherent in their discussion was their developing pedagogy that echoed seminal points about contemporary meaning-making, including, but not limited to, individualization, the teacher-as-facilitator, and multi-dimensional, multi-sourced learning. Personal experiences and interests (“schooling when we were growing up” and “I just want to pen a cool sci-fi novel on the possibility”) peppered the discussion, thereby adding another layer of relevance. Not only were the educators rethinking their current practice, but also they saw the connection and extension of their conceptualizations to their own past and future lifeworlds. They were reflexively projecting possibilities while also regurgitating the normative discourses of their workplace; assessment jargon, such as “exit ticket” and “tracking,” existed in the same chat forum as acknowledgments for supporting students’ “ownership over their learning.”

Logistical and technical limitations

Despite the early-career educators’ excitement to discover and integrate technologies to support student learning, they faced very real logistical and technical limitations in their schools. For instance, many of these special education teachers did not have a dedicated space. As Carolina reflected, “I think it gets a little more convoluted at the high school level, particularly for the special education teachers who are going from room to room. The time it would take to retrieve the equipment from the cart and then return

it.” Jackie agreed with this sentiment, calling upon her own experiences and insinuating a level of exhaustion that accompanies such limitations: “Yes, [Carolina]! I’m never in the same room consecutively. 3 different rooms! I wish I had roller skates :).”

The early-career educators also called attention to workplace protocols and time constraints that disrupted and impeded instructional innovation. Jackie explained how her students had to:

sign in and out for each numbered laptop each period so we have accountability ... it takes a lot of time to set up technology and disassemble [sic] at the beginning and end of each period in higher grades since everyone is in flux (definitely another plus for the elementary teachers in one room).

Carolina noted her taxed personal-professional bandwidth (Olmanson & Abrams, 2013) that left her little time to adopt and adapt new approaches and technologies: “The biggest challenge is finding the time to implement new things.” Similarly, Mallory, who perceived the “need to figure out how to integrate some of this technology into my class,” found that “with my courses, it is hard to find the time to do the fun things.”

Selecting appropriate technologies was also a consideration. When discussing a variety of computer-based programs for independent work, Jackie quickly acknowledged the institutional demand for documentation and her frustration with programs that did not provide an accountability trail or a model for students to consult. She explained, “I find sometimes with technology there isn’t a ‘tangible record.’ If the students are just answering questions on a computer game, do they have anything they can refer back to (i.e.: notes, modeled problems)?” Rolland took this one step further and considered the benefits to using offline components: “It is so necessary to integrate both online and offline learning. Giving students a higher level of independence in their learning experience is, in my opinion, an effective way of getting them college & career ready.” In other words, by reflexively analyzing the use of digital and non-digital tools, some of the early-career educators saw this combination supporting efforts related to pedagogical accountability, efficiency, relevance, and effectiveness.

However, the backchannel chat dialogue also addressed the reality of technical limitations. Jackie posted a shared insight discovered during in-class conversation; she noted that Sharon and she “discussed when we finally come up with a lesson where we want to use technology, allocate it into the unit, and plan to use it, we can’t reserve the cart, [or] all of the computers aren’t plugged in/charged.” Mallory also explained how such technical difficulties could stymie a lesson: “the students were unable to get on a lot of the time, it [the computer] would shut down on them often.” Such

issues related to usage and storage might be rectifiable, but they also require time and care, both which might be sacrificed for increased (or maintained) instructional time.

As much as the early-career educators bemoaned these constraints, they also revealed a level of resourcefulness rooted in collaboration. On the backchannel chat, Soledad reported an approach Veronica and she had discussed in a face-to-face conversation that offered a problem-based solution, which included digital tools and non-digital collaboration:

[Veronica] and I have issues in getting computers/laptops accessible for all students in the room. We did however talk about the fact that we share some of the same students and we are having behavioral issues with them. [W]e talked about joining forces and using class dojo [sic] for the same group of kids to track their behavior in real time and displaying [the program] on the whiteboard.

Inspired by this post, Sage indicated a similar interest on backchannel chat: “[Soledad] & [Veronica]—I started setting up the 7th graders on Class Dojo. I think we should all do it together!” In this exchange, there was confidence in collaboration and agency. With traces of idyllic resoluteness (“joining forces”), these educators asserted how they would work together to use technology in a way that promised to enhance student performance.

Discussion and conclusion

The backchannel chat dialogue provided insight into the early-career educators’ understandings of flexible teaching and contextualized learning. Their emerging reflexivity stemmed from their developing pedagogical orientations. For instance, drawing upon their experiences as both graduate students and middle or high school teachers, the early-career educators contemplated practice in light of established educational theories and institutional norms. As such, they conceptualized abstract and theoretical approaches, calling attention to perceived student needs and ideas for pedagogical reform. Additionally, the early-career educators analyzed the various functions of technology and perspectives of learning as they contemplated ways to support agentive meaning-making. In so doing, they also applied knowledge creatively and appropriately despite curricular constraints as they looked to incorporate specific online programs, such as Khan Academy and Class Dojo, and as some banded together to introduce, integrate, and experiment with new approaches to teaching. In other words, the early-career educators’ evolving practices revealed their sensitivity to students’ needs and institutional standards, as well as their beliefs in digital demands and solutions. Collectively, through experiencing, conceptualizing, analyzing, and applying, the educators reconsidered and refined educational

philosophies clearly rooted in these four components of the knowledge processes. Additionally, as educators and students in a Reflexive Knowledge Society (Kalantzis & Cope, 2005), they evoked a confidence in collaborative, agentive, and multimodal learning. They seemed resilient to the technical challenges and evaluative norms that impacted their practice. Though Sharon admitted an “unfortunate reality” of the trade, the educators’ posts revealed their aspiration to include digital and non-digital approaches that honored individual, textured, and layered meaning-making.

Across all the chats, the early-career educators called upon their own experiences as former high school students, as current teachers, and as graduate students. Though they did not name educational theories, something they saved for formal assignments, the early-career educators included their understandings of seminal concepts. Reyna talked about scaffolding when she explained how students needed foundational knowledge to “take it to the next level.” Joseph, Soledad, and Darla addressed issues of engagement and problematized current educational structures. Sage and Rolland, among others, spoke about personal relevance and student ownership. Ralph addressed “the possibilities of connectivity, as we teachers are becoming gateways/facilitators, as learning from one person is now antiquated.”

Despite the constraints of their personal-professional bandwidth, the early-career educators were eager and excited to find technologies—and digital and non-digital approaches—to attend to their students’ needs. They were open to ideas, looked to each other for advice and empathy, and they evoked a passion and optimism of those who believed they could make difference. Even if considered naïve, their interest in “joining forces” and challenging existing structures (“shhh ... don’t tell my principal”; “ADHD is NOT an epidemic”; “She needs to LEARN life skills”) suggests that these educators perceived themselves as part of a grassroots movement to effect change. With the knowledge processes as a heuristic, these experiences, conceptions, analyses, and applications have come to the fore and have revealed the early-career educators’ heightened awareness of self, of pedagogy, of agentive collaboration.

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3

Collaborative Professional Learning and Differentiated Teacher Practice: *Learning by Design* in Greece

Eugenia Arvanitis and Chryssi Vitsilaki

The Learning by Design approach (Kalantzis & Cope, 2005) was introduced to Greece as a process for transforming teachers' professional learning by enabling greater collaboration and reflection on their part. This chapter presents an action research pilot project co-funded by the European Social Fund and the Greek Pedagogical Institute (MIS 295379) in 2011. The pilot program was implemented in 9 schools from three different localities (Athens, Patras and Rhodes) in Greece with a total of 43 participating teachers. The research data presented in this chapter capture reflective comments and survey findings which emerged during the initial, interim and final evaluation phases of the project (Arvanitis, 2011). Overall, teachers in the trial valued the process of working in school-based reflexive learning teams emphasizing joint planning, critical professional reflection (relevant to their daily work and student achievements) and sharing. Also, the professional exchange generated by Learning by Design and its social media affordances allowed teachers to reposition themselves and to rethink their professional learning as a series of spaces for professional communication, documentation and exchange that are live, asynchronous, reflexive, collaborative and multimodal. Finally, the explicit prospective and retrospective documentation of teaching methods, in other words the scaffolding and weaving of activities, was better understood as a means of differentiating teaching and documenting effective learning to harness students' diversity.

Introduction

The Greek National School Reform agenda introduced in 2010 (Act 3848/2010) was a promising start for opening up schools to modern educational practices (<http://www.minedu.gov.gr/neo-sxoleio-main.html>). Its aim was the design of a new national curriculum which would allow Greek teachers to act with greater autonomy as curriculum designers. Teachers were asked to undertake new roles as social actors and knowledge professionals. Transforming the role of teachers from that of being civil servants to being expert educators emerged as a great challenge for the Greek educational system. It was recognized that such phenomenal transformation could only

occur through a different model of professional training, which was indeed pursued. However, we must note that from its onset this reform was enveloped in an unprecedented social and economic crisis, with rapidly decreasing wages and public funding for education, and unfortunately teacher training and evaluation as a means of securing meritocracy soon came to be perceived as a threat rather than an opportunity for teacher professional development.

International research over the last decades (Cochran-Smith & Lytle, 1993; Darling-Hammond, 1993; McLaughlin & Talbert, 1993; Hargreaves, 1994; Fishman & McCarthy, 2000; Yoon et al., 2007; Darling-Hammond et al., 2009; Gulamhussein, 2013), affirms that the traditional training model of teachers must give way to the creation of interactive, collaborative and reflective professional learning communities, where teachers not only consume, but produce knowledge in a collective way. *Collaborative professional learning* is regarded as an important factor enabling teachers to function as members of a professional community and to construct a *collective intelligence* (Kalantzis & Cope, 2012) through the creation and sharing of knowledge and best practices, continuous feedback and reflection. It also can serve as a vehicle for educational transformation building on cultural diversity and the variety of perspectives and practices existing inside and outside the school community. Consequently, a fundamental challenge to education is to create conditions that facilitate the creation of professional learning communities (communities of practice), and thereby the production and distribution of knowledge among community members for securing effective student learning (Yoon et al., 2007; Darling-Hammond et al., 2009; Arvanitis, 2013; Gulamhussein, 2013).

Research evidence also supports the importance of school-based professional learning for enabling both reflective practice and collegial feedback in real class contexts, ensuring relevance to everyday practices and actual student learning. This way, schools can be seen by both teachers and students as learning organizations and places of reciprocal learning able to design and implement a comprehensive educational intervention. Every day collaborative professional learning becomes embedded in school life rather than being a supplementary activity (DET, 2005, p. 4; Darling-Hammond et al., 2009). In this context, the ongoing dialogue and reflection in the school community becomes a dynamic and complex component in the design and negotiation of learning. Teachers themselves emerge as designers of knowledge, engaging in transformational learning activities (e.g. new cognitive and metacognitive modes of analysis), multi-modal modes of meaning and well-designed learning processes based on experience, theory, analysis and application (Kalantzis et al., 2010).

International experience has also shown that the so-called 'communities of practice' approach can change teacher practice and increase student achievement (Dunne et al., 2000; Wiley, 2001). Overall, they contribute positively to the development of professionalism, creativity and innovation (Wenger, 1998) because they:

- facilitate the exchange, reflection, interpretation and sharing of information generating new ideas for everyday practices on an ongoing basis;
- maintain knowledge in a lively, customized and collaborative way, unlike a training manual;
- incorporate the informal aspects of knowledge that standard systems cannot conceive;
- form a totally new learning/training space where different identities and different social biographies (lifeworlds) can interrelate. Having a sense of identity and belonging in the process of learning is an important condition, enabling learners to classify and manage the new learning (Kalantzis & Cope, 2005); and
- ensure good communication by creating a friendly and collaborative learning environment.

Finally, research data shows that other educational systems, such as the Department of Education and Training of Victoria (Australia), have already developed a framework for highly effective professional learning which is: (1) focused on student outcomes; (2) focused and embedded in teacher practice; (3) informed by relevant research data; (4) collaborative and involving reflection and feedback; (5) evidenced-based and data driven; (6) integrated in school culture and (7) referring to an obligatory individual as well as collective responsibility (DET, 2005, pp. 14–16). Similarly, the USA Center for Public Education in its latest report on professional development (<http://www.centerforpubliceducation.org/teachingtheteachers>) highlights the importance for effective teachers to: (1) implement in real class context new approaches instead of simply learning them; (2) get involved in ongoing professional learning based on the assistance of coaches/mentors to acquire new skills; (3) be focused on their subject area and engage in instructional design and (4) apply critical thinking strategies in the context of professional learning communities.

In this context, the *Learning by Design* approach (Kalantzis & Cope, 2005) was in 2010 proposed as a model to transform professional learning in Greece. It was adopted as a pilot or hands-on intervention, with a view to determining whether such generic principles would transform the Greek teachers' role and consequently enhance students' learning.

In the following sections we briefly present the methodology adopted and some focal research data drawn from this pilot implementation.

Pilot project planning and methodology

The *Learning by Design* pilot project involved a total of 43 teachers from nine schools which were to engage in differentiated instructional design. More specifically, 15 primary school teachers were selected from schools in Patras to design lessons in Mathematics; 13 secondary school teachers were selected from schools in Athens to design lessons in Sciences; and

15 primary and early childhood school teachers from Rhodes were to design lesson plans in the areas of Social Sciences and Humanities.

Overall, this professional learning project was based on three fundamental principles of *Learning by Design*:

- The teacher is considered as the *designer and co-creator* of learning environments and modules to harness learners' diversity. His/her activities are based on an epistemological framework of 'knowing processes' (*knowledge repertoires*) or "forms of action," namely experiential, conceptual, analytical and applied (Kalantzis & Cope, 2012, pp. 238–253).
- *Teachers' professional learning* becomes a school-based activity embracing action research, self-regulation of training, and documentation of pedagogy and curriculum choices.
- *Effective student learning and performance* is evidence-based and data-driven (Arvanitis, 2011).

The Greek teachers were involved in an action research project between April and June 2011 (Mills, 2009; Noffke & Somekh, 2009; Mertler & Charles, 2011), where they had to:

1. plan (teams of 2–4 designed knowledge repertoires using the Learning Module software);
2. act/teach;
3. observe and redesign their modules;
4. reflect on their experiences.

Special attention was given for teachers to:

- align learning objectives and desired outcomes to the national curriculum standards;
- reflect on their professional work;
- work collaboratively with other professionals in the same or in other schools;
- differentiate pedagogical choices that actively engaged students;
- secure a *balance of agency* between them and their students;
- use new digital media platforms as spaces of learning and sharing;
- reflect on assessing students' performance (Arvanitis, 2011, p. 22).

A website (<http://neamathisi.com/learning-by-design>) was developed in the Greek language to support teacher's professional learning, providing resources, examples and references. As shown in Figure 3.1, a total of 22 Learning Modules for different learning levels were designed, taught in schools and uploaded on a sharable database (http://cglearner.com/learning_element/public_index?locale%5Bname%5D=%CE%95%CE%BB%CE%BB%

Figure 3.1 The Greek Learning Modules database

CE%B7%CE%BD%CE%B9%CE). More specifically, eight Learning Modules focused on Mathematics and Humanities respectively and six on Sciences.

For example, as shown in Figure 3.2, one work/module referred to *Sea Organisms* (http://coglearner.com/learning_element/show_both/753.html?) including a great variety of scaffolded activities for *experiential*, *conceptual*, *analytical* and *transformative* learning, such as a 3D tour of the local aquarium in Rhodes (<http://www.360vr.gr/Enidrio/>), brainstorming, conceptual mapping, electronic games using Smart Board interactive technology, etc.

Another module referring to *Mechanical Energy*, used a variety of experiments, graphical representations and mathematical equations (http://coglearner.com/learning_element/show_both/642.html?) (Figure 3.3).

Furthermore, a network of international, national and regional coaches/mentors was created, comprised of two international experts, one research associate and three academics (experts) for each subject area, responsible for providing specialized training and feedback. These mentors were engaged in frequent electronic and face-to-face communication with participants. Also, three regional peer meetings were organized during the initial, interim and final phase of the project, and one final national workshop was held where teachers presented their works.

Moreover, a multifaceted methodology was adopted for evaluating the pilot implementation in Greece, which was conducted in three stages—initial,

<p>ΣΧΕΔΙΑΣΤΙΚΟΣ ΧΩΡΟΣ ΕΚΠΑΙΔΕΥΤΙΚΟΥ</p> 	<p>ΣΧΕΔΙΑΣΤΙΚΟΣ ΧΩΡΟΣ ΜΑΘΗΤΗ</p> 
<p>Θαλάσσιοι οργανισμοί και η προστασία τους.</p>	<p>Θαλάσσιοι οργανισμοί και η προστασία τους.</p>
	
<p>Ευδοξία Μπαξεβάνογλου, Τσαμπίκα Δρακισού</p>	<p>Ευδοξία Μπαξεβάνογλου, Τσαμπίκα Δρακισού</p>
<p>Πίνακας περιεχομένων:</p>	<p>Πίνακας περιεχομένων:</p>

Figure 3.2 Learning Module on sea organisms

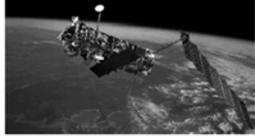
<p>ΣΧΕΔΙΑΣΤΙΚΟΣ ΧΩΡΟΣ ΕΚΠΑΙΔΕΥΤΙΚΟΥ</p> 	<p>ΣΧΕΔΙΑΣΤΙΚΟΣ ΧΩΡΟΣ ΜΑΘΗΤΗ</p> 
<p>"Μηχανική Ενέργεια"</p>	<p>"Μηχανική Ενέργεια"</p>
	
<p>ΑΝΑΣΤΑΣΙΑ ΣΑΡΑΝΤΟΠΟΥΛΟΥ, ΒΑΣΙΛΗΣ ΜΠΑΡΔΑΚΑΣ, Γιάννης Παγάζος, Eugenia Arvanitis</p>	<p>ΑΝΑΣΤΑΣΙΑ ΣΑΡΑΝΤΟΠΟΥΛΟΥ, ΒΑΣΙΛΗΣ ΜΠΑΡΔΑΚΑΣ, Γιάννης Παγάζος, Eugenia Arvanitis</p>
<p>Πίνακας περιεχομένων:</p>	<p>Πίνακας περιεχομένων:</p>

Figure 3.3 Learning Module on mechanical energy

interim and final. At the initial stage, teachers formed learning teams of 2–4 members, studied *Learning by Design* theory, and completed a preliminary questionnaire about their individual and professional characteristics. At the interim stage, they designed their teaching plans and responded to a second questionnaire assessing *Learning by Design* effectiveness with five criteria (i.e. *multimodality of their designs and the use of social media, curriculum alignment, effectiveness of assessment activities, scaffolding of activities and differentiated teaching to manage diversity*). They were also asked to fill in a reflective blog entry (with open-ended questions), commenting on their design experience. At this stage, teachers implemented their teaching plan in their classrooms. After teaching they made appropriate adjustments to the initial plans based on their observations regarding methodology, teaching material and assessment. Then, they were asked to respond to another survey and make another blog entry regarding their re-evaluation and improvement of their designs. At the final evaluation stage, teachers completed a final questionnaire (nine questions) giving their overall assessment of the value of the *Learning by Design* approach (Arvanitis, 2011, p. 25).

The project evaluation was conducted over a three month period. The participation rate varied from 53% to 76%, mainly due to the extra workload of secondary teachers (national exams, etc.). Overall, 24 to 34 teachers were involved in the various stages of the study. The research data in this chapter presents the reflections of 34 focus group participants regarding pedagogical choices, as well as individual reflective accounts triangulated with teacher surveys (Alvesson & Sköldbberg, 2000; Arvanitis, 2011; Arvanitis & Sakellariou, 2014). Content analysis was used for analyzing qualitative data (Kohlbacher, 2006), and descriptive statistics for analyzing survey results.

Summarily, the participants were in their majority (59%) female. Twenty three were primary school teachers, nine were upper secondary school teachers and two were preschool educators. Out of 34 teachers, three were school principals and three deputy principals. Overall, 20% of this group had up to 10 years of service, 38% had between 21–30 years and 42% between 11–20 years of teaching experience, revealing a combination of senior experienced teachers and younger professionals. Only a small percentage (9%) of the teachers felt “little” or “not so comfortable” with the use of technology, while the vast majority felt “comfortable” or “very comfortable.” However, their skills in using social media and new educational applications (educational software, etc.) came to be challenged in this pilot project (Arvanitis, 2011, p. 26).

Reflecting on current teacher practice

Research data identifies teacher quality as a key determinant in student achievement (Darling-Hammond et al., 2009; Gulamhussein, 2013), and accentuates high quality professional learning as significantly improving teachers’ effectiveness (DET, 2005, p. 2). Professional development in

Greece, however, was traditionally carried out mainly through centralized programs or one-off seminars, workshops and conferences. Manifesting this practice, all teachers in this pilot project had a rich record of traditional professional development activities. One third of them held masters' degrees in their area of expertise and one teacher had a PhD. The main problem with the traditional "one-size-fits-all" training is the top-down flow of information and the use of a *didactic* approach to teacher training (Kalantzis & Cope, 2012). In this model, teachers assume no responsibility in the production, design, management and evaluation of their training. Professional development serves mainly individual self-improvement, without direct relevance either to teachers' work in schools or to improving student performance. It is well documented that these kinds of programs have brought only ephemeral changes in educational/instructional practices, while their effectiveness has been called into question (Little, 1999; McRae et al., 2001; Hargreaves, 2003; Darling-Hammond et al., 2009; Arvanitis, 2013; Gulamhussein, 2013).

Teacher reflective accounts in this pilot project offered rich narratives of didactic and/or more participative pedagogical practices deployed in Greek schools today. Overall, this group of teachers contributed 165 comments on the following: (1) teaching methodology and overall pedagogy (71 comments or 43%); (2) teaching practices dealing with diversity (54 comments or 33%) and (3) evaluation techniques (40 comments or 24%).

Teaching methodology

Teachers in this pilot project described their teaching methodology as a mixture of *progressive* and *didactic* pedagogical practices (noted in 71 comments—43%). Their reflective accounts concentrated mainly on their overall teaching style and personal design methodology (32 comments—45%), placing great emphasis on teaching techniques and tools (39 comments—55%). Teaching style was characterized as being "student-centered" in about a half of the comments. One female teacher said "I try to detect children's prior knowledge to support them, but also to understand their weaknesses to act accordingly." More than one quarter of comments described teachers' pedagogy as "collaborative" and "flexible," inquiry-based and interdisciplinary and including student coaching, discussion and encouragement. Finally, almost a quarter of teacher comments described their pedagogy as "traditional" (*overt instruction*) and using a question-answer mode.

Moreover, the majority of teacher comments concerning instructional design methodology highlighted the fact that teaching and planning was dictated by the centralized and *mimetic* nature of the National Curriculum (Kalantzis & Cope, 2012, p. 267). Only a few teachers stated that their planning takes into account inquiry-based learning and team work aiming to enhance cooperation and interaction among all students. The most

common teaching tools named were textbooks, class computers or individual laptops, interactive whiteboards, internet and educational software.

Overall, these reflections show that teachers use a variety of methods, techniques and tools. Their instructional design methodology is largely restricted by the national curriculum (particularly the textbook). A lack of a comprehensive professional language around issues of methodology became clear from the use of general descriptors such as “student-centered,” “collaborative” or “flexible,” which in fact masked conventional and traditional practices (e.g. use of typical exercises and worksheets). This can be explained by the fact that the teachers in the course of their career were not given opportunities to discuss these issues in school-based learning teams and to develop an explicitly documented and analytical meta-language. The pilot project did bring this dimension to their professional learning, as we will see below.

Dealing with diversity

A second area of our inquiry related to the typical strategies teachers apply in class for addressing student diversity (noted in 54 comments—33%). In this area, more than a quarter of the teachers attested to the use of a “flexible strategy” for taking student needs into account. They stated that through continuous student monitoring, they come to alter learning objectives and content when necessary, taking into account both the personal characteristics of each student (learning style, cognitive status, family and social environment) as well as the learning goals set by the curriculum in their efforts to help students understand new knowledge with appropriately designed activities. About 25% of the comments made reference to ‘teamwork’ as a common approach to differentiated instruction, supplemented by the use of a variety of stimuli (audio, visual, tactile, etc.), and urging children to express themselves in a variety of modes (theater, visual arts, oral communication). Teachers reported that they differentiated their instruction to take into account learner personalities and cognitive interests by engaging them in teamwork. Finally, in about a third of the comments the teachers reported “individualized teaching” in the form of using differentiated worksheets, questions and training in line with the particular needs and abilities of each student. Despite the use of terms such as “teamwork” and “individualized teaching” it seems that collaborative practices were largely overlooked. For example, teamwork was largely perceived on a narrow basis and it was associated with traditional question-answer techniques.

Overall, it seems that these teachers try to manage diversity in the classroom only circumstantially, but from their comments it emerges that the majority do not have a clear understanding of the concept, as is exemplified by one teacher’s statement that differentiated teaching has to do with disabilities and dyslexia.

Assessing learning

Finally, 40 comments (24% of the total) were focused on assessment methods and tools teachers use in their everyday practice. Over a quarter of these comments focused on the assessment methodology and almost three quarters on the assessment tools. Teachers described in general terms the deployment of initial assessment (the recording of socio and family characteristics “to ascertain students’ cognitive skills and interests”), formative assessment (written and oral tests) and summative assessment (comprehensive exams). No further explanations were given about the process of documenting and assessing student performance and competences. Student performance criteria usually referred to: “(1) students’ participation in the teaching—learning process; (2) students’ diligence and interest; (3) students’ successful completion of worksheets in class (4) and the work done at home for further consolidation of the new learning.” Assessment was far from being a collective process, as this was dictated by the National Curriculum and textbooks, with teachers having little impact. According to teacher comments, an important dimension of assessment methodology was to evaluate whether “course objectives were met” or “why some students fail,” mainly through “tests, oral examinations, book exercises and activities.” Assessment was generally viewed as “part of daily school work in the classroom” as “it offers the possibility to explore the difficulties faced by students, ascertain their performance and modify the teaching approach.” Generally, it appears that this group of teachers, with very few exceptions, used conventional assessment techniques, largely dictated by the national curriculum without using rubrics to record competencies. Similarly, assessment tools used were mostly repetitive tests and assessment sheets (found in textbooks or devised by them). Observation, games, student self-assessment, portfolios or peer assessment activities had little application in real class context.

Teacher surveys: towards a collaborative professional learning

The teachers participating in the pilot project were very receptive to the opportunity to implement a new theoretical framework (the *Learning by Design* pedagogy) and to utilize new technologies for collaborative instructional design. Survey data documented their willingness to assume collective responsibility for their professional learning. The following two sections present teachers’ preliminary/post-teaching and final evaluation of the approach.

Preliminary and post-teaching survey

Teachers were involved in a peer-evaluation process to assess their Learning Modules in two stages: (1) after their initial design and (2) after teaching

and redrafting their Learning Modules. This was a unique opportunity for them, as it required collaborative reflection on the planning process applied and peer reviewing. According to teachers, the use of the Learning Module software and pedagogy was very helpful in developing their overall planning. Their responses were recorded on a simple assessment rubric of five evaluation criteria and a rating scale of 1–5. The following table presents the average scores of post-teaching evaluative responses on five criteria, which were improved compared to the preliminary ones, thus showing higher satisfaction and better familiarity with *Learning by Design* theory and software (Table 3.1).

More specifically, teachers after the implementation phase felt more comfortable with *the use of social media and multimodal affordances* in making meaning (average 3.42 compared to 3.04 in the preliminary phase). The use of multimedia and multimodality has proven a strong element of the design process, according to three quarters of teachers who described it as “outstanding,” “excellent” and “very good.” One teacher said “we used many different media, such as computers, internet, power point, photo, video, books, board, educational games, etc.”. However, there was a widespread concern about the lack of interactive technological equipment in Greek schools.

In addition, in the post-teaching phase, teachers were extremely positive about the assistance provided by the Learning Module web technology in setting *knowledge objectives* and aligning them to curriculum standards (average 3.42 compared to 2.96 in the preliminary phase). As research shows, teachers only occasionally develop learning activities that are explicitly linked to curriculum. They tend to prefer experiential learning or theory, rather than analysis and application of knowledge (Cloonan, 2007; van Haren, 2007; Suominen, 2009). The vast majority of the Greek teachers came to affirm that alignment to curriculum and relevance of the objectives

Table 3.1 Comparing initial design: post-teaching averages

	Average rating initial design (N= 26)	Average rating post-teaching design (N=24)
Multimodality & multimedia	3.04	3.42
Clarity & alignment of objectives with curriculum	2.96	3.42
Effectiveness of assessment tasks	2.77	3.17
Scaffolding of activities	2.69	3.08
Managing diversity	2.60	2.92

was “outstanding,” “excellent” and “very good” (92% of positive responses compared to 69% during the preliminary phase). One teacher said, “the objectives we set were clear and were similar to those of our students, meeting curriculum criteria.” However, they seemed skeptical about the level of difficulty of the activities in relation to the objectives. They thought that fewer goals were needed in certain cognitive processes (such as applying and analyzing processes). They were also uncertain about including cause and effect activities in analyzing processes or using certain terminology in conceptualizing. These concerns sparked more professional reflection and ongoing discussions within teacher learning teams.

Moreover, teachers felt that their assessment activities were very appropriate for their learners and resulted in better *knowledge outcomes* (average 3.17 compared to 2.77 in the preliminary phase). The great majority of participants (83%) were positive, while the diversification and customization of assessment activities was very well received by their students.

Furthermore, the combination and scaffolding of different types of activities representing the range of *knowledge processes* (average 3.08 compared to 2.69 in the preliminary phase) also emerged as an important element in teachers’ post-teaching evaluation. The opportunity to study and adopt a well-structured pedagogical framework in framing their activities was positively assessed by the great majority (83%) of teachers. “Learning, because the instructional design became differentiated, was extremely rewarding for students,” said one teacher. “It kept students motivated and actively engaged in all phases of teaching,” pointed out another teacher. However, it appears from some comments that there was an ongoing discussion about what they would have changed if they had to redesign certain activities because of the difficulty of applying them in the classroom. Also some teachers were skeptical about what could have been added to improve multimodality (e.g. with more tactile representations). These points generated further professional interaction.

Finally, the usefulness of the *Learning by Design* approach in managing the diversity of students and implementing differentiated instruction (average 2.92 compared to 2.60 in the preliminary phase) was less evident in teacher responses. There was a significant group of participants (33%) who stressed that the approach simply “meets the criteria” or that “it needs improvement” without any further explanation. This reveals that identifying diversity and dealing with it effectively remains a thorny issue within the Greek classroom.

Final survey

A final survey was conducted at the end of the project, illustrating even greater satisfaction in using the *Learning by Design* approach, as is shown below (Figure 3.4).

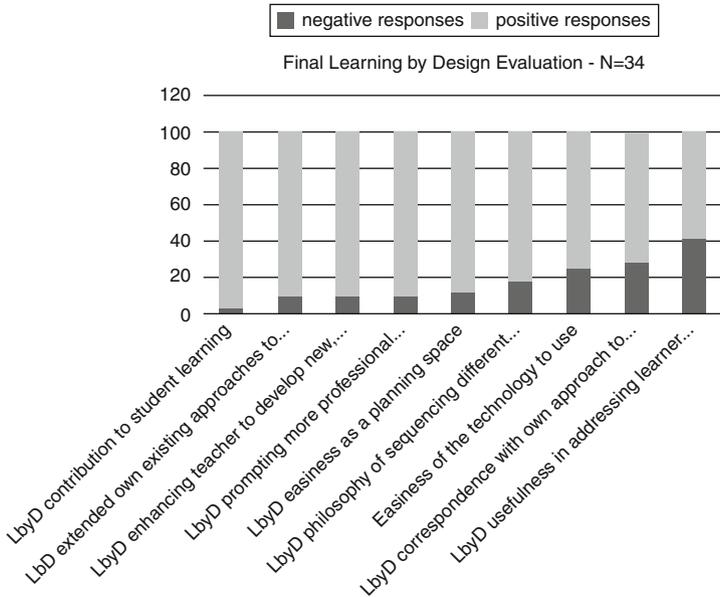


Figure 3.4 Final Learning by Design evaluation

Overall, teacher satisfaction centred on the following nine criteria:

Students' learning

Almost all teachers (96.88% positive responses) said that *Learning by Design* contributed significantly to student learning, as expressed by the observed high levels of students' comprehension of and interest in the lesson. Also, this approach provided an opportunity for everyone to "get away from the textbook as a sole reference point and deal with many experiential activities," as one teacher said. "*Learning by Design*," concluded another participant, "enables the teacher to be flexible in setting objectives and modifying the level of difficulty of different activities. The ability to adapt to the level of students significantly contributes to learning," he concluded. Teachers' positive assessment of *Learning by Design* was derived from the fact that students participated more actively and showed "high levels of success in the assessment sheets." However, some teachers were not sure whether learning outcomes could be attributed to *Learning by Design* alone or to other intervening factors.

Expanding teaching repertoires

The vast majority of teachers felt that *Learning by Design* extended their repertoire of teaching approaches/methods (90.62% positive responses). One teacher said, "I relied on this model to design with greater accuracy and to

document my teaching options. So, I feel more confident about the final result and the achieved knowledge objectives.” They also stressed that their teaching approach was enriched with new types of activities and a new perspective on evaluation. “The recording and documentation of methods made clear from the beginning what should be done, in what order and when,” stated another teacher. Some comments highlighted the usefulness of *Learning by Design* in designing projects for lengthier teaching sessions in primary school settings, as, for example, in the so called “flexible zone” where integrated and interdisciplinary learning takes place. Finally, a very small group (9.38%) said that *Learning by Design* did not expand their teaching methods at all, as they had already integrated similar techniques in their teaching.

Professional relations with peers

Teachers were asked about the role of *Learning by Design* in shaping new, different or additional relationships with their colleagues and the vast majority (90.62% positive responses) answered that it contributed immensely to collaborations (even though some of them had already experienced joint planning). Collaboration between teachers improved at both professional and personal levels because of the time learning teams spent together in designing their teaching modules. As one teacher noted, “collaboration with colleagues was the best part of the whole process. We worked in groups, discussed, exchanged opinions and generally worked in a very creative environment.” Another teacher stated emphatically: “we proposed solutions to problems that emerged and we were correcting each other when necessary.” This way of working was affirmed as preferable for future training and school-based learning to facilitate best practice and sharing of materials. “I was given the opportunity to work with people who have the same concerns and considerations, and indeed we drafted work projects, which are of common interest,” one teacher said. Only a very small group (9.38%) of participants said they experienced little collegial interaction.

Professional interaction

On a similar note, teachers commented on the effectiveness of the *Learning by Design* approach in facilitating deeper professional interaction and peer learning. The vast majority of teachers (90.62%) expressed a positive response to this. “Although my relationships with colleagues were already excellent, the professional cooperation was limited to some questions and advice. It was the first time that we designed a learning module together, and of course we all benefited from it,” emphasized one teacher. Overall, the feedback from teachers showed that there was systematic professional cooperation and reflection. Teachers were involved in the process of continuous feedback and evaluation of their work. “My team colleagues saw the work I had done and gave me recommendations to improve it,” said one teacher.

In many cases this school level cooperation was considered very constructive. “In the Greek school there is no chance to interact with colleagues.”

Learning by Design “enabled cooperation in groups, which had direct effect on professional interaction,” said one teacher. Another one said, “in our school we were running another project with two other female teachers, so we had common topics of discussion, the same questions to answer, and the same concerns to deal with. This in fact took place in the staff room so other colleagues participated too, out of curiosity.” However, teachers noted the need for greater collaboration with colleagues from different regions in the context of the pilot project. A teacher supported that “*Learning by Design* initiated positive interaction with colleagues and forged staff relationships in my school because we worked as a team, but we had little communication with colleagues from other schools, beyond the limited meetings we had as a wider network in our region.” Again, only a very small group said that this approach had little effect on their professional interaction.

Learning module planning space

Learning by Design, in the view of the great majority of respondents (88.24%) offered a very useful planning space for teachers. As one teacher said, “it enables you to set individual goals and then to design activities that focus on these objectives.” Teachers stressed that their professional learning had been significantly advanced by this model. They found the instructional design “interesting and innovative,” “comprehensive and systematic.” They also felt that scaffolding of activities (knowledge processes) was very helpful for the systematization of their teaching, as was the graphic representation of the *Learning by Design* pedagogy (<http://neamathisi.com/learning-by-design/pedagogy>). One teacher stated that this graphic “guided my teaching plan as I felt comfortable acting on the basis of an integrated theory.” However, a small group of teachers (11.76% of responses) said the web planning space had “very little” or no usefulness because “it was not easy to use.”

Scaffolding of activities

The great majority (82.35%) of participating teachers found *Learning by Design* pedagogical theory (the idea of sequencing different *knowledge processes* or activity types) very useful, “although hardly anyone could use it to design all subjects for everyday instruction.” Apparently the Greek curriculum is crowded with subject-specific lessons. This prevents teachers from adopting a cross-subject topic, collaborative and problem solving approach in their everyday instructional design. “*Learning by Design* clearly facilitated teachers in planning larger projects and for a longer period of time” stressed one teacher. “Of course the practical value would be even greater if a large data base of Learning Modules existed, providing us ideas and activities” said another one. *Learning by Design* appealed to this group of teachers for its practical value in supporting the design of learning scenarios. “The learner goes from the familiar to the new, from an easy task to a more difficult one within a smooth and scaffolded process. That way even the weakest student can follow,” said one teacher. At the same time participants emphasized that

through this theory teachers learn to use “several types of activities in all eight learning processes,” “deepening their teaching in functional analysis, for example, which is not usual.” Negative comments (17.65% of responses) focused on the fact that the design process is time consuming and that it is difficult to implement the *Learning by Design* approach for every lesson on a daily basis because of the Greek Syllabus restrictions.

Usefulness of social media technology in instructional design

Another issue in the final evaluation was the usefulness of social media technology. For 75% of participating teachers, technology had a positive effect on instructional design. As one teacher explained, “once someone becomes familiar with the philosophy of using online tools, everything becomes easier,” even though “there are areas that need improvement.” One quarter of teachers noted that the use of technology was “little” or “not at all easy.” “Many times the system had a very slow response or crashes and/or it did not respond to commands (mainly in uploading image files, video, audio),” one teacher said. Some teachers focused on the nature of work in an electronic environment. For example, it was reported that “it would be preferable if the working interface and corresponding tabs could be framed in a panoramic view so that someone could fill them in instead of looking back and forth in different interfaces to add or remove materials.” Generally, teachers felt that “careful attention needs to be given to the software application because of its relative complexity.”

Relevance to personal teaching approach

Almost three quarters of the participants (71.89% positive responses) found the *Learning by Design* approach relevant to their teaching philosophy because it expanded and enriched their instructional planning. One teacher said that “familiarity with this theory helped me enrich my teaching method and design different activities and types of evaluation.” Overall teachers felt that *Learning by Design* is very well organized as a model and “it supports the constructivist approach, which is adopted by our national curriculum,” as one teacher said. Teachers expressed a desire to continue using this model in the future. However, over a quarter of teachers (28%) said that this approach has little relation to their usual practice, because, as one teacher said, “so far we have learned to use mainly the teacher’s guidebook, which sets out the objectives and activities of each class. Therefore there is little need for us to design our lessons.”

Addressing differentiating instruction

Finally, the effectiveness of *Learning by Design* in addressing learner diversity and differentiating instruction had comparatively fewer positive responses from the teachers. Nonetheless, the majority (59%) of the respondents pointed out that *Learning by Design* was “very useful” or “so-so” in dealing

with differentiated instruction, mainly through learners' collaborative work and scaffolded teaching activities. One teacher said "my teaching was based on creating heterogeneous groups that provide support to their members. Also, when it is possible, I applied differentiated or even individualized instruction. *Learning by Design* gave me the opportunity to create more activities targeted to specific students." Finally, one teacher said that "the multiple objectives helped even weaker students." However, about 41% of the teachers reported that the effect of *Learning by Design* on differentiating their instruction was "limited" or "not existent." This was mainly because they felt they did not have to differentiate their teaching as "all students responded equally" or because they already applied similar strategies.

Concluding remarks: shifting the paradigm of professional learning

Reflexive, collaborative and work-embedded learning is essential for creating well-trained professionals. Professional learning should be an ongoing, lifelong and life-wide experience, supplemented by other forms of learning such as informal professional exchange, structured mentoring programs led by experienced members of the staff, coaching, one-to-one learning, and finally, other seminars and external learning activities coupled by school-based process to test their effectiveness.

Frameworks of differentiated instructional design and creative professional learning, such as *Learning by Design*, create new spaces of learning, reflection and identity as professional practice moves away from its traditional or *didactic* paradigm to a more *inclusive* one. The *Learning by Design* pilot implementation in Greece showed that familiarity with new collaborative approaches, professional peer learning and practical application in real school contexts helped to improve teachers' perception of their professional learning, and the effectiveness of their teaching practices. The *Learning by Design* inclusive pedagogical approach and social networking applications, as survey data and reflective accounts revealed, offer a paradigm of transformation in schools by supporting teachers' collective responsibility for effective professional learning. Teachers become active researchers and lifelong learners within a collaborative and reflective school community. This breaks down the isolation and the bureaucratic role that Greek teachers traditionally have experienced.

The following generic points summarize the value of the *Learning by Design* approach, as demonstrated in the pilot project evaluation in Greece.

Working in reflexive learning teams

Our research data supports the proposition that effective professional learning teams are important part of "developing a culture of collaboration and collective responsibility in schools" (DET, 2005, p. 9) deepening professional

interaction. According to the pilot project results, *Learning by Design* adopts a team-based approach to professional learning, enabling exchange of insights into professional practice and peer learning, instead of individual lesson planning. Teachers do not just work alongside colleagues, but they engage in joint planning and critical reflection. They share ideas and expertise that are directly relevant to their daily work and to student achievement. They work in a specific action research model that encompasses prospective documentation of learning plans, application in the classroom, then evaluation and refinement through retrospective documentation (e.g. the redesign of lesson plans). Their professional learning is focused on both improving student achievement by collecting and analyzing student learning data, and differentiating their instruction to improve learning outcomes. In this way, teachers act as *reflective practitioners* and *problem-solvers* who engage in an ongoing process of inquiry and deep collective learning. Effective coaching and leading of professional learning teams, though, remains an important challenge for the Greek education community to ensure collaboration and sharing.

Rethinking (professional) learning space

New media technology (social software or web 2.0), such as that of Learning Module software, offers new collective and enriched spaces (Barab et al., 2004) of live, asynchronous, reflexive and multimodal professional communication, documentation and exchange. Thus, it expands the traditional professional training sites to a working space where “internet time,” “knowledge management” and collective learning, matter. The *Learning by Design* approach perceives *knowledge as action* in different social, academic, educational and training contexts (Kalantzis et al., 2010). Here teachers act as designers and active producers of knowledge, documenting their practice in both prospective and retrospective ways. In this context, professionals can collaboratively engage in learning experiences at their own pace and differentiate and deepen their multimodal pedagogical choices. Overall, when working in such intermediate spaces of reflective practice, teachers produce new narratives of self-transformation, identity and professional growth. However, some in our group of teachers felt less comfortable with this new space of professional learning.

Documenting (differentiated) pedagogical choices

Teaching is evolving from a didactic/oral profession into a profession of documenting a divergent learning ecology (Burrows, 2005; Kalantzis & Cope, 2012). Research findings have shown that careful (*prospective and retrospective*) pedagogical planning helps to assess teacher effectiveness, as reflected in the results of their students (Burrows et al., 2007; Cloonan, 2007; van Haren, 2007; Neville, 2008; Suominen, 2009). This point was also verified by our pilot study findings.

As shown by the final evaluation survey *Learning by Design* provides an effective and clear epistemological framework for instructional planning that: (1) enhances student outcomes and engagement; (2) can be explicitly aligned with formal curriculum standards, allowing teachers to clearly define and achieve learning goals; (3) can be relevant to teachers' own pedagogical practice and also expand their repertoires enabling the scaffolding and "weaving" of learning activities and (4) respond to culturally heterogeneous classrooms and differentiating teaching (Luke et al., 2003; Cazden 2006). It is for all of these reasons that an increasing number of academics and teaching professionals are systematically pursuing its adoption by greater segments of the educational community throughout Greece.

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4

A Learning by Design Journey

Murray Bruce, Prue Gill, Shane Gorman, Sue Gorman, Peter Henry, Robyn Kiddy and Rita van Haren

This chapter tracks the journey of the Lanyon Cluster of Schools as it grows into a vibrant, collaborative and innovative learning community. A crucial part of that journey was to incorporate the Learning by Design framework as our pedagogical framework in order to develop teachers' capacity to design and implement quality teaching, and improve student learning outcomes. Learning by Design has provided us with a shared language and pedagogy, connecting students, teachers and schools, and ensuring learning is engaging, inclusive and transformational. It underpinned a professional learning community where collaborative planning and action learning became part of our everyday practice. Learning by Design also allowed us to enact and embed network and system initiatives, while maintaining constancy of direction and purpose.

Setting out

In 1993 a small group of schools in the southernmost suburbs of the Australian Capital Territory began a journey in learning. These schools, Tharwa Primary School, a small rural school, Bonython Primary School and Gordon Primary School, began a collaborative partnership with the simple ambition of sharing both learning opportunities for teachers and students, and the precious resources available to schools. As we reflect on this journey, we can see that underpinning all our work is a strong vision, sense of purpose and direction. From the outset, the vision was clearly about sharing our resources to improve outcomes for students and create a collaborative culture.

In 1993 the principals of the three Cluster schools were asked to participate in the Lanyon High School Think Tank. Community input was sought to inform the design, building and “operational platform” of Lanyon High School. A new vision for high schools in the ACT was at the heart of this process and the think tank looked at the work of William Glasser and Quality Schooling (1990, 1992), as well the National Schools Network (begun in 1991) and the Coalition of Essential Schools (Sizer, 1984).

As this process continued into 1994, Charles Conder Primary School opened, followed by Lanyon High School in 1996. This essentially completed the Lanyon Cluster of Schools. This fact was celebrated with the inaugural Cluster executive conference. Included on the conference agenda was the creation of a Cluster strategic plan, structures to support the plan, professional learning, teacher mobility across the Cluster, and continuity of curriculum across the primary and secondary sectors. If we add, from the High School's Operational Principles, "cooperative planning and development," "open communication across the cluster" and a "consistent student management policy and procedures," we have the essence of today's cluster.

The annual Cluster executive conference still has, as its core business, a focus on the strategic plan. At this conference, the executive, the principal and deputy of each Cluster school, reflect on the achievements of the year and set new directions. This constant reflection and refinement of the vision and strategic direction of the Cluster has been essential to ensure the work remains connected and focused. Over the 19 years since that first conference, the vision has evolved into the following (Figure 4.1):

We collaborate to achieve a culture for the success of all through:

- Continuous professional learning to ensure a quality learning environment and improve student outcomes.
- Learning that engages, motivates and values students as individuals.
- Educational programs of high intellectual quality designed to challenge and support students.
- Learning that is connected to real-world issues which are significant in students' lives.
- Equipping students for global citizenship.

The Lanyon Cluster Model represents the five dimensions of the Cluster work. The strong vision, leadership and collaboration were evident early on with the establishment of the Cluster executive and their regular meetings and annual conference. In 2007, special interest groups such as Literacy, Maths, Learner Assistance, Languages Other Than English, Transition (from primary school to high school) and Information Communication Technologies were formed. These groups not only embedded a focus on collaboration across schools, but also heralded the beginnings of a focus on pedagogy.

It was no accident then, as these special interest groups met to find ways of improving practice, that a focus on evidence and data would develop. This focus and a desire to improve the outcomes for students, with approximately 30–50% of students identified as coming from a low socio-economic background, that the Cluster really began to emphasise teacher pedagogy as the focus of improving student learning outcomes.

Teachers make a significant difference to student outcomes (Hattie, 2003; Darling-Hammond, 2011). In an environment where schools in the new

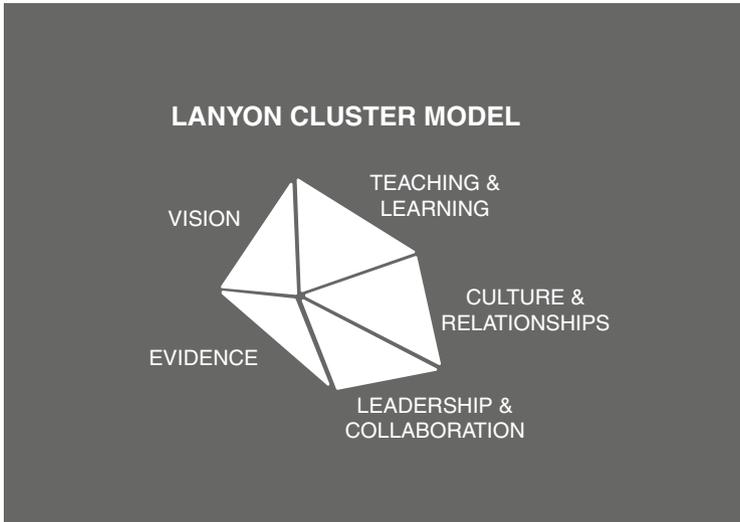


Figure 4.1 The Lanyon cluster model

suburbs of the Lanyon valley struggled to attract and maintain teaching staff, and where the majority of teachers were new educators, it became evident to the Cluster executive that building the capacity of teachers was critical to success. As part of the process to develop the pedagogical skills of teachers, Cluster staff meetings were instituted in 2002. The focus then, as it is today, was professional learning, direction setting and professional sharing. A Cluster planning day for teachers at the beginning of every year is also a feature of the professional learning calendar.

In 2002 a number of significant professional learning events occurred that proved to be pivotal in the development of the Cluster. One was the Cluster Executive's introduction to *Productive Pedagogies* (Lingard et al., 2001). *Productive Pedagogies* is a teacher reflection tool, strongly grounded in research undertaken in Queensland schools. Representatives from each school, including the principals, analysed the pedagogy in their schools using the dimensions of *Productive Pedagogies*. It was determined through this process that "Intellectual Quality" need to be addressed in teachers' practice, followed closely by "Recognition of Difference."

Later in the year, Bill Cope, then at the Royal Melbourne Institute of Technology (RMIT) University, presented a workshop on *Multiliteracies* (New London Group, 2000). Cluster schools were well represented at this workshop, and were inspired by its focus on diversity and pedagogy, as well as its forward-looking ideas about multimodal meaning-making. They came away believing they had found a framework that, when applied to the collaborative structure of the Cluster, would achieve their vision and meet the

dual needs of improving both teacher practice and student outcomes in a consistent and coherent way.

In 2003 the Cluster Executive established the “Lanyon Cluster Literacy and Numeracy Project.” It included each school identifying key teachers to lead the work in their schools. These leaders would meet regularly to plan, reflect on and guide this work. The focus on pedagogy and using an evidence base to inform practice took a step forward with this project. Cluster schools funded, with support from the system, the release of teachers to actively plan and reflect on teacher practice with student learning at the core. At Tharwa Primary School, for example, the aims of the project were about increasing professional dialogue, mapping teachers’ practice against the *Productive Pedagogies* dimensions, and targeting literacy and numeracy professional learning.

For the first time the Cluster was operating through the five dimensions of the cluster model. The vision was underpinning the work; the strong leadership and collaborative structures supported teachers to use an evidence base to focus on teaching practice, and now, with *Multiliteracies* and *Productive Pedagogies*, there was a shared language and pedagogy for teachers.

At the shared Cluster planning day early in 2004, Bill Cope presented a workshop for all Cluster teachers. The focus was on the *Learning by Design* framework which translated the *Multiliteracies* theory into practice. While the *Productive Pedagogies* dimensions gave teachers a guide to “*what*” effective teaching and learning looked like, the *Learning by Design* framework was essential as it provided us with the “*how*” to achieve transformative learning for our diverse student population.

While this workshop motivated teachers and gave them a framework for planning quality learning, the issue was still to provide the ongoing professional learning that educators, particularly new educators, needed to become familiar and confident with the language, pedagogy and structure of the *Learning by Design* framework. In 2004 the Cluster addressed this with the appointment of a Cluster deputy principal. This innovative collaboration created a position, funded in part by the Department of Education and partly by each of the Cluster schools, with the primary role of building teacher capacity, implementing *Learning by Design*, and managing the Lanyon Cluster Literacy and Numeracy Project. This was our first year of creating Learning Modules using *Learning by Design*.

This work continued into 2005, with Mary Kalantzis, then at RMIT, presenting at the Cluster planning day and also introducing action learning projects through an Australian Research Council (ARC) project. This ARC project facilitated Cluster schools to offline teachers to plan, write, implement and reflect upon *Learning by Design* Learning Modules. It also provided ongoing professional learning for teachers. While individual teachers were offline, they worked with their teaching teams to implement these Learning Modules, thus engaging a broader audience in the learning. Teachers

presented their action learning projects locally and nationally, setting the scene for many other projects that have had *Learning by Design* at their core. Each of them has their own particular focus, enriching the work and engaging teachers and students in *Learning by Design*. Today all teachers undertake action learning to reflect on and use evidence to inform their practice.

The *Learning by Design* framework is now embedded in the Cluster. We have a shared pedagogy and language of practice that enables teacher growth and drives better outcomes for students. The ongoing work of the teachers in the Cluster, supported through professional learning, collaborative planning, reflective practice and action learning, ensures learner transformation and has a strong futures focus. Further, it seamlessly aligns with network, system and national initiatives. As this story unfolds you will discover that, by having the *Learning by Design* framework at its heart, the Lanyon Cluster of Schools has been able to continue to collaborate and innovate, while keeping schools, teachers, and students connected and focused on learning.

Shared language and pedagogy

“You can find the practice of teaching in action everywhere in everyday life. In fact it is impossible to imagine everyday life without it. Teaching and learning are integral to our life as humans.”

There is also a science to education, which adds method and reflexivity to the art of teaching, and is backed up by a body of specialist knowledge.

(Kalantzis & Cope, 2012b, p. 1)

The focus on pedagogy has been at the heart of our *Learning by Design* journey. If teachers are the most important influence on student outcomes then it is important that they have a clear understanding of both the art of teaching and the science of education. It is just as important that they are supported to learn, to plan, to share, to discuss and reflect upon their practice. The Lanyon Cluster realised the importance of establishing a shared understanding of pedagogy and the means to keep learning about and engaging in professional discussions about pedagogy. So we needed a framework that had a strong pedagogical base. This was *Learning by Design*.

“As an early years teacher I still thank my lucky stars that I landed in a cluster with such a strong, reflective and supportive pedagogical environment.”
Shannon Beck, Teacher

This quote by a teacher at Lanyon High School points to the Cluster focus on pedagogy and reflection. Early educators, like Shannon, often arrive in the Cluster with a very strong sense of the art of teaching and some understanding of the science of education. However, for the professional teacher to be able to articulate the science of education, they need a language to



Figure 4.2 Teachers collaboratively planning with *Learning by Design*

describe what they do. For this to happen you not only need a complete, rigorous and coherent pedagogical framework, but also the structures in place to support teachers to learn, to plan, to share and to reflect on their practice.

All of the structures that the Cluster put in place, from the Cluster executive to the coaching sessions and the action learning projects, have been woven together to form a dynamic professional learning community. Every time teachers and leaders meet to plan, to learn, to discuss and reflect, they are able to use *Learning by Design* to define the work and to articulate clearly their problems of practice. They are able to deeply question and investigate their practice with a clear and shared understanding.

Learning by Design provides the clearly defined language and pedagogical framework that has opened up classrooms, de-privatised practice and enabled the emergence, across all Cluster schools, of the “collaborative professionals whose knowledge and experiences are always shared” whose “every pedagogical word is transparently on the record and open to scrutiny” (Kalantzis & Cope, 2012b, p. 57) (Figure 4.2).

Building teacher capacity

The Cluster vision included the notion that curriculum be cumulative and coherent (Freebody et al., 2008) from preschool through to year 10. Cumulative learning is the transfer of knowledge between subjects/disciplines as well as building on knowledge over time, from one school year to

the next. Therefore the Cluster Executive determined that the curriculum content, teaching methods, language of instruction and assessment practices should be as consistent as possible. *Learning by Design* was central to this as it enabled teachers to build on curriculum, using a shared language and pedagogy. This also supported student learning from year to year and at significant transition points, particularly from primary school to high school where typically there were not strong pedagogical links and, as a result, there is a decline in achievement for many students (McGee et al., 2003). Building teacher and leader capacity has been essential to address this.

Building capacity of leaders

In order to build the capacity of leaders, including principals, to lead the *Learning by Design* work, the Cluster Executive initiated “Cluster Coaching and Mentoring” sessions each term, involving principals, deputy principals, executive teachers and coaches from all of the Cluster schools. Our focus at these meetings was to deepen each leader’s understanding of quality pedagogy and develop leadership strategies. Initially, the focus was on *Learning by Design* and the Quality Teaching model, a new iteration of Productive Pedagogies. As these became embedded, we moved to assessment and classroom observations through instructional rounds.

We read and discussed *Teachers and Schooling Making a Difference* (Hayes et al., 2005), *New Learning: Elements of a Science of Education* (Kalantzis & Cope, 2012b), *Instructional Rounds in Education: A Network Approach to Improving Teaching and Learning* (City et al., 2009), *Literacies* (Kalantzis & Cope, 2012a), *Embedded Formative Assessment* (William, 2011). To model quality pedagogy, we designed the discussions using the *Learning by Design* framework so that our school leaders could connect the new learning to their own lifeworld experiences, analyse new concepts, and explore how these might be applied in their own practice (Figure 4.3).

Building capacity in literacy and numeracy

To provide deep knowledge of literacy and numeracy, the *First Steps* reading and writing resources (Department of Education of Western Australia, 2013), the “Count Me in Too” number program (NSW Department of Education, 2009) for kindergarten to year 3, “The Middle Years Mental Computation” resources (McIntosh & Dole, 2005), and later the “Big Ideas in Number” resources (Siemon et al., 2006) were adopted as the key resources for year 4 onwards. These were all well-grounded in research and endorsed for use in ACT schools. The Lanyon Cluster has consistently facilitated comprehensive professional learning for teachers in using these resources. The professional learning programs are undertaken collaboratively by the Cluster schools and are usually delivered at Cluster school sites.

Having determined the resources that would support the building of coherent and cumulative teaching and learning in literacy and numeracy,

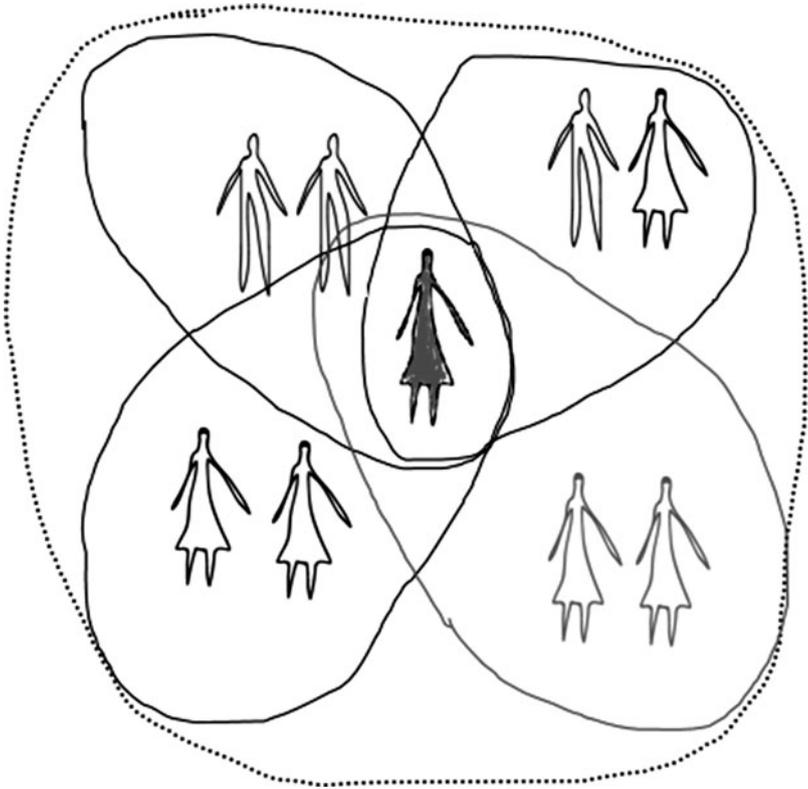


Figure 4.3 The Cluster's vision in developing leaders is represented here with a leader developing other leaders in each cluster school

the next challenge was to ensure they were implemented successfully. Teachers were actively supported in implementing the teaching programs by collaborative planning processes using the *Learning by Design* framework, discussion of implementation in professional learning teams, coaching, mentoring and supervision. *Learning by Design* was important in implementation to ensure the elements of the Quality Teaching model were addressed. In particular, this included addressing the needs and diversity of all learners in their classrooms.

The literacy and numeracy professional learning was highly significant to enable teachers, particularly early career teachers, to develop sound pedagogy and to quickly come to grips with the complexity of effective classroom teaching. The sustained focus on these programs has resulted in better quality teaching and far greater consistency of instruction than might normally be expected of early career teachers.

Building capacity through personalised professional learning

Our focus on professional learning has continued to evolve as we try to adapt and personalise learning for teachers with their different levels of experience and length of time working in the Cluster. This is evident in the 2013–2015 model of professional learning which has been developed collaboratively by the Cluster schools to personalise professional learning for teachers and leaders. This program suits the needs of each Cluster school and of each teacher within the schools, depending on their level of expertise, teaching areas and professional learning focus. This program takes advantage of the collegiality in the Lanyon Cluster, reinforcing collaboration, interdependence and the sharing of responsibility for one another's progress (Ainscow & West, 2006, p. 135).

Building capacity through action learning

We began our focus on using action research to develop reflective practice through our ARC project involving 15 teachers in 2005. In 2009, 47 teachers in the Lanyon Cluster of Schools presented their *Learning by Design* Learning Modules and action research at local, national and international forums on values education, studies of Asia, financial literacy, Indigenous education, history, English and literacy (see Learning Modules in References). By 2014, 100 teachers presented action research that was linked to their personalised professional learning focus.

Action learning involves participants examining their own educational practice systematically and carefully, using the techniques of research and aligning with the Cluster vision of using evidence to inform practice. Its power comes from teachers' agency in identifying, examining, and assessing issues for themselves, and then collaboratively addressing these issues and considering ways of working differently (Watts, 1985; Aubusson et al., 2009). Each year teachers are asked to focus on one area to improve and document through action learning. Meeting three times a year, teachers work in Cluster groups to reflect collaboratively on data such as students' perceptions, understandings, values and knowledge, systematically gathered through questionnaires, analysis of work samples, interviews and observations. Transparency is ensured through the *Learning by Design* documentation and classroom observations. They also learn from each other; even the year 10 English teacher can learn a lot about literacy from the kindergarten teacher.

Building capacity through coaching and observations

Supporting early-career teachers has been the focus of our coaching in classrooms. Our coaches work with teachers to set a focus and goals. Coaches model strategies in classrooms, observe and give feedback to teachers, contribute to student case meetings, and collaboratively design *Learning by Design* Modules. Teachers can also request to observe other teachers in the Cluster to focus on a particular aspect of teaching and learning.

“First Steps” maps of development and data from “Mental Computation,” “Count Me in Too” and the “Big Ideas in Number” framework are also used extensively at student case management meetings, team meetings and Cluster meetings. Data walls make the data visible and inform discussions and decisions on future actions (Figure 4.4).

Building capacity through university partnerships

Learning by Design is one example of a university practice-theory partnership, firstly with academics at Royal Melbourne Institute of Technology University, and then with the University of Illinois. This provided an opportunity for nine teachers to complete a Masters of Education, *New Learning and New Literacies*, at the University of Illinois. With a strong focus on collaboration, teachers were among the first internationally to design Learning Modules with the newly developed *Learning by Design* digital design tools, building their capacity to lead others in *Learning by Design*. Partnerships with the University of Canberra (values education and giving) and the University of Melbourne (Becoming Asia Literate) also provided opportunities for building the capacity of teachers to design curriculum using *Learning by Design*, thereby increasing the collective pedagogical knowledge, as well as developing their reflective practice through action learning.

The focus on professional learning has been an important factor in establishing strong Cluster connections. The defining characteristics of effective

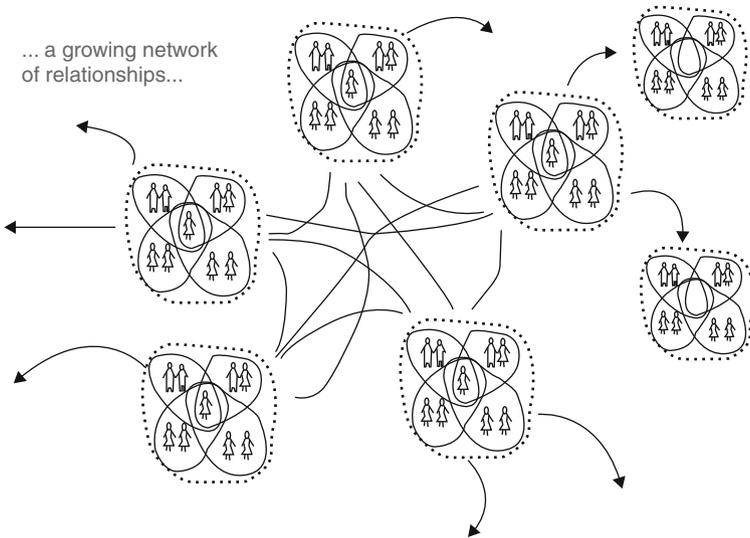


Figure 4.5 The focus on building capacity ensures all teachers have opportunities to become leaders and build networks

networks according to Veugelers and O’Hair (2005, pp. 5–7), include teachers becoming members of a broad yet personalised and caring community; shared ownership and democratic leadership; accelerating and sustaining change; reflective practitioner/action research; and university-school partnerships, all of which the Cluster has addressed as it built the capacity of its teachers and leaders (Figure 4.5).

Innovating collaboratively

The commitment of Lanyon Cluster schools to *Learning by Design* has been a highly significant factor in enabling innovation to occur in instructional practice while maintaining coherence in pedagogy, curriculum and teacher professional learning. This has been demonstrated in a number of major innovative projects, often funded by external grants and supported by strategic partnerships.

In the “Giving” project we partnered with local environmental, business and government organisations, and an academic adviser from the University of Canberra, Thomas Nielsen. All learning was designed with *Learning by Design* (see Learning Modules in References), and thus systematically prioritised teaching, learning, collaboration and transparency.

Students from preschool to year 10 applied their learning through “Giving” projects such as working with environmental groups to plant trees and improve animal habitats, fundraising projects for charities, walking to school to save energy, and letters of support to soldiers in Afghanistan. Students also gave back to younger students by running basketball and football clinics, fun days, reading, creating animated versions of children’s stories, building a bridge at the preschool, and sharing culture through a “Henna Store” in which two students from Indian backgrounds painted students’ hands with henna. There were over 100 visits by students to the local ponds and nature park to learn about water quality and pollution, and visits by 400 students to the local water treatment plants.

Three “Giving” assemblies were held involving 1,000 students from kindergarten to year 10 to share projects with whole school communities and to celebrate their achievements. The combined Cluster assemblies have become a regular feature of student Cluster collaboration to celebrate learning, promote Cluster cohesion and support the transition of students from primary to high school (Figure 4.6).

The “Giving” project is an example of how the Lanyon Cluster schools collaborated intensively and purposefully to find innovative ways of improving student learning, using *Learning by Design* to create rich learning sequences while at the same time increasing teacher capacity. Projects like these can easily focus on experiential learning, but by using *Learning by Design*, all of the four knowledge processes (experiencing, conceptualising, analysing and applying) were embedded in the learning of students. In particular, students



Figure 4.6 Students took action by cleaning up the local ponds and “giving” to the environment

gained deep knowledge and understanding of the importance of scientific concepts and environmental issues through conceptual and analytic learning. *Learning by Design* ensured that pedagogy remained rich and strong, and by ensuring the knowledge processes were foregrounded, that learning was truly transformational.

Learner transformation

Learner transformation is identified as one of the main conditions of learning by Kalantzis and Cope (2004, 2005). They argue that curriculum and pedagogy must address diversity through the transformation rather than the assimilation or integration of the learner. Learner transformation requires taking students from their lifeworld experiences to deep knowledge, understandings and perspectives with:

“... the kinds of capacities for knowing that children need to develop in order to be good workers in a “knowledge economy,” participating citizens in a globalised, cosmopolitan society, and balanced personalities in a society that affords a range of choices that, at times, seems overwhelming.”

(Kalantzis & Cope, 2012b, pp. 75–76)

Transformation involves the purposeful deployment by teachers of appropriate pedagogies and meaning-making modalities which are inclusive of the diverse needs and ways of knowing of children. Mills (2006) found that when teachers used direct transmission and rote learning, students were unable to use their own meaning-making resources and hence there was less

likelihood of learner transformation. Through *Learning by Design* teachers could make the appropriate pedagogical moves that would ensure learner transformation.

Capturing the richness of learner transformation such as multimodal meaning-making of complex texts and attitudinal change cannot be captured by one-dimensional universal standardised testing. While we used standardised testing to evaluate our progress, we also focused on using a range of data from authentic classroom assessments that could capture both qualitative and quantitative evidence of learner transformation. An example of this was a “Becoming Asia Literate” project in 2010 where the learner transformation was evident in both attitudinal change and literacy learning. In this project teachers developed, documented and implemented eight Learning Modules using *Learning by Design* to embed studies of Asia in art, woodwork, food technology, English/literacy, history, geography and Japanese (see Learning Modules in References). Teachers used “experiential” learning to value students’ prior knowledge and engage them through texts, experiences and activities related to Asia. They included “conceptual” learning to develop deep knowledge of Asian history, geography, society and culture, and “analytical” learning to develop deep understanding by challenging stereotypes, examining a range of perspectives, and developing informed attitudes and values of tolerance, inclusion and respect based on an appreciation of the diversity of Asia’s peoples.

The evidence of learner transformation was captured by 15 teacher scholars plus 16 other teachers who also taught the “Becoming Asia Literate” Learning Modules to a total of 810 students in 35 classes. It included an in-depth analysis of the work of 28 focus students. For example, a teacher of years 5/6 reported that “Qualitative data on three focus students was closely analysed, and all students demonstrated increased and heightened empathy in their responses towards the images from Hiroshima.” Another example was a year 9 history student studying the Vietnam War. He began the project by annotating some of the iconic images of the “Napalm Girl” and the “Burning Monk” with very inappropriate one word responses. At the end of the Learning Module, he was asked to again comment on the images. This time he demonstrated understanding and empathy, stating that he felt “amazed at the inhumanity that went on in war.” In response to the image of the “Burning Monk,” he commented that he admired the monk for his dedication to his cause and lamented that such a drastic form of protest had to happen at all. The changes in attitudes to studying Japanese culture and history were captured in the action research at Gordon Primary School. Year 5 and 6 students had been studying Japanese language from kindergarten with 21% of students feeling bored and 28% feeling great. There was a significant shift in engagement by the end of the project with only 11% feeling bored and 51% feeling great (Figure 4.7).



Figure 4.7 Attitude change to learning about Japan

Learner transformation also occurred in literacy. The project in the Kindergarten-year 2 project had a strong literacy focus, particularly on writing information reports. Hence, a kindergarten boy began the project just being able to write his name, was only engaged in play and had not yet seen the purpose of writing. By the end of the project “he was articulating his knowledge with relevant conversation, was focused and determined to write daily. From immersion in the unit, he has taken ownership of his learning; an asset which has been sustained into the next term.”

Thirty-six students in the kindergarten-year 2 classes were mapped on the First Steps Writing Map of Development. Seven students or 19% moved through 2 phases, 20 students or 56% moved through 1 phase, while 9 students or 25% remained in the same phase, but demonstrated many more indicators in the phase they were in, as well as some indicators in the next phase. In the First Steps Maps of Development, validated by the Australian Council for Educational Research, students typically stay in a phase for 12–18 months. However, as this project was conducted over four months, 27 students or 75% exceeded expectations in their growth in writing.

Learner transformation was also evident in the increase in knowledge and understanding. In a year 7 woodwork class creating Chinese puppets, a focus student’s knowledge about China shifted from being able to list generic facts about China to confidently discussing the beauty and richness of art forms. Her attitude toward puppetry shifted from centring on the physical attributes of construction to it being a culturally significant art form, used not only to entertain but to pass on tradition. For year 5/6 students, the students’ knowledge about Japan increased significantly. As students had been studying Japanese language for five or six years, all felt they knew something about Japan at the beginning of the project. However, by the end of the project, 58 students or 41% felt they knew a lot, compared to 21 students or 15% (Figure 4.8).

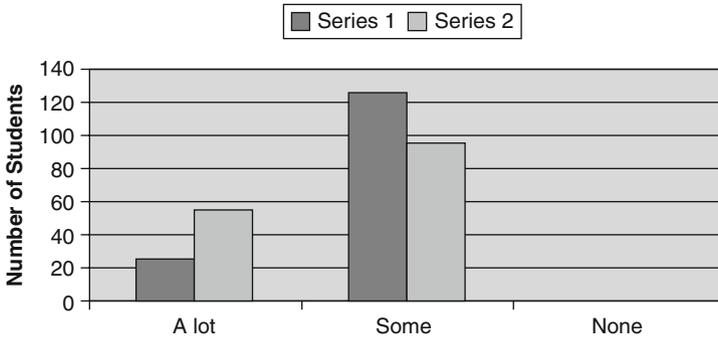


Figure 4.8 Knowledge about Japan

As always in our Cluster work, the project achieved much more than improved learning outcomes for students as there was also teacher transformation. Teachers developed their understanding and knowledge of Asia, quality pedagogy, conducting action research, using information communication technologies, writing and presenting. They showed that they were lifewide and lifelong learners and were excellent role models for their students. Four teachers commented on how studies of Asia increased the intellectual quality of their practical subjects. One commented, “I realised the importance of using practical subjects, which often engage underperforming students, to develop cultural understandings and other important life skills, including literacy and numeracy.” Another teacher commented, “I learnt that it is important to teach using strategies which value diversity in the classroom and acknowledge students’ learning needs, and that giving students’ autonomy in their learning is a powerful tool.”

National Assessment Program in Literacy and Numeracy (NAPLAN)

The impact of the work of the Cluster is also measured by literacy and numeracy performance in national standardised tests, the *National Assessment Program in Literacy and Numeracy (NAPLAN)*. In 2003–2004 the Cluster Executive team developed literacy and numeracy goals that the results for Cluster schools be not significantly different from the results of the Australian Capital Territory (ACT) as a whole. This was a courageous goal, as the ACT is generally the highest performing jurisdiction in Australia and with 30–50% of students in the Cluster identified as low socio-economic status; the mean scores for Cluster schools were generally significantly lower than the average in the ACT jurisdiction.

While the Cluster performance in national tests has varied, improvement trends are evident. This is demonstrated in the following graphs based on data between 2010 and 2014 (Figure 4.9).

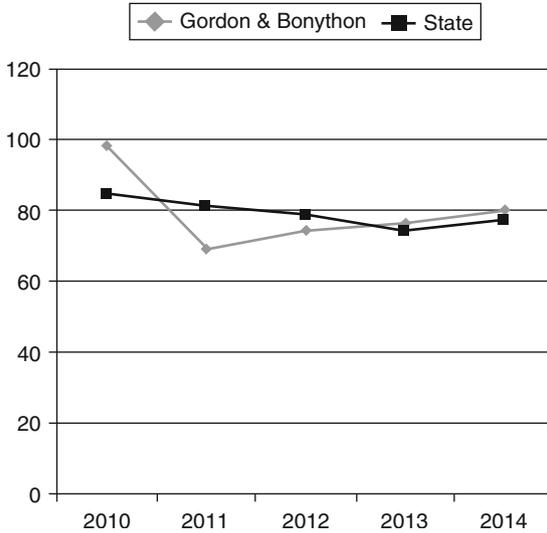


Figure 4.9 NAPLAN reading scaled score growth between year 3 and year 5: mean of Gordon and Bonython scores compared with state mean

This graph shows the mean scaled score growth achieved by five cohorts of students as they progressed from year 3 (4th year of primary school) to year 5 (6th year of primary school) between 2010 and 2014. The blue line shows the mean growth scores achieved by Bonython and Gordon Primary school students (the two Cluster schools that collaborated intensively throughout the five-year period). The red line shows the mean growth achieved by all students in the ACT jurisdiction.

The combined population of Gordon and Bonython students achieved mean growth higher than the state mean in three of the five years. After a marked dip in 2011 the trend for the combined population of Gordon and Bonython students over the three years from 2012 to 2014 is upward (Figure 4.10).

This graph shows the mean scaled score growth achieved by three cohorts of students as they progressed from year 3 (4th year of primary school) to year 5 (6th year of primary school) between 2010 and 2014. No data is provided for the cohorts reaching grade 5 in either 2011 or 2012 because the testing authority changed the writing test genre from narrative to persuasive writing. The 2013 year 5 cohort was the first that completed NAPLAN persuasive writing tests in Grade 3.

The combined population of Gordon and Bonython students achieved mean growth higher than the state mean in two of the three years. After a marked dip from 2010 to 2013 the combined Gordon and Bonython mean

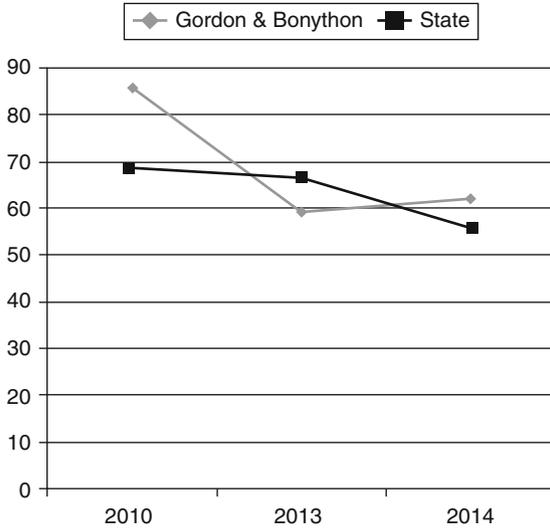


Figure 4.10 NAPLAN writing scaled score growth between year 3 and 5: mean of Gordon and Bonython scores compared with state mean

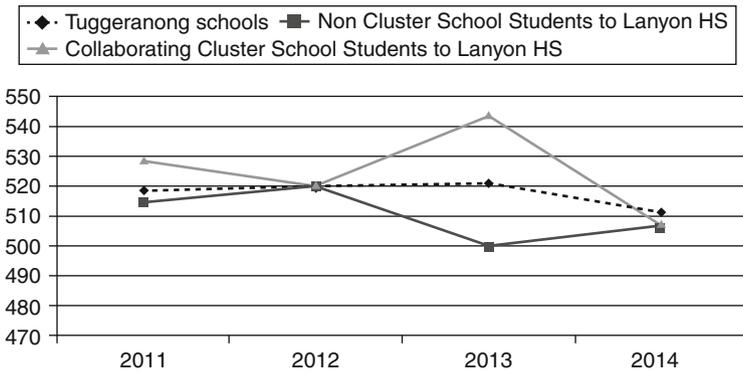


Figure 4.11 Year 7 reading data 2011–2014

growth scores, according to this chart, are beginning an upward trend in contrast to the state mean growth score which is beginning a downward trend.

Figures 4.11 and 4.12 show mean scores for different groups of students in year 7 at Lanyon High School in Reading and Writing from 2011–2014. These graphs demonstrate the effects of the Cluster’s collaborative approach.

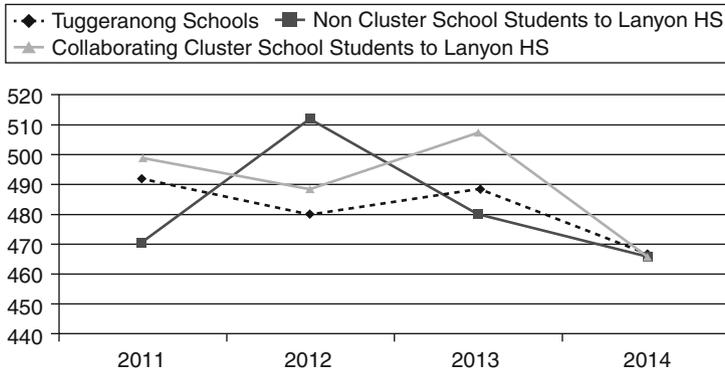


Figure 4.12 Year 7 writing data 2011–2014

Lanyon High School year 7 students from the collaborating schools generally achieved higher mean scores than other Lanyon High year 7 students from non-collaborating schools and students from other Tuggeranong district primary schools.

Embedding initiatives

Teachers and schools are forever going through cycles of change. Schools must respond to issues in their communities, and to local and national initiatives, including calls for improvement in national literacy and numeracy testing. *Learning by Design* enabled the Cluster to respond to a range of initiatives that emerged from our local Tuggeranong district network, the Australian Capital Territory (ACT) jurisdiction and the Australian Government, as well as those initiated by us. These have included implementing a state-based and then a national curriculum, information technology, values education, driver-safety education, studies of Asia, Indigenous education, the Quality Teaching framework, and the Australian Institute for Teaching and School Leadership standards for teachers to evaluate their own performance and professional growth as teachers, and gain accreditation through the ACT Teacher Quality Institute. Interpreting each new initiative through the *Learning by Design* framework ensured that it would be delivered through the curriculum with immediate connections made to teaching and learning and to students in classrooms.

Other initiatives our teachers have grappled with have been promoted by our district network, the Tuggeranong Network of Schools. This network was established in 2009 to enable 20 district schools to work collaboratively on improving student outcomes. The Network priorities: knowing our students well; personalising learning; pathways for students and working

collaboratively aligned with our existing Cluster priorities. In particular, the priority of personalised learning provided an opportunity to build on the work we had already been doing to address diversity through the pedagogy of *Learning by Design*. The work on personalised learning has had success in engaging students at a higher level and motivating them as passionate, collaborative learners. Students use personalised learning goals, including learning intentions and success criteria so they have agency in regard to formative assessment of their work. They are using capacity matrices to assess their areas of need to guide themselves through the *Learning by Design* knowledge processes as they reach mastery. We continue to develop these pathways of personalised learning from primary schools into the high school. Our work in these priorities is recognised at the district level as we continue to enhance our collaborative relationships with other network schools.

The focus on multimodality in *Learning by Design* has also been important to integrate technology into the classroom. Michael Fullan (2011a) argues that technological tools must be supported by pedagogy. So as we integrate “Bring Your Own Device” approaches in our schools and explore the range of technologies now available, we use *Learning by Design* to ensure that technology is embedded in learning. For example, the *Learning by Design* knowledge processes of “Conceptualising” and “Analysing” ensure that students collaborate, evaluate, synthesise, think creatively and critique information. Through “Analysing Functionally” and “Analysing Critically” they learn about visual, gestural, spatial and linguistic modes of communication, and how these modes can be used to position audiences to think in a particular way. These link to the 21st century Fluencies (Crockett et al., 2011) that focus on preparing students to be citizens of the future where they are active knowledge makers, not just passive consumers of knowledge. We are also now using “Scholar,” a digital writing environment to build communities of learners within and across the Cluster schools. “Scholar” supports personalised learning and collaboration. It is also our new tool to document our *Learning by Design* modules and to deliver curriculum to students using technology.

In taking on board all of these initiatives, we have realised that the pedagogical underpinnings of *Learning by Design*, and its collaborative approach, continue to set us up well to develop future-focused initiatives.

Connected and focused

As is often the case with implementing initiatives across an organisation, engaging everyone in the journey can be challenging. As we approached all of these hurdles, we needed persistence and a belief in the power of a strong learning community. With our commitment to *Learning by Design*, we had a shared focus and language that gave us a sense of being a part of something

bigger. Further, we were able to call on our collective team when confronted by challenges.

In the section that follows, our teachers and teacher leaders share their stories about their experiences and connections to the Cluster work, particularly in relation to *Learning by Design*.

Peter's story

As a leader (I have had roles as a principal and deputy principal in the Lanyon Cluster), you know that in every educational journey there are people who get on board straight away, while others need a little more time to see how it works in practice. The cause of engaging teachers was serendipitously addressed by a teaching tool that I created and has now become known as *Peter's Placemat*. The placemat includes all the knowledge processes of the *Learning by Design* framework, in four quadrants on the one page (Figure 4.13).

After I presented it at a staff meeting, teachers seeming to go away with a better picture of how the knowledge processes worked and linked together. I was, however, in for a surprise. One staff member, who had not been engaging on the journey, proudly presented a completed placemat at the next Cluster sharing session. This staff member went on to become a leading member of a team, planning, designing, delivering and reflecting on a particularly successful Learning Module.

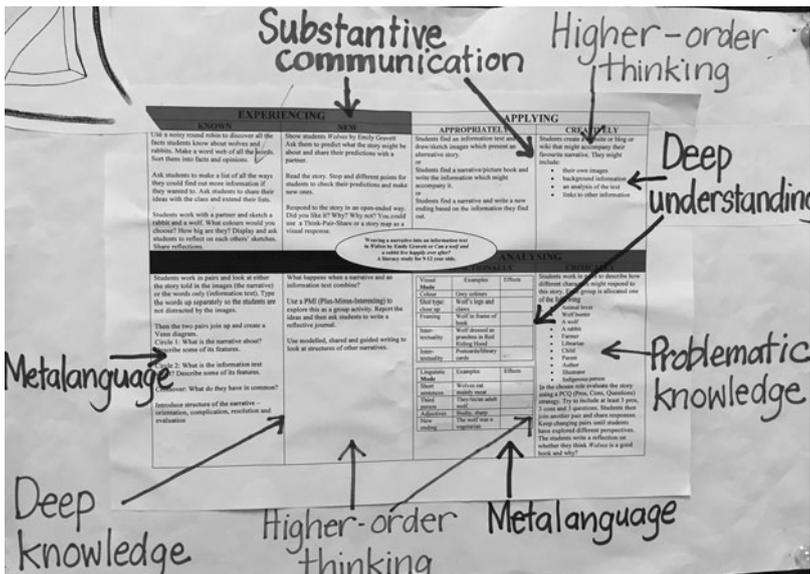


Figure 4.13 Example of a *Learning by Design* planning placemat analysed through the quality teaching lens

Peter's Placemat has since gone through modifications that unpack the knowledge processes and list teaching strategies for each knowledge process. It has also been adapted for both literacy and numeracy. It has become an important planning template across the Cluster and is now used by schools implementing *Learning by Design* across the world. I remember attending a conference in Melbourne and sitting in the back of a workshop where teachers were sharing their work on *Learning by Design*. The planning template they were using was Peter's Placemat! I had unwittingly, in the beginning, created a tool that enabled teachers in the Cluster, and further afield, to connect meaningfully with the work, and focus on building the knowledge processes into their planning.

Prue's story

As a beginning teacher in the Cluster, walking into the classroom with a *Learning by Design* Learning Module was a life-saver. I felt supported to create a classroom community that engaged in quality curriculum and pedagogy. It also gave me a language to talk to other teachers about learning. After I finished teaching my first Learning Module I remember planning with the year 10 English team the writing of our next Learning Module. From here it grew. That year we documented every module using *Learning by Design*. In my second year, we taught them and edited them all again. This process was so important; it allowed consolidation and improvement. It's amazing to look back now at the work we've done which is documented and now published professionally in the *Scholar* bookstore. Nine years later, I am still in the Cluster, working with teachers in all curriculum areas in my role as a coach and mentor, a job that is made easy by the fact that a culture focused on learning already exists in the Cluster.

As a beginning teacher I naïvely believed that teaching in a Cluster like ours was the norm; I've found that this is not true. The Cluster gave me access to innovative teaching ideas, and to teachers who were actually enacting them, not just talking about them. The Cluster also encourages teachers to experiment and innovate in the classroom, but to do so knowing that they are being supported. An example of this is that in 2012, I was lucky enough to be one of the first teachers to use *Scholar*, an innovative digital writing platform that creates online communities of students and encompasses the power of peer feedback. Trialing it in the beginning and seeing what it is like now, I am glad to have been a part of the journey, as are my students who are now experts in its use. Overall, the Cluster and its focus on pedagogy through *Learning by Design* energises my teaching, and I continue to learn and grow professionally.

Robyn's story

I was introduced to *Learning by Design* while working in another Canberra school. When I saw a teaching position at Bonython Primary School, one

of the Cluster schools, I was excited to apply, knowing that I could extend my knowledge and understanding of *Learning by Design*. Once appointed, I worked collaboratively with my team to design Learning Modules and weekly plans on placemats in literacy. Through these experiences I developed my leadership skills and later won a position as an executive teacher of the preschool to year 2 team. In this role I took *Learning by Design* into our numeracy planning.

In 2010, we introduced weekly numeracy plans to ensure all learning was planned and targeted to the needs of students. We used the system numeracy planning framework that included warm ups to energise students, explicit teaching (modelling and demonstrating) of new concepts, whole class/small group practice, and reflection. This resulted in a whole school approach, with a particular focus on explicit teaching and targeted learning for all students. However, there was something missing, deep intellectual quality: cumulative learning; inclusivity; and transferring newly acquired mathematical skills to real-life settings so students understood the purpose of their learning.

How could we achieve this? It seemed ironic that we successfully scaffolded and achieved deep learning and intellectual quality for students in our design and planning of literacy and integrated units through *Learning by Design*, so why weren't we using it for mathematics? Thus began our journey of integrating *Learning by Design* in our numeracy planning. Our first placemat was on measurement and time, and I facilitated discussion of learning experiences through the knowledge processes, documenting ideas on the placemat, and discussing questions such as: How will you find out what they know? What literacy texts or interactive sites could we use to introduce, model or demonstrate the concept? What needs to be defined or explicitly taught? What language or grammar needs to be explicitly taught or unpacked? Why is it important to be able to tell the time? How will students show their learning and understanding of time? What impact will this new approach to teaching maths have on students, teachers and parents?

The Cluster connections reinforced this work as at a Cluster planning day, our K-2 teachers led and supported their Cluster colleagues in the collaborative planning of *Learning by Design* placemats. They felt acknowledged and valued for their work. I personally feel that this was the pinnacle, the point at which teachers were motivated to plan mathematics using the *Learning by Design* framework. What was originally a plan to design two placemats for the year, ended up resulting in approximately 20 across the K-2 learning team! All I can say is, "WOW!!!! What an achievement! What a journey!"

Sue's story

I have been a member of the Lanyon Cluster of schools since its inception in 1993 and have worked with all Cluster schools in a variety of roles including classroom teacher, literacy coordinator, learning assistance teacher, Quality

Teaching coordinator, and most recently in a coaching role as a literacy and numeracy coach. A balance of certainty and stability on the one hand, with challenge and stimulation on the other, keeps me motivated and absorbed in the work of the Cluster.

The sustained Cluster purpose and commitment to the continual improvement of what's important drives my commitment to the work that we do. Michael Fullan (2011b) describes this as the moral imperative, which "focuses on raising the bar and closing the gap in student learning for all children regardless of background."

Teachers cannot keep delivering more of the same experiences that I had as a student - decades ago now! While supporting teachers to move from this default mode of teaching is challenging, theories of learning and arguments for a new kind of learning for the 21st century articulated by Kalantzis and Cope (2012b) provide me with the motivation, knowledge and understanding to strive for change.

The school and Cluster environment is supportive, vigorous, collaborative and professionally enriching. Productive connections with Cluster colleagues have developed over time through diverse structured cluster-based activities centred on shared purpose and vision. These include sharing action research, leading professional learning, collaborative planning sessions, classroom visits, sharing resources, and structured professional reflection and discussion. I relish working with energetic and open-minded, mostly early-career teachers that populate our Cluster schools. They fill my school with a love of teaching, a love of learning and a desire to make a difference to their students.

Involvement in professional learning at all levels in the Cluster is stimulating and intellectually rewarding. This has involved designing and leading professional learning as well as participating in readings, discussion, reflection, analysis and research. I am fortunate to have been challenged and mentored by the cluster deputy and the principals from each of the schools, and this is a significant factor in my engagement and commitment to the work we do.

My current position as a literacy and numeracy coach is rich, varied and stimulating, and I feel valued by my school and cluster executive, classroom teachers and students. Working in a school that has a clear purpose and direction supports, guides and enables my role. Who wouldn't love this job?

The journey continues

The network of the Cluster schools is connected by a common philosophy, language and purpose which is a hallmark of long-lasting networks (Thomson, 2007). Rather than simply knowledge sharing, there is a willingness to address challenging issues such as improving student learning outcomes through quality teaching, addressing issues of diversity and equity,

building the capacity of teachers and leaders, and engaging and challenging students, not just for the economic purpose of preparing them for the labour market, but for citizenship in a democratic society in which they can “navigate change, discern meanings, negotiate deep diversity, and create and innovate” (Kalantzis & Cope, 2012b, p. 75). This is a large and ongoing agenda.

As the Lanyon Cluster learning journey continues, there will be many more challenges. We know that change will be a constant as we build the capacity of new teachers and new teacher leaders, as we support, engage, challenge and transform the next group of students, as we adapt and embed new technologies, and as we integrate new initiatives. *Learning by Design* will continue to keep us focused and connected, and enable us to keep learning at the centre of our learning community.

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5

Integrating by Design: Multimodality, 21st Century Skills and Subject Area Knowledge

Anne Cloonan

A renewed focus on pedagogy is a pressing need as too often the incorporation of digital tools and multimodal texts into classroom programs is through traditional pedagogies. Limited pedagogical choices can fail to engage students actively in ways that foreground agency and enhance learning through maximising the affordances of the digital tools and texts. This chapter explores the use of Learning by Design as a means of integrating both multimodality and 21st century skills into subject area curriculum offerings. Foregrounding the rise of multimodality and 21st century skills and the challenges they pose for pedagogy, the chapter considers approaches to curriculum integration and positions Learning by Design as a pedagogically driven means of curriculum integration. Drawing on a case study, it then discusses one teacher's renewed design and implementation of a unit of work in which multimodality and '21st century skills' were integrated into literacy and subject area learning through Learning by Design.

Introduction: the rise of multimodality and 21st century skills

The development and avid adoption across communities of a burgeoning array of digital media is impacting on learning, socialising, citizen identities and participation (Ito et al., 2008; 2009). In schools, student access to and interpretation, creation and sharing of knowledge in multimodal forms continues to challenge teachers across subject areas (Macken-Horarik, 2009; Jewitt, 2014). Increased student agency enabled by the introduction of digital technologies into school classrooms is also challenging print-centric pedagogical practices and teacher-centric models of knowledge distribution and responsibility (Cloonan et al., 2014).

In response to assessments of what is worth knowing at this point in history, educational policy and school systems in Australia and elsewhere, are redefining 'which qualities count as the embodied characteristics of a "good student" ' (McLeod & Yates, 2006; p. 51). In Australia, a national curriculum is for the first time being incrementally developed and introduced (ACARA, 2012). At the time of writing, the subjects or 'learning areas' of English, Mathematics, Science, History and Geography are ready

for implementation. Still under development are the learning areas of the Arts, Health and Physical Education, Civics and Citizenship, Economics and Business, Languages, Technologies and Work Studies.

In recognition of the impact of digital technologies on meaning-making, the teaching of multimodal texts is now embedded throughout the learning area of English at all levels of compulsory schooling (ACARA, 2012) and in the state of Victoria, also in post-compulsory learning (VCAA, 2014). This is a result of widespread and prolific research into the integration of digital technologies in the area of literacy education (e.g. Snyder, 1997; 2007; New London Group, 2000; Kress, 2003; Hull & Nelson, 2005; Unsworth 2006; Beavis, 2007; Coiro et al., 2007; Baker, 2010; Walsh 2010) with technology rich learning environments shown to broaden options for interactivity, multimodal meaning-making and collaboration.

Related influences include the rising prominence of 'soft skills' (Murnane & Levy, 1996; Levy & Murnane, 2005) or '21st century skills' (Trilling & Fadel, 2009) as digital technologies enable new kinds of human capital and challenge knowledge and its traditional bases (Luke et al., 2007). Their necessity has been acknowledged in educational policy which recognises skills essential for 21st century learning including literacy, numeracy, information and communication technology (ICT), thinking, creativity, teamwork and communication (MCEETYA, 2008). These too have found prominence in the new Australian Curriculum (ACARA, 2012) in the form of seven 'general capabilities' including literacy (including visual literacies and multimodal texts), numeracy, critical and creative thinking, personal and social capability, ethical understanding and intercultural understanding.

While a significant amount of literacy teaching occurs within the learning area of English, there are also opportunities for teaching literacy in all curriculum areas. The Australian Curriculum requires all teachers to take responsibility for teaching the subject-specific literacy of learning areas; to develop a clear understanding of the literacy demands and opportunities of the learning areas; and to embed appropriate literacy content and processes in the learning areas they teach. These expectations are of all teachers of students in compulsory schooling. For generalist primary school teachers (teachers of students aged five to twelve in Australia) this means understanding the subject-specific literacies of all learning areas. Subject-specific literacies, including subject English, are in large part made up of multimodal literacies.

The increased centrality of multimodality in the curriculum is due in large part to the transformative impact of digitisation on the very nature of texts and its influence in redistributing the creation and sharing of representational modes from technical specialists to contemporary students' in their homes and, where allowed, their classrooms. Examples of such multimodal transformations include the integrated use of written and oral language with icons and still and moving images (examples of the visual mode of meaning); music and sound effects (from the audio mode); facial expressions and hand and arm movements (from the gestural mode); and the

potential evident in films with aroma capacities and games and books requiring touch interaction (examples of the tactile mode) (Kalantzis et al., 2010).

Development of general capabilities (a policy interpretation of 21st century skills), including multimodal literacies, can be supported through the teaching of traditional school subjects such as 'English', 'Economics' or 'Science'; however, their teaching is not exclusively bound to individual subject areas. General capabilities are taught *within* and *across* school subjects. The heightened focus on capabilities that are not restricted to particular school subjects is putting pressure on contemporary curriculum development and implementation as curriculum imperatives and school systems respond to changing conditions (Cloonan, 2014).

In Australia, while curriculum content is mandated, individual schools have flexibility in deciding how the content of subjects is presented to students, including what pedagogical approach is taken. Pedagogy is one of the three message systems which constitute curriculum studies, along with curriculum and assessment (Bernstein, 1971). However, of the three, pedagogy is the one that is not usually mandated (Rizvi & Lingard, 2010). This is being subtly challenged by the positioning of multimodal literacies and general capabilities both within and across school subjects; a positioning that suggests the use of integrative pedagogies, without providing a detailed rationale for, or specific advice on, their implementation.

Calls for a renewed focus on pedagogies are emanating from research into the teachers' incorporation of digital technologies into curriculum areas, as all too often findings continue to reveal 'old [pedagogical] wine in new bottles' (Lankshear & Bigum 1999; p. 456). Teachers may be incorporating new digital tools into classroom programs, but using them in ways that replicate traditional pedagogies. This results in a failure to enhance student learning through maximising the affordances of the new tools (Miller & Olson, 1994; Snyder, 2007) and to engage students actively in ways that foreground student agency (Cloonan et al., 2014).

This chapter explores the use of *Learning by Design* as a means of integrating both multimodality and '21st century skills' – in this case in the form of general capabilities – into curriculum offerings. Foregrounding the issue of pedagogy, the chapter considers approaches to curriculum integration, and positions *Learning by Design* as a pedagogically-driven means of curriculum integration. Drawing on a case study, it then discusses one teacher's renewed design and implementation of a unit of work in which multimodality and '21st century skills' were integrated into literacy and subject area learning through *Learning by Design*.

Approaches to curriculum integration

Commended by Dewey in the 1930s (Dewey, 2007) and supported by Bruner in the 1960s (Bruner, 1986), approaches to curriculum integration have waxed and waned in popularity over a long period of time (Rennie &

Wallace, 2009). Integrated approaches to subject area learning are often presented as an antidote to student disengagement (Godinho, 2007). While subject area learning can divide and fragment knowledge, resulting in a lack of relevance to students, learning focused on issues that draw on a range of subject areas can engage students in ways that more closely reflect out-of-school or real-world capabilities (Jacobs, 1989a).

More recently, in the face of shifting demographics and cultures, impacts of globalising and technologising forces on the growth of and challenges to knowledge and its traditional bases (Luke et al., 2007), integrated approaches are positioned as curriculum responses to calls for new kinds of human capital. However, curriculum integration is not a single, definable, agreed-upon concept. It has multiple labels and definitions that are sometimes used interchangeably.

Hayes Jacobs (1989b) presents a continuum of six alternative approaches to curriculum integration defined by the relationships between school subjects and organisational arrangements: discipline-based, parallel disciplinary, multidisciplinary, interdisciplinary, integrated day programs and complete integrated programs. These can be briefly described as follows. Discipline-based teaching involves disciplines taught independently of one another and so there is no integration. In parallel disciplinary teaching, teaching related disciplines focus on aspects of the same topics or areas of interest as might occur, for example, in teaching a parallel topic in a history lesson and in a literature lesson using historical fiction. Multidisciplinary teaching involves linking of multiple school subjects by a theme or issue while maintaining the integrity of the disciplines rather than attempting to synthesise knowledge. Interdisciplinary approaches (presented by Jacobs as the most sophisticated) involve knowledge and ways of thinking from a number of disciplines brought together to explain issues and solve problems, such as how to address a problem of pollution or create a community garden. Integrated day programs address an issue or area of learning that is highlighted for a single day. A complete integrated program involves all curriculum design being implemented through an integrated approach (Jacobs, 1989b).

Other theorists present further options that subtly differ from those described above. For example, Wallace, Sheffield, Rennie and Venville (2007) identify five integrative teaching approaches: synchronized, cross-curricular, thematic, project-based, whole school specialisation and community focused curriculum design and implementation. Synchronised teaching refers to teaching of similar content and processes in different school subjects. Cross-curricular teaching comprises the incorporation of broad skills, concepts or attitudes across separately taught elements of the curriculum. Thematic teaching involves linking subjects into a similar theme or point of focus. Project-based teaching is the organisation of curriculum around a project/s within which subjects are embedded and subject boundaries blurred. A whole school specialised approach involves a long-term commitment to an area of specialisation; and community-focused programs are designed to help students understand and appreciate notions of community.

Making sense of this array of nuanced alternatives with varied nomenclature appears to be an obvious obstacle to knowledgeable curriculum integration. Inappropriate, interchangeable use of terminology describing various approaches to curriculum integration by teachers (Godinho, 2007) reflects the general lack of consensus in the area.

In describing other challenges facing educators seeking to integrate curriculum Loepf (1999) recommends that teachers need to change teaching approaches from didactic to constructivist; increase subject-based knowledge; become active members of learning communities; develop their small group learning facilitation skills; become skilled in managing experiential-oriented instruction; and use authentic assessment strategies.

Implicit in these recommendations is a conflation of a subject-based approach with didactic pedagogies and a similar conflation of integrated approaches with constructivist pedagogies. Beane (1997) describes systemic challenges to integration including school culture and infrastructure and views of the superiority of discipline-based knowledge, setting up a dichotomy between subject-specific and integrated approaches.

Advocating for carefully considered curriculum integration, Hayes Jacobs (1989b; p.10) cautions against discounting the importance of disciplinary-based work:

It's not a question of the disciplines versus interdisciplinary studies ... We do need in-depth, discipline-based work. But it needs to be modernised so that students can apply the range of those skills in viable and real interdisciplinary problems.

Subject area teachers draw on disciplinary knowledge, with many territorial about their specialisation within the curriculum. Such territorialism can be in protection of important disciplinary-based learnings that 'embody ways of thinking about the world' (Mansilla & Gardner, 2009; p. 101). 'Disciplining the mind' can be described as developing the capacity to move beyond memorising information and processes in subject area learning to a point where one can challenge ingrained ideas and apply knowledge and skills to new situations (Mansilla & Gardner, 2009; pp. 97–103).

The project reported on in this chapter sought a means of supporting teacher integration of both multimodality and '21st century skills' into subject area offerings. Rather than set up a dichotomy between subject-specific and integrated approaches, it sought for teachers to gain insight into their *pedagogical* preferences, to make interdisciplinary links where useful while ensuring that students developed important discipline-specific knowledge.

Learning by Design as a pedagogical means of curriculum integration

In contrast to cross-curriculum or integrated approaches that are defined by relationships between school subjects, cohesive issues or organisational

arrangements (Jacobs, 1989b; Wallace et al., , 2007), *Learning by Design* offers a *pedagogically-driven* framework for planning and implementing curriculum offerings (Kalantzis & Cope, 2004; 2005). Four knowledge processes are derived from *pedagogical* traditions and are an attempt to support teaching and learning within or across subjects. This is a key difference to the approaches discussed above.

Highly developed reflexivity is a suggested response to shifting social and learning conditions (Beck et al., 1994) and, to this end, pedagogy is positioned as knowing in action (Kalantzis et al., 2005). In the tradition of progressivism, value is placed on immersion in those authentic experiences which make the necessary connections with the learners (Gee, 1990), with experiencing the known recruiting learners' knowledge from their lifeworlds (Husserl, 1970), and experiencing the new immersing students in new information and experiences with instruction scaffolded so that new learning is within the students' zone of proximal development (Vygotsky, 1978).

The focus of conceptualising by naming involves defining and applying concepts both of the particular at hand and application in general (Luria, 1976; Vygotsky, 1978). Conceptualising by theorising involves the connection of concepts in discipline knowledge through generalising schemas or models (Kalantzis et al., 2005). In the tradition of critical pedagogies (Giroux, 1988), analysing functionally investigates cause and effect; it involves considering the use of any knowledge, action, object or represented meaning. Analysing critically interrogates human purposes and positions, querying the perspectives, interests and consequences of any piece of knowledge, action, object or representation (Kalantzis et al., 2005). Applying appropriately involves learner application of knowledge in a typical situation, be it in the human or natural worlds. In the tradition of applied or competency-based learning, this may involve a typical or accepted application, however it is never merely replicated but always transformative to some degree (Kress, 2000). Applying creatively involves learners in innovative applications or use of learning in a different situation, involving original and hybrid possibilities. Examples of student engagement in the learning by design knowledge processes are outlined in Table 5.1.

In this way each of the four knowledge processes reflects a distinctive pedagogical tradition which can be traced to theoretical bases that can be described in the context of its emergence. However, within the context of *Learning by Design*, each has been presented in terms of its affordances and limitations within a contemporary educational environment. When deployed in combination, and with an understanding of the limitations of each pedagogy, these can be offset by the strengths of another to support the design and enactment of classroom practices (Cazden, 2000; Kress, 2000; New London Group, 2000).

Learning by Design offers teachers a heuristic for auditing biases and gaps in current practices, as well as a model for curriculum planning which prompts

Table 5.1 Examples of student engagement in the *Learning by Design* knowledge processes

<i>Learning by Design</i> knowledge process	Examples of students engaged in knowledge processes
Experiencing	Students can experience <i>the known</i> (reflecting on their own experiences, interests, perspectives, forms of expression and ways of representing the world), and <i>the new</i> (observing or reading the unfamiliar, immersion in new situations, reading new texts or collecting new information)
Conceptualising	Students are actively involved in processing specialised, disciplinary knowledge based on the distinctive concepts and theories. This may be <i>conceptualising by naming</i> (giving abstract names to things and developing concepts) or <i>conceptualising by theorising</i> (building mental models, abstract frameworks and disciplinary schemas)
Analysing	Students use and develop critical capacity, be that through <i>analysing functionally</i> (drawing inferences, analysing textual connections) or <i>analysing critically</i> (evaluating their own and other people's perspectives, interests and motives)
Applying	Students apply their knowledge either <i>appropriately</i> (to real world situations, testing their validity) or <i>applying creatively</i> (innovatively transferring their previous knowledge into a new setting).

Source: Based on Kalantzis, Cope, & the Learning by Design Project Group (2005).

the use of the four knowledge processes. Offering a palette of pedagogies, *Learning by Design* directs focus to pedagogical differentiation for contextualised learning. Learning by design has been applied *within* numerous subject-specific teaching contexts such as English, Science and History, as well as for addressing issues which involve teaching *across* traditional subject areas such as studies of Asia and sustainability (Kalantzis et al., 2005).

The following discussion centres on an example of pedagogically driven curriculum integration enabled by *Learning by Design*.

Pedagogically-driven studies of multimodal texts and 21st century skills

This section of the chapter draws on research conducted in a Years 5 and 6 classroom (students aged 10–12 years of age). It presents an example of how one teacher, Steve (a pseudonym) was prompted to reflect on his pedagogical habits and preferences using *Learning by Design* as an analytical lens. Steve was one of three teachers in an outer suburban school in Melbourne,

Australia who agreed to be involved in participatory action research (Kemmis & McTaggart, 2005). In partnership with the teachers, opportunities for teaching related to curriculum integration were identified. Over a period of eight months, the teachers were invited to integrate teaching of multimodal texts and '21st century skills' in their classroom practice.

Research techniques included observation of classroom interactions and professional learning situations; focus group input; audio-visual data of classroom interactions; and collection of teacher- and student-produced literacy artefacts. Teachers also documented their reflections in a 'teacher impact journal'. They collaboratively and individually viewed data providing a stimulus for the teachers' reflective comment and analysis. Teachers were engaged as co-theorists within the methodological design; that is teachers worked *with* the researcher to design and adapt data collection tools and to analyse data.

Steve's Year 6 class had 28 students with an even breakdown of male and female students. Approximately 70% of the students were from a Vietnamese background, with the majority born in Australia, two students from a Croatian background, one of an Anglo-Celtic background and six students recently arrived from the Sudan. The school drew its population from a low socio-economic area on the outskirts of Melbourne.

Prior to his involvement in the research, Steve had been organising his literacy program as a skill-based set of daily literacy activities. Students would rotate through these activities that focused on aspects of reading, writing, spelling and grammar. When asked how he thought this approach was meeting the needs of students he explained:

Students are unengaged with much of the literacy work we do. In terms of literacy, all of my kids require work on their engagement. Also we need to look at improving their English vocabulary and working with different text types.

In order to make learning more engaging for his students and extend their literacy understandings and capacities, Steve decided to design an integrated unit of work focused on advertising which replicated the sorts of multimodal literacies required in the real world. The work in the advertising unit of work would involve students in processing knowledge from the curriculum areas of Economics, Mathematics, Arts and English. The literacy learning would cross these curriculum areas. Steve had a range of ideas regarding the literacy practices that he wanted students to develop and the types of texts that he wanted to engage students with. These are illustrated in Table 5.2: Tasks and texts for a unit of work on advertising.

From a literacy education perspective, the proposed practices involved extensive textual work including identifying, interpreting, analysing and creating a range of printed and multimodal texts. Interpretation and creation of these advertising-related texts would require student capacity in

Table 5.2 Tasks and texts for a unit of work on advertising

Literacy tasks	Texts
Internet research and collection of advertising company texts Creation of these advertising company texts	Logo Business card Mission statement
Internet research and collection of self-selected product/service	Product packaging and promotion-related texts
Internet research and collection of radio advertisements Creation of a radio advertisement for product	Radio advertisements
Internet research into persuasive texts to use with clients Creating a persuasive presentation including a PowerPoint show for the client	PowerPoint presentation incorporating logos, business mission statement, opinion survey and a radio advertisement

the traditional literacy areas of reading, writing, speaking and listening, as well as in the construction of multimodal texts in which multiple modes of meaning are combined, including written language, oral language, visual audio, tactile, gestural and spatial representations (Kalantzis et al., 2010). Multimodal texts involve the co-representation of these modes, for example a radio advertisement makes use of oral language and the audio mode through music and sound effects. A business card makes use of written language and the visual mode.

When asked about the pedagogies that he intended to draw on to engage students in their learning Steve was somewhat tentative in his response:

I'm not exactly sure how to answer that. I do want to engage the students in inquiry. So finding and analysing texts from the real world – texts that they find, not just texts from textbooks. I want the work to be integrated; to reflect the integration of subjects like Economics and literacy that we find outside of schools. To harness those real world pedagogies – but I want it to be more than a theme; to not lose the rigor of learning that each subject area offers. I am not really sure how to achieve the integration.

Steve was introduced to the *Learning by Design* pedagogy which he subsequently used to more deliberately and knowingly design a sequence of student learning. An overview of the sequence of learning which Steve designed for the advertising unit is shown in Table 5.3. It includes tasks, texts, modes of meaning and 21st century skills which he integrated into the sequence.

Table 5.3 Sequence of learning, tasks, texts, modes of meaning and 21st century skills advertising unit, organised according to *Learning by Design* pedagogy

Learning by Design knowledge processes	Literacy tasks	Texts	Modes of meaning/communication	21st century skills/General capabilities
Experiencing the known	Internet research and collection of advertising company texts	Economics/ Logo Business card	Written language/visual	Information and Communication Technology
Experiencing the new	Adopting the roles of market researchers and advertisers Internet research and collection of advertising company texts	Economics/ Mission statement Product packaging and promotion-related texts	Written language/oral language/visual/spatial	Information and Communication Technology, Personal and Social Capability
Conceptualising: by naming	Exploring features of advertising-related texts	Logo Business card Mission statement Product packaging and promotion-related texts	Written language/oral language/visual/spatial	Critical Thinking, Personal and Social Capability
Conceptualising: by theorising	Considering the differences between various texts and products	Logo Business card Mission statement Product packaging and promotion-related texts	Written language/oral language/visual/spatial	Numeracy Critical Thinking Personal and Social Capability
Analysing: functionally	Internet research and collection of research into self-selected product/service	Mission statements for various products and services	Written language/visual	Information and Communication Technology Critical and Creative Thinking

Analysing: critically	Internet and market research into target audience for product Creation of an online survey	Demographic descriptions Opinion surveys and survey results	Written language/visual	Numeracy Information and Communication Technology Critical and Creative Thinking Social Capability Ethical Understanding Critical and Creative Thinking Social Capability Ethical and Intercultural Understanding Information and Communication Technology Critical Thinking Social Capability Ethical Understanding Information and Communication Technology Social Capability
Applying: appropriately	Creation of advertising company texts	Logo Business card Mission statement	Written language/visual	Ethical Understanding Critical and Creative Thinking Social Capability Ethical and Intercultural Understanding Information and Communication Technology Critical Thinking Social Capability Ethical Understanding Information and Communication Technology Social Capability
Analysing: functionally	Internet research and environmental scanning of radio advertisements	Radio advertisements	Written language/oral language/audio	Information and Communication Technology Critical Thinking Social Capability Ethical Understanding Information and Communication Technology Social Capability
Experiencing the known/new	Internet and home-based research on radio advertisements Sharing of these with peers	Radio advertisements	Written language/oral language/audio	Information and Communication Technology Critical Thinking Social Capability Ethical Understanding Information and Communication Technology Social Capability
Conceptualising: by naming	Identifying elements of a radio advertisement	Radio advertisements	Written language/oral language/audio	Critical Thinking Social Capability
Analysing: functionally	Consider the function of aspects of radio advertisements	Radio advertisements	Written language/oral language/audio	Critical Thinking Social Capability

(continued)

Table 5.3 Continued

<i>Learning by Design</i> knowledge processes	Literacy tasks	Texts	Modes of meaning/ communication	21st century skills/General capabilities
Applying: appropriately	Creation of a radio advertisement for selected service or product	Radio advertisements	Written language/oral language/audio	Information and Communication Technology Critical and Creative Thinking Social Capability Ethical Understanding
Analysing: critically	Internet research into use of PowerPoint presentations to persuade potential clients	PowerPoint presentations	Written language/oral language/visual/audio	Information and Communication Technology Critical and Creative Thinking Social Capability
Applying: appropriately	Creating a persuasive presentation including a PowerPoint show for the client	PowerPoint presentation incorporating logos, business mission statement, opinion survey, and a radio advertisement	Written language/oral language/visual/audio	Information and Communication Technology Critical and Creative Thinking Social Capability Ethical Understanding
Applying: creatively	Presentation of persuasive presentation including showing PowerPoint slides	PowerPoint presentation including rehearsal of gestures	Written language/oral language/visual/audio	Information and Communication Technology Critical and Creative Thinking Social Capability

In introducing the unit, Steve took on the role of manager of an advertising company. He explained to the students that they were to assume the roles of employees in the advertising company that had been working hard to secure contracts with new clients. Steve explained that he wanted teams of employees to decide on a product that they would promote. Giving this choice to students gave opportunities for students to draw on their experiences, so catering for diversity. Working in teams allowed different students to take on different roles and combine their knowledge.

Once they had selected a product, students prepared a presentation including a PowerPoint show and a radio advertisement to persuade their employer (Steve) and associates (classmates) that their advertising campaign was worth presenting to a prospective client. The PowerPoint presentation would give key information about the company, including logo, mission statement and product, and audience-related market research. The radio advertisement would be the major selling point, showcasing their capacities. Each team had to work collaboratively through a series of inter-related tasks that positioned them as advertising employees. Steve would be supporting them through workshops exploring and analysing particular texts.

Over the course of a month, the students undertook the series of learning activities developing their background knowledge in both the advertising genre and products. Steve commenced each lesson with a focus on the structures and features of the texts students were studying. The learning tasks are in column two of Table 5.2.

The tasks immediately engaged the diverse range of students. The textual work involved students in vicarious experiences drawn from purposeful real-world practices. When reflecting on this new way of working and comparing it to the skills-based literacy rotations he had previously used, Steve noted:

The kids are really excited about it and I'm finding that there are fewer issues getting them motivated to work. With the literacy rotations I was always on their task for discipline and behavioural issues. Now trying to get them to stop work is more of a problem! It's not the superficial 'I have to learn this so I'll learn it' approach. The students are not under sufferance.

Clearly the students were engaged in their learning by the increased agency that the advertising project allowed. This was achieved in part by Steve's *situating* of his teaching practice through a project that incorporated texts from the 'real world', imitating the processes that people working in the advertising industry employ. This engaged students as they brought *experiences* from their own lives, the lives of their team-mates and texts they discovered through their research. Students collected examples of company logos, business cards and radio advertisements from their out-of-school lives. They brought these to school and shared them and, in teams, undertook Internet and newspaper research to find new examples. In this way,

they were exposed to known and new examples of texts. Steve also introduced them to unfamiliar text types such as business mission statements.

However, more than engagement and real-world experience is required for students to develop the literacy skills required of contemporary learners. Deeper knowledge of the structures and features of these texts is required. Steve initially found that this was an area that he often overlooked. As he remarked:

I came to see that I had an over-reliance on the pedagogies of experiencing and applying. I was failing to give my students opportunities to conceptualise and analyse texts. So I wasn't really giving them the tools to develop deep understandings of texts – I was like 'go and find some texts, read them and then create your own'. I see now that I was short-changing them.

Steve subsequently focused his teaching on the elements of each of the texts that students would be interpreting and creating (logos, business cards, business mission statement, opinion survey, radio advertisements, a presentation to clients including a PowerPoint show). He began lessons with modelled demonstrations of the findings of his own Internet research and environmental scanning, and discussed the linguistic structures and features and the various modes at work in these texts. This supported development of the students' *conceptual* understandings of the texts they were studying. For example, Steve played a number of selected radio advertisements to his students and then described the elements present, including music, sound effects and narration.

Steve built on the conceptual work by *analysing* the function and interests of the texts that students were discovering through their research. Purposes of and audiences for texts were discussed. The motivations and interests of the text creators of logos, business cards and radio advertisements were explored, including the economic imperatives or the desire to sell products that make money. The importance of communication and having a brand that is recognised and trusted were also analysed, as was the role that logos and business cards played in this.

Steve created ample opportunities for students to create persuasive texts for an advertising agency manager to use with potential clients. In other words, Steve gave the students opportunities to *apply* their knowledge of texts. This was done by engaging the students in creating texts that were *appropriate* to use within the context of advertising, such as logos, business mission statements and radio advertisements. He also gave them opportunities to apply their knowledge *creatively*, choosing their own product and developing a radio advertisement for it. The aspect of choice again offered diverse students the chance to follow areas of interest.

Engagement with the *Learning by Design* pedagogy directed Steve to consider how he might engage students with tasks and texts. As Steve planned

the learning sequence he was prompted to consider each of the pedagogies and how he might harness it for student learning. In response to these considerations he developed further ideas for learning. He became aware of his tendency to engage students in experiencing and applying, often overlooking the pedagogies of conceptualising and analysing. For example, in Table 5.2, Steve had proposed 'Internet research and collection of advertising company texts' followed by 'Creation of these advertising company texts'. He had also proposed 'Internet research and collection of radio advertisements' followed by 'Creation of a radio advertisement for product'. Upon reflection he realised he was failing to engage students in conceptualising and analysing texts.

As well as integrating a greater number of conceptualising and analysing tasks into the sequence of learning, Steve also took care to integrate a range of textual types and modes of meaning into his teaching (see columns 3 and 4 in Table 5.3). Students experienced, conceptualized, analysed and applied their learning through creation of a range of texts that represented varied modes of meaning. He found authenticity in this approach, as students came to know texts through engaging with them in four ways. As Steve explains:

It takes longer but the learning is deeper; the learning is in English, it's in Economics. But I am not 'teaching to a test' say on persuasive texts. I am teaching about persuasive texts but in context – that takes time. And I'm not just teaching about them; the students are experiencing them, developing a language to talk about them; critiquing them and then creating them. And they aren't just in print. We are attending to visual, to audio-visual – including the technology; and the technology takes time.

As well as driving the integration of Economics and English/literacy through the four knowledge processes, Steve considered appropriate opportunities for the integration of 21st century skills or general capabilities into the learning sequence (see column 5 in Table 5.3). He views this as being a more sophisticated approach that imitates the workplace. As he describes it:

It's a more mature sort of approach; it's like putting the students in an advertising company. Things go wrong and we have to problem-solve. We have to share resources. And then we want to share each other's work. And that's where the 21st century skills come in. They [the students] are working in teams; they are communicating with each other in multiple ways; they are reflecting and problem-solving; they are considering ethical aspects. They are connecting with knowledge at a much deeper level and they appreciate and respond to that. It takes more time but it's so worthwhile and how else can you teach all these things except in an integrated way?

Conclusion

As digital technologies enable and make desirable new kinds of human capital, school systems, schools and teachers are faced with mandates for teaching to encompass an expanding range of skills and capacities. Chief among the new desirables are student capacities in multimodal literacies and '21st century skills' or general capabilities. In an increasingly crowded curriculum, integrative approaches are a means of incorporating the teaching of a burgeoning array of desired skills and capacities into meaningful sequences.

However, there is a lack of consensus as to how the myriad approaches to integrated curriculum might be productively used in designing and implementing curriculum. Educators have differing pedagogical affinities and strengths; and concern for development of disciplinary knowledge remains strong.

In contrast to cross-curriculum or integrated approaches that are defined by relationships between school subjects, cohesive issues or organisational arrangements, *Learning by Design* offers a pedagogically-driven means of integrating within and across school subjects. This offers an alternative entry point to integration offering options for teacher reflection on practice. It can apply to integration within a subject area (for example of general capabilities) or across subject areas. It provides a means for teachers to audit the pedagogies being used and to prompt them to consider other alternatives. The *Learning by Design* model, which focuses on a range of integrative pedagogies rather than on the type of integrated curriculum, offers an alternative to teachers.

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6

Designing Think Trails: Using the Multiliteracies Pedagogy to Reshape Academic Knowledge into Clinical Competence

Marion Drew and Kathleen Stoop

This chapter explores an application of the Multiliteracies pedagogical framework to the instance of a medically oriented tertiary level course. The course is a second year level course in Audiology, co-taught at the University of the Witwatersrand, running over a seven-week period. The chapter outlines in detail how the course was structured in terms of both content and pedagogy, using the Multiliteracies framework as an overarching approach. It was felt that this was a particularly useful framework for a course of this nature, as it focuses on contextual issues beyond the immediate objectives of professional training, as well as the critical framing of knowledge. In addition, we outline the particular assessment tasks which were designed to: enhance student flexibility in working with different forms, modes and genres in which information is received and expressed; to promote integration of academic knowledge and the clinical application thereof; and to encourage engagement in multimodal work, with an emphasis on information technology. The responses of both the lecturers and the students to this approach were carefully documented and are presented along with suggestions for other educators working at tertiary level in similar fields, since it is felt that the application of the Multiliteracies pedagogy is particularly useful in these contexts.

In this chapter, we outline a curriculum innovation in the Discipline of Audiology in the School of Human and Community Development at the University of the Witwatersrand. A novel approach to curriculum design for a course “Pathology of the Ear” was developed using the pedagogical framework first put forward by the New London Group in 1996, in their paper “A Pedagogy of Multiliteracies: Designing Social Futures”.

In describing the profession of Audiology, Gary Jacobson (2002) states:

I believe that we are truly fortunate. We rehabilitate. We are paid, often handsomely, to restore the ability to communicate where it has been impaired. We are detectives. We piece together a puzzle that explains why a patient is dizzy or why a patient is disabled by tinnitus. We are

inventors. We go to work to develop and evaluate hypotheses that may ultimately yield new tools or treatment. (p. 54)

From the above quotation, it is evident that the work of an audiologist is multifaceted. The audiologist plays the role of rehabilitator, detective, and inventor in assisting with the prevention, identification, assessment, diagnosis and non-medical management of disorders of the auditory system (Report on Competency Profile of Speech-Language Therapists and Audiologists, 2002).

The training of audiologists (like the other therapeutic sciences) is challenging in that while learners are taught theory, they are being taught facts that need to be applied clinically. As diagnosticians, audiologists need to be able to recognize that a particular configuration of results on an audiological test battery, together with specific case history factors reported by the patient, suggests a particular pathology. Appropriate management of the patient depends on the audiologist being able to recognize the likely aetiology of the hearing loss. Hearing loss that can be treated medically should be referred for appropriate intervention.

While learners do undergo practical clinical training from a second-year level, those who do not have a strong academic base experience difficulty clinically. Although clinical experience certainly does play a role in the transference of academic knowledge into clinical skill, there is often an expectation that learners will successfully translate academic knowledge into clinical reasoning on their own through exposure to clinical cases. We believe, as do Lincoln, Stockhausen and Maloney (1997) that there cannot be growth in learning experience alone, but only by reflecting on experience. Bingham (1993, as cited in Lincoln, et al., 1997) argues that reflection is a learned process. He suggests that "the teaching of thinking, such as reflection, does not require huge changes in what we teach, but it may require a change in emphasis and some change in how we directly teach thinking skills." (p. 99).

We were attracted to the Multiliteracies framework for two main reasons. Firstly, within this framework, knowledge is located within increasingly cultural and linguistic diversity, and within the context of an increasingly globalized world. This is likely to impact directly on our students as the future professionals that we are training them to be, particularly in the South African context. In a country such as ours, we believe that a medical pathology has to be positioned within a social and political context. Our country has a very specific social and political history that has impacted on the healthcare system. In attempting to address the inequalities of the past, the Department of Health has introduced a year of compulsory community service for new graduates, so that services are introduced into previously disadvantaged communities. Given that some students may be placed in urban environments, while others may be placed in rural environments,

the introduction of community service made the negotiation of this diverse social fabric even more essential to their success as Audiologists. Secondly, there is a massively increased variety of forms, knowledge and information, driven by diverse technologies. We wished to tap into this variety in creating a specific teaching and learning environment for our students. We wanted to help our students “gain substantively in meta-cognitive and meta-linguistic abilities, and in their ability to reflect critically on complex systems and their interactions” (New London Group, 2000, p. 15) by using the Multiliteracies framework. We introduced a journal, in which students were to write weekly for the duration of the course, as a means of encouraging self-reflection.

The course “Pathology of the Ear” is medically oriented and deals with pathologies that could result in hearing loss or damage to the auditory or vestibular systems. Application of the facts taught in this course requires the “detective” skills that Jacobson (2002) refers to, and the “redesigning” of knowledge that the Multiliteracies theory refers to.

Traditionally, “Pathology of the Ear” had been taught using a very didactic approach, probably due the factual medical nature of the course content and the vast amount of information to be covered. It was generally understood that students had a firm foundation of the anatomy and physiology of the ear on which to build their knowledge of disease processes. Anatomy and physiology were neither revised nor integrated into the course in a conscious manner. The course also assumed that students were able to interpret the results of a basic audiological test battery. The focus of the course had thus traditionally been to provide the students with decontextualized facts regarding pathologies, such as age of onset, presenting symptoms, and disease process. The information was thus presented in a “rote” manner and students often failed to see the relevance of the information to their future working lives.

While this approach certainly does go some way towards addressing the issue of providing learners with content, it does not lend itself to application of the facts to previously acquired knowledge within a specific context.

We had noticed that our final year learners had difficulty applying knowledge of pathology despite clinical experience in hospital settings. This deeply concerned us, especially with the introduction of compulsory community service in 2003, which means that many of our new graduates are placed (without supervision) in rural areas that have not previously had services.

The pedagogical framework put forward by Cope and Kalantzis (2000) has four components, which “represent epistemological orientations, four ways of knowing, four ‘takes’ on the meaning of meanings that will provide learners with multifaceted ways of reading the world” (p. 241). The four components include *Overt Instruction/Conceptualizing*, *Situated Practice/Experiencing*, *Critical Framing/Analyzing* and *Transformed Practice/Applying*. It is important

to note that these four components do not constitute a linear hierarchy, nor do they represent stages. Rather, they are all ‘necessary to good teaching, albeit not in a rigid or sequential way’ (Cope & Kalantzis, 2000, p. 240). They are components, which are interrelated in complex ways. For the sake of clarity, we have attempted to discuss each component separately, but they are interfused to the extent that there is necessarily overlap. On reflection, we felt that this was one of the strengths of the pedagogy.

Cope and Kalantzis (2000) feel that educators have a greater responsibility to consider the implications of what is taught in relation to productive working lives. We were particularly concerned that our learners develop, amongst other things, a clear idea of how central the course is to their working lives and thus one of our aims in redesigning the course was to create a “working life” context in which to apply new knowledge.

Throughout the course, we asked our learners to keep a journal in which they documented their thoughts on the course.

Overt instruction/conceptualizing

The first component we addressed was Overt Instruction/Conceptualizing. Cope and Kalantzis (2000) describe this as including:

All those active interventions on the part of the teacher and other experts that scaffold learning activities; that focus the learner on the important features of their own experiences and activities within a community of learners; and that allow the learner to gain explicit information at times when it can most usefully organize and guide practice, building on and recruiting what the learner already knows and has already accomplished. (p. 33)

The particular group of learners that were taking the course were especially weak at anatomy, as evidenced by the fact that only 57% passed the previous year’s anatomy course. A clear understanding of the anatomy and physiology of the healthy ear is an essential base to understanding pathology. Our theory was that if students had a poor understanding of anatomy, they would not be able to “think” their way through a disease process and would thus try to rely on rote memory. We thus decided to specifically look at how we could integrate explicit teaching, or at least the revision of anatomy into the pathology lectures. We decided to frame the necessary facts in two ways:

1. We would follow the anatomy of the ear in a sequential manner - working from the outer ear to the inner ear, rather than pathology by pathology, thus organizing the information more usefully than had been done previously, and thus “allow(ing) the learner to gain explicit information at times when it can most usefully organize and guide practice.” (Cope & Kalantzis 2000, p. 33)

2. We would share the teaching between two lecturers in a very specific way, based not only on the information itself, but also on the relative strengths of the two lecturers. During the first two lessons, one lecturer would revise the anatomy and physiology of the ear and discuss what effect pathology in that part of the ear might have on a hearing assessment. During the other two lessons, the second lecturer would present the factual information on pathologies that affect that component of the ear within the context created by the first two lessons. In addition, she would try to contextualize the information socially and politically.

We hoped that framing the information in this manner would facilitate learners integrating their knowledge of anatomy and basic audiological testing with the newly acquired knowledge about pathology.

We felt that the pedagogy was useful in that Overt Instruction/Conceptualizing was merged with three other components meant that it was contextualised and supported by “Real Life” application for the students. The pedagogy also allowed us as educators to get behind the content and focus on the application of content to the learners’ future working life.

As lecturers, we were concerned that having two of us teaching simultaneously may be confusing for the students. We made the purpose of each of our lessons clear and explained how the co-lecturers’ lesson would complement the information. In a survey given to the class, we asked whether the learners would have preferred to have only one lecturer for the course. Only 23% of learners indicated that they would have preferred one lecturer for the course. The fact that some learners benefited from complementary input is evidenced from the following quotation from one of their diaries:

I really enjoyed this week’s lectures on the middle ear. I found them very interesting and relevant. I like the way the ‘anatomy’ part of the lectures were done the day before we did the pathologies and feel that the anatomy revision was essential and helped a lot.

Situated practice/experiencing

The second component of Multiliteracies theory that we deployed was Situated Practice/Experiencing, which Cope and Kalantzis (2000) refer to as “immersion in meaningful practices within a community of learners who are capable of playing multiple and different roles based on their backgrounds and experiences” (p. 33). We wished to address Situated Practice/Experiencing in three ways: firstly, we wanted to get learners to take responsibility for their own learning in a meaningful context; secondly we wanted to provide learners with a “safe environment” in which they felt secure to “take risks and trust(ing) the guidance of others” (p. 33); thirdly we wanted

to expose the learners to experts in related fields so that they could understand the application of their knowledge to the working world.

To address the first challenge, we designed what we refer to as a “Detective Exercise.” The purpose of the “Detective Exercise” was to encourage integration of knowledge of audiological test results and anatomy with pathology. The exercise was based on three case studies. Each case study was divided into information sections, based on the routine diagnostic procedures that audiologists follow in their working lives. The cases were specifically chosen because of their complexity. Each section of information in isolation suggested more than one pathology. However, when the information from all sections was viewed in an integrated way, only one likely pathology emerged. The learners were divided into groups and given one section of the information relating to the case study. The small groups discussed the information among themselves and then presented their conclusions to the class. The groups presented the information sequentially, so that each group was able to relate information from the previous group to their conclusion. Once all the information had been presented, the class as a whole was asked to debate the most likely pathology represented in the case study. The lecturers facilitated the discussion.

We addressed the second challenge in a number of ways. Firstly, we designed the Detective Exercise to be a tool for self-reflection so that students would evaluate where they were in terms of their own knowledge. The exercises allowed the lecturers to model clinical reasoning and to gain insight into the effectiveness of teaching. We emphasized that while a number of detective exercises would be completed in small groups and individually, none of them would be for marks (grades). We thus changed the focus from answers being right or wrong, to the discussion being open to debate. That students benefited from the exercises is demonstrated by the following journal entries:

I find that the detective work is useful because it ties up what we have learnt in lectures with the practical work.

Detective exercises make us think and show us how much we really know.

We felt strongly that the typical lecture structure was perhaps not a “safe environment” for all students. Cope and Kalantzis (2000) state that Situated Practice/Experiencing “must consider the affective and sociocultural needs and identities of all learners.” We felt that within the diversity of learners in our class, the tremendous variation in backgrounds (academic, social, cultural, and so on), we needed to provide a variety of opportunities for students to engage with the material to be learned as well as to demonstrate their understanding of the material covered. We thus decided to include two activities in the course to provide learners with an opportunity to interact informally. We relied on Gardner’s theory of multiple intelligences

expressed in the context of specific tasks (Gardner, 1991). We thus decided to change the nature of the task.

From the journal work that we received, it became clear to us that students did not understand the anatomy of the middle ear. This was first addressed by drawing a three-dimensional structure with the students and annotating it, as well as showing them color anatomical slides. Tracking their progress in their diaries suggested that the middle ear was still problematic conceptually. It became clear that we would need to change mode if the students were to understand the anatomy of the middle ear (which is critical to understanding otitis media or middle ear infection).

The first activity was to build a model of the middle ear. It was clear from Overt Instruction/Conceptualizing that many of the learners had difficulty in visualizing a three-dimensional structure that was represented two-dimensionally in textbook diagrams.

Students were provided with a box and asked to bring materials that they felt would be suitable to represent the anatomical structures found in the middle ear. The middle ear models were constructed as a group over a series of four lessons, with both the lecturers present. The learners were guided through the process by both the lecturers who acted as consultants and by fellow learners who were able to negotiate the spatial relation of anatomical structures. The learners were thus able to interact with one another to complete the task and draw on different levels of peer expertise.

The lecturers were initially concerned that the learners would regard the task of making a model as juvenile and unsuited to a tertiary level course. However, comments by students resolved those concerns. One typical comment was: "Making the model was very interesting, very helpful and a lot of fun! It puts everything into perspective—thanks for the amazing opportunity. It really helped me to understand and I was happy to do it!"

The second activity that was introduced was a dramatic enactment of the inner ear or cochlea. From Overt Instruction/Conceptualizing, it became clear that learners could grasp the anatomy of the inner ear, but not the physiology. They could recall the anatomical structures that constitute the inner ear, but did not understand how sound moved through the structure. The lecturers hired a hall for an afternoon. The students were divided into small groups and tasked with dramatically depicting how sound moves through the cochlea (inner ear). The learners were provided with posters and textbook, and could consult the lecturers for input. Once again, learners' comments provided evidence that the task had achieved what we had set out to:

I really enjoyed this experience of creating the inner ear dramatically. Not only was it lots of fun, but I also gained a lot in terms of knowledge.

Today's exercise was very different and extremely enjoyable. Acting out the pathway of sound through the inner ear was also a very good way of getting us involved in learning as opposed to sitting in class.

The third challenge of Situated Practice/Experiencing was addressed by inviting guest lecturers to speak to the class. The first guest lecturer was an Ear Nose and Throat specialist who discussed with the class how he relied on the results of audiological tests to make medical decisions. This had the effect of placing the students in a 'virtual' but authentic future-working environment. The ENT Specialist was able to contextualize for students how their work was part of a larger diagnostic medical process. The second guest lecturer was an audiologist who is a rehabilitation specialist working at a school for the Deaf. She deals with children who have severe to profound hearing losses, often as a result of a genetic disorder. She was able to give the students examples of real children who needed rehabilitation services due to a hearing disorder. This gave the students yet another perspective to their future roles as Audiologists, and how what they had learned could become relevant.

Critical framing/analyzing

The third component that we addressed was Critical Framing/Analyzing. This is the location of knowledge in its relevant context and reflection on its purpose. Kalantzis and Cope (2000) state that the goal of Critical Framing/Analyzing is to "help learners frame their own growing mastery ... in relation to the historical, social, political, ideological and value-centered relations of particular systems of knowledge and social practice".

We introduced the notion of critical framing by showing a video of surgery to provide a prosthetic ear to a woman who had been born without an outer ear. We posed questions regarding access to such surgery in a developing country and explored the reactions of different cultural groups to deformity.

We chose one pathology to ensure that the component of Critical Framing/Analyzing was strongly present. We chose Otitis media, which refers to a middle ear infection, which is a common ear pathology that affects young children. Otitis media is also a disease that is frequently associated with poor living conditions and is common in children who are HIV positive. It is a common childhood ailment and is usually diagnosed by a general practitioner. In class we discussed with the students the prevalence of the disease in young children, particularly in those communities in which they would be spending their year of community service, issues of access to basic healthcare, the often devastating consequences of non-treatment of the disease, and the role that traditional healers may play in the community. We posed questions such as "Who has control over this pathology and its treatment?" We wanted to challenge learners to think about issues such as: the manner in which the western medical model is taken for granted; the manner in which certain groups have difficulty in accessing effective treatment; the manner in which indigenous approaches to treatment are marginalized.

The second way in which we tried to heighten awareness of these issues was to set an assignment in which they had to interview someone of an older generation or someone of another healing persuasion and research “traditional,” “folk,” or “alternative” remedies for otitis media. We wanted learners to experience for themselves through “real life” interviews, that people use remedies that lie outside the realm of traditional western medicine, some with positive effects. That the assignment complemented Overt Instruction/Conceptualizing was evidenced by the following journal excerpt: “With the interview assignment, the concept of otitis media is becoming clearer and it is easier to apply the concept to real-life patients and situations.”

Transformed practice/applying

The last component of the Multiliteracies pedagogy that we explored was Transformed Practice/Applying. This refers to a “re-practice, where theory becomes reflective practice” in a context where they can “simultaneously apply and revise that they have learned” (Cope & Kalantzis, 2000, p. 35).

We felt that our task at this stage was to get students to become active themselves in recreating the discourse of pathology and putting it to work in novel and yet authentic situations. Appropriate assessment is the cornerstone of the transformed educational system in South Africa. Eisner (1993) states that assessment “should reveal how students go about solving a problem, not only the solutions they formulate” (p. 226).

This was accomplished by setting two related assignments. The learners were allowed to select pathology that was not covered in class from a list provided and to then complete two assignments on the same pathology. The first assignment was to design a website for lay persons (parents and spouses) on their chosen pathology. The second assignment was to produce a textbook chapter for ENT specialists on the same pathology. In setting these assignments, we hoped to achieve and number of things:

1. To facilitate engagement in meaningful research.
2. To promote flexibility in the manner in which learners convey knowledge, by having them reflect on, reframe, and in Multiliteracies terms to redesign the information that they had been given. This is an important skill as a practising professional, as one needs to converse with both an Ear, Nose, and Throat Specialist and the mother of a sick child concerning the condition.
3. To bring learners into direct contact with the World Wide Web, which uses a specific medium, a particular genre and a different way of encoding information, and one which demands intellectual as well as creative rigour.
4. To encourage learners to think of themselves as capable future audiologists.

Having completed the assignments, we asked students in a survey whether they felt that the course had taught them to explain information in different

ways. Seventy-four percent of students responded that they felt that the course had provided them with this skill.

In reflecting on this process we concluded that the Multiliteracies pedagogy had two major impacts on this course. The first impact is concerned with the student's learning, while the second is related to our thinking as lecturers and designers of the course.

The impact on student learning

With the focus in our teaching on developing a specific attitude to learning in the context of this course, and to developing an "audiological thinking" style in the students, we feel that what was accomplished was a new "thinking trail" in students. The term "think trail" was taken from one of the student's journal entries:

The detective exercise was interesting and very mind boggling, forcing us to think audiologically. I think that this is the most difficult part because we have to put all different information together. We have to think broadly of multiple causes and predicting a pathology is the hardest because there are so many to choose from and their symptoms are similar. The lectures have held in a sense that it opened up the think trail.

In order to quantify whether we had succeeded in providing students with the skill of recognizing a pathology on the basis of case history information and the results of audiological testing, we set the mid-year exam in such a way that students were presented with six case studies and as part of the examination question, had to identify the presenting pathology. As a control, we presented the same cases to our final year students in their mid-year oral examination. Our most challenging question was a case of a where the patient was feigning a hearing loss (referred to as an "inorganic hearing loss" in the literature). While the case history of the patient suggested a number of pathologies, the results of audiological testing did not confirm any of the pathologies. Only one out of 34 second year students was unable to diagnose that the client had an inorganic hearing loss. In sharp contrast, only one out of eight final year students was able to correctly diagnose the client and make appropriate recommendations.

The impact on lecturers as designers of the course

Using the Multiliteracies pedagogy as a framework for the course forced us to think beyond the traditional boundaries set by teaching in a medical module such as this. Traditional teaching in this course approached pathology in a way that disconnected it from the real social, political and personal contexts in which it occurs, and imparted knowledge regarding pathology in a way that it disregarded the context of the real working world of the Audiologist. One of our learners stated that: "I really like the way

the lectures are structured. If our lectures were structured like this in other subjects, I think we would all do a lot better in them”.

We felt that implicit in the Multiliteracies framework was “permission” to use multiple modes and media to teach concepts. Working with the models of the middle ear took the students out of the traditional “pen and paper” approach to learning and into a mode where anatomical facts and concepts were represented in a way which made them more accessible, less abstract and closer to anatomical reality, as evidenced by the comment: “The model of the middle ear we are making in class is actually helpful. I can remember this structure much more easily now since we’ve actually created it physically.”

We found that the Multiliteracies framework was a very useful tool in terms of approaching the design of the curriculum and its accompanying assessment tasks. Our approach to the course was based on different premises to those previously used, and which proved to be much more fruitful. For example we used the students’ existing (or lack of) knowledge of anatomy as an explicit foundation from which to work, rather than using a given pathology itself as the starting point. This allowed a more coherent and logical curriculum to emerge, which was based on principles rather than on facts, and on an approach to thinking, rather than rote learning. We felt that students could then internalize principles and an investigative diagnostic style of thinking, take these forward into subsequent years of study, and eventually into their places of work.

In terms of assessment, the activities and assignments that we utilized were directly based on our interpretation of the pedagogy, which allowed us a much greater scope for possibilities than would have been the case had we taken a more didactic approach to teaching and learning. Our outcomes for the course were directly focused on the students’ future world of work.

We found the Multiliteracies framework to be a very finely-tuned tracking device for gaining insight into how students were engaging with the course. We were interested in how students took knowledge on board in terms of how they were learning to integrate sets of understandings, to apply a set of facts about a given pathology to the dynamic context of real human beings and to literally redesigning their own way of thinking about hearing disorders. We found that being able to constantly revisit our presentation of the course within the structure of Overt Instruction/Conceptualizing, Critical Framing/Analyzing, Situated Practice/Experiencing, and Transformed Practice/Applying, and allowed us to move between these four pedagogical moves in response to the way students were receiving the course material and teaching approaches. This gave us insights that we feel we would otherwise have been oblivious to.

The Multiliteracies pedagogy allowed us to interrogate more closely questions in relation to our diverse student body concerning the nature of competence versus capacity in relation to what kind of person with what kinds of skills we are putting out into the world of work.

A learner summed up what we felt using the Multiliteracies framework had contributed to the course in the following comment:

“I have learned to think more...”

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7

Co-Constructed by Design: Knowledge Processes in a Fluid “Cloud Curriculum”

Kathryn Hibbert, Mary Ott and Luigi Iannacci

Two concurrent trends converge in contemporary education: the first acknowledges educational activities as social and situated prompting us to imagine new roles for community in teaching and learning; the second attends to our abilities to differentiate and individualize activities, to be responsive to learner needs. Multiliteracies theorists contend that learning can be understood as a process of “weaving” backward and forward across and between different pedagogical moves. Using “knowledge processes” as a theoretical lens, we explore the pedagogical moves possible when we take an award winning curricular approach to teaching Shakespeare and work with it in the context of a dynamic “cloud”; a generative, flexible and participatory space where learners, educators and developers are integral to the process of “curriculum making.” We offer examples of the multiple opportunities for the pedagogies of “new teacher” and “new learning” to emerge when a space for invention is created.

Introduction

Advances in technologies and new media have unquestionably expanded our understanding of literacies and have transformed the pedagogies that can be used to respond to the diverse 21st century needs of both teachers and students. These revolutionary changes have, however, coincided and collided with a standardization movement in education which has narrowed conceptualizations and enactments of curriculum, and limited understandings of what constitutes valid assessment and evaluation practices. In a context of increased neoliberal and fiscal monitoring and surveillance, curricular design has privileged “top-down” approaches positioning teachers as “disseminators” rather than “discerners” (Hibbert & Iannacci, 2005). Surveillance, measuring and ranking of children, teachers and schools has become a core activity of educational institutions:

Measurement helps to control the complexity of government for it is through measurement that children’s lives can be reduced to the smallest number of characteristics in the shortest time available. Indeed, the

measurement of children can operate in ways which deny individuals any identity whatsoever.

(Billington, 2012, p. 26)

The limitations of this narrow view of children are experienced by educators who work with the complexities of students' lives – comprised of diverse cultures, languages and abilities (Gollnick & Chinn, 2002). The disconnect between the *imperative for simplicity* desired by accountability regimes and an *imperative for acknowledging complexity* expressed by educators has prompted a call to view student diversity as an asset – rather than as a deficit in need of fixing, remediating and pathologizing (Heydon & Iannacci, 2008). For example, students who do not respond well to traditionally privileged forms of print literacy are often identified as “at risk”: signaling concern about their academic success. We have argued elsewhere that at-risk students need risk-taking teachers (Hibbert et al., 2012), policy makers, and leaders who work with them to expand opportunities to engage in literacy - ways that enable students to construct identities as literacy learners.

The participatory culture (e.g., affiliations enabled through social media; expressions enabled through Web 2.0; collaborative problem solving; sharing) that has emerged over the past two decades expanded opportunities for teachers and learners to foster and further their agency, unique knowledge, skills, identities, and subjectivities in ways that produce knowledge, and shape pedagogical options and responses. Jenkins (2006) first described the participatory culture as one “with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one’s creations, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices” (p.3). In this chapter, we bring a participatory sensibility to the curricular design process to examine how we can build from the four “knowledge processes” (Kalantzis & Cope, 2005): experiencing, conceptualizing, analyzing and applying to learn *What can curriculum become when its design is co-constructed by its participants?* We focus our inquiry in a nascent and flexible “cloud curriculum” (Hibbert, 2015) built upon the worldwide success of writing curricula developed by Lois Burdett.¹

Background

The standardization movement

The “standardization movement,” as it has come to be known, was ushered in to schools across North America over the past two decades in response to an American report, *A Nation at Risk: The Imperative for Education Reform* (National Commission of Excellence in Education, 1983) that claimed students were “at risk” and outperformed by their peers in other industrialized countries. In the neoliberal context, an emerging “knowledge economy”

was viewed as an untapped “market.” Influenced by *The Frasier Institute* (an “independent and non-partisan research organization based in Canada²”) and their uncritical belief in “standards-based” accountability reforms, Ontario adopted standardized curriculum and provincial and electronic report cards. An annual standardized assessment process was introduced through a newly created “Education Quality and Accountability Office” (EQAO) in Grades three, six and nine followed by an “Ontario Secondary School Literacy Test” in Grade 10. At about the same time, the Ontario College of Teachers was established, complete with guidelines and surveillance mechanisms. These moves aligned well with the Frasier Institute’s mantra, “If it matters, measure it” (Carlson, 2012, np).

Assessment

When the impetus for “evidence based” combined with the imperative to “measure” in systematized and systematic ways, what actually “counts” became the kinds of things that can be counted. In the literacy field, what is easy to measure are largely what Rosenblatt referred to as the “efferent” bits that relate to information acquisition. Those “bits” could be gleaned more quickly and superficially than the more time-intensive, messier work of meaning making in deep, “aesthetic” ways. In order to control the “tests,” packages of paper booklets with precise instructions arrive at schools; all visual literacy supports in the classroom are removed, and students, pencils in hand, fill out the small circles, short answer and short essay questions. The “appearance of systemic process and the alignment of curricula, instructions and evaluation” appealed to a public who were led to believe that their children might fall behind (Kim, 2010, p. 11). In an increasingly globalized and mobile world, where competition is viewed as universally “good,” attention to schools, teachers and student performance is intensified. Contrast this with Pink’s (2009) argument that what is needed to compete in the global economy is creativity and innovation – incommensurate with the current system which produces good followers. Too often, education remains largely content-driven and print-based, ignoring the social, cultural, situatedness of a student’s interpretation and response. The “marketization” of education that spawned from this form of education hobbles both teachers and students (Hibbert & Iannacci, 2005) as it secures curriculum “alignment” with products, thus diminishing teachers’ abilities to create and perform responsive and engaging instruction that fosters their own decision-making and creativity. It is within this commercial and standardizing context that private learning and tutoring centers flourished. Paradoxically, classrooms were growing increasingly diverse. Along with differences in culture, ethnicity, religion, and gender – to name a few – the “inclusive classroom” model ensured students with identified learning needs remained in the “regular” classroom. The “market” was ready for the sudden demand for products and services: kits, packages and programs and supplementary “teacher training,”

often uncritically adopted by school boards and teachers, desperate to raise achievement levels and cope with increasing diversity.

“New teacher consumerism”

The de-skilling of teachers was a disconcerting outcome of standardized curriculum and mass purchasing of programs produced to deliver a curriculum developed far from the unique and distinctive classrooms in a diverse, multicultural country like Canada. Within this context, educators began to see their new roles as “disseminators” of the product (e.g., “I am a Four Blocks™ Teacher”). Our work as literacy teacher educators during this time became focused on ensuring that teachers remained “actively involved in the process of selecting and modifying materials for their students” (Hibbert & Iannacci, 2005, p. 716); in effect, we fostering their ability to become “critical consumers.”

Changing views of literacy

In a (2002) resolution, UNESCO asserted: Literacy policies and programmes today require going beyond the limited view of literacy that has dominated in the past ... In order to survive in today's globalized world, it has become necessary for everyone to learn new forms of literacy and to develop the ability to locate, evaluate and effectively use information in a variety of ways. (np)

For years, literacy learning was largely influenced by research in psychology where the ability to learn (in this case, to read and write) was attributed to individual characteristics and skills, reducing children's lives into measurable components. Reading was simply encoding or decoding print, and language was mastering vocabulary, forms or structures (Hawkins, 2013; Kalantzis & Cope, 2013). As literacy scholarship has undergone a “social turn,” researchers' attention has shifted to learning produced *through* human activities, interactions and practices (Larson & Marsh, 2005; Kadjer, 2010).

Anthropologist Michael Wesch has argued that in order to become knowledgeable, we must first become “knowledge-able”; a practice he argues emerges from engaging in real problems with relevant others while harnessing important tools. We draw on Multiliteracies and “new literacies” theories for their acknowledgment of the growing cultural and linguistic diversity in classrooms, and the multiplicity of “texts” (e.g., written linguistic modes, visual, audio, gestural, tactile and spatial (Cope & Kalantzis, 2009)). Schools need to promote an “active, bottom-up citizenship in which people can take a self-governing role in the many divergent communities of their lives - the work teams, their professions, neighborhoods, ethnic associations, environments, voluntary organizations and affinity groups” (p. 172). A Multiliteracies approach is a pedagogy for active citizenship.

It positions learners as “agents in their own knowledge processes” (p. 172), and respects the fluid nature of learning.

Designing and re-designing

Design, within a Multiliteracies framework, is about meaning making. A *pedagogy of Multiliteracies* recognizes the active role of those engaged in teaching and learning, the cultural and situational basis, and the reality of an ever-changing context. The goal is not to simply teach “structures, or forms or modalities” but to “design learning experiences through which learners develop strategies for reading the new and unfamiliar, in whatever form these may manifest themselves” (Cope & Kalantzis, 2009, p. 176–177) (Figure 7.1).

Becoming an effective “Multiliteracies teacher” requires that as educators, we become effective readers and writers of multimodal texts with the ability to negotiate discourse differences (Hibbert, 2013). It invites us to think about teaching as “changing participation” (Rogoff, 2003). Children have a natural ability to shift from one mode to another, however, “rather than build upon and extend these ... school literacy attempts to separate them” (Cope & Kalantzis, 2009, p. 179–180). An “artificially segregated mode” (e.g., print) tends to favor some types of learners over others. In fact, O’Brien (2001) argues that students can be considered capable and literate when viewed through the “perspective of Multiliteracies” (np). Learners need the freedom to explore meaning-making through multiple avenues in order to learn how to express themselves, find out what they are good at, and learn how their choice from amongst many communication options is received by various audiences. Their primary choice of mode and medium can form the basis to build additional forms for different audiences, contexts and purposes, helping them to understand the value and significance of each.

Theoretical framework

Recognizing that our disciplinary ways of framing, selecting and highlighting valued practices within our respective social practices shape our theoretical approaches to scholarship and configure practice (Bezemer & Meyers, 2011), we draw on the four knowledge processes: experiencing,

Available designs	Found and findable resources for meaning: culture, context and purpose-specific patterns and conventions of meaning making.
Designing	The act of meaning: work performed on/with Available Designs in representing the world or other's representations of it, to oneself or others.
The redesigned	The world transformed, in the form of new Available Designs, or the meaning designer who, through the very act of Designing, has transformed themselves (learning).

Figure 7.1 The “What” of Multiliteracies – designs of meaning

conceptualizing, analyzing and applying, as we review the first phase of a curriculum designed for participation. Specifically, we aim to identify those spaces where, through a Multiliteracies lens, we can weave new learning. It is an inclusive approach that embraces multiple ways of developing proficiency with various forms of text; accessing multiple modes and media that expand the communication options adopted and developed along the route to proficiency. At the heart of our choices for assessment lies our vision of schooling (Murphy, 1998). A Multiliteracies approach acknowledges the power and privilege associated with literacy, and explicitly aims to unpack the ways in which power functions within and across texts. In this way, learners can develop a critical frame that allows them to better advocate for their needs.

“Cloud curriculum”

The “cloud curriculum” has been conceptualized as a generative space that requires teacher and student participation in its ongoing evolution. Its fluidity and flexibility hearken back to Vygotsky’s (1978) notion of mediated engagement with more experienced others. Like a “touchstone text” (Calkins, 1994) or “mentor text” (Ray, 2004; Gainer, 2013) the “cloud curriculum” can, as a starting point, guide or inspire others who have been excluded from participating as curriculum “makers.” In this way, it becomes a “space of invention” (Lesnick et al., 2004, p. 36) as well as an organically developed place for relational pedagogical documentation that goes well beyond observation and is comprised of submissions from both teachers and learners. The ability to build communities with other classrooms and teachers lends itself to being an organic space for professional growth and sharing of ideas. It positions all involved in the process as learners, seeking to continually progress and grow through their knowledge and interaction with each other, their environment and the tools available to them.

A Midsummer Night’s Dream

One of the enduring ideas in Shakespeare’s *A Midsummer Night’s Dream* is that we have much to learn from one another. A research partnership was formalized between Western University (Hibbert) and a local start-up, QWILL Media and Education, Inc.³ QWILL has developed a prototype digital curriculum based on the teaching and books by Canadian educator, Lois Burdett. Burdett is a world-renowned elementary school teacher, award-winning author, and international guest lecturer. Over the past 30 years she has established a language arts curriculum that has received international acclaim for its promotion of listening, speaking, reading, self-confidence, self-esteem, and quality writing. In many ways, this partnership brings our earlier notions of “good teacher consumerism” to life.

In order to move beyond naïve past ideals of “purchased pedagogy” (Hibbert & Iannacci, 2005) and glorified online textbooks with this project,

educators must participate fully as curriculum makers, weaving backward and forward through their emerging understanding of Multiliteracies theories. As curriculum scholar A.V. Kelly cautions, “teachers [need] to have a sound theoretical perspective as a defense against the imposition on them of policies framed by amateurs” (p. 2).

The prototype, developed for Shakespeare’s *A Midsummer Night’s Dream* (Figure 7.2) has been created in the form of an “e-magazine” with pages that flip and buttons that help you navigate back and forth from the macro-organizational perspective of a chapter overview, through to the micro-views of individual lessons. Each of the 22 chapters designed for the play consist of lessons that fall into one of two categories: “Exploring the Text” lessons or “Quoting the Bard” lessons. In “Exploring the Text,” participants begin by working with an adapted version of Shakespeare’s work written by Burdett and designed to scaffold learners into Shakespeare’s linguistic world. In the “Quoting the Bard” lessons, participants work with Shakespeare’s original language to gain insight into the power of language, structures and purposes. Its core design includes those pieces that have traditionally been included in a standardized curriculum that would lend familiarity and reassurance: learning expectations, projectables (e.g., anchor charts and pre-writing models) and printables (e.g., active learning cards, assessment templates and “Blackline masters”). We reviewed the prototype to locate opportunities to enhance the pedagogical moves possible in this 21st century format (Figure 7.3).



Figure 7.2 “Seeing it my way”

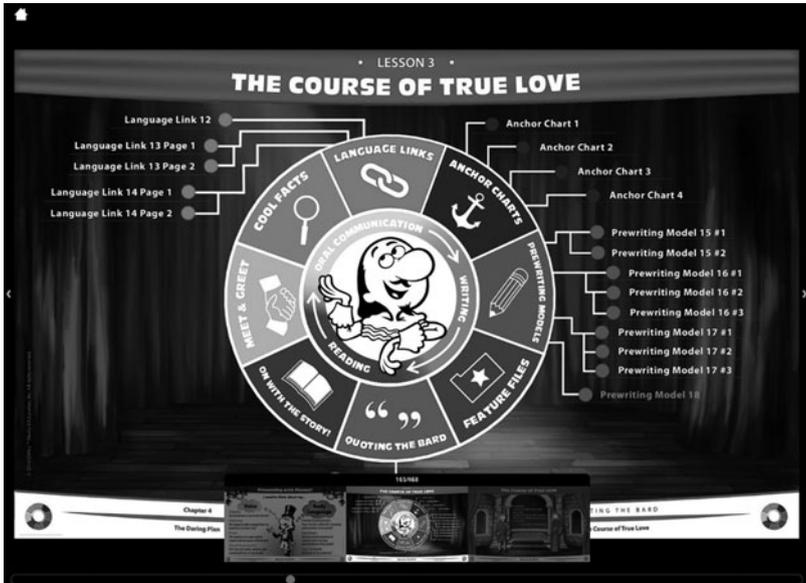


Figure 7.3 The course of true love

Following Cope and Kalantzis (2005; 2009), we see a pedagogy of Multiliteracies as embracing a range of pedagogical moves including experiencing, conceptualizing, analyzing and applying; where “meaning makers do not simply use what they have been given: they are fully makers and remakers of signs and transformers of meaning” (Cope & Kalantzis, 2009, p. 175): a shift from working with *Available Designs* to *Designing* (Kalantzis & Cope, 2010). In this project, our focus would include attention to the *Redesigned*: “one person’s designing becomes a resource in another person’s *Available Designs*” (p. 177) where our inquiry produces a “map of the range of pedagogical moves that may prompt teachers [and in this case, QWILL designers] to extend their pedagogical repertoires” (Cope & Kalantzis, 2009, p. 186).

Discussion and insights

It is perhaps important to recall that conceptually, as a “cloud curriculum,” the materials are by design a malleable and flexible set of curricular “texts” “situated” in various socio-political, cultural and historical contexts. It is thus comprised of a core set of materials grounded in solid research, years of pedagogical expertise, and reflecting to some degree the accountability demands of particular school systems. In this way, it comprises what Cope

and Kalantzis (2009) refer to as *Available Designs*. Interactivity built into the prototype is what affords participants multiple opportunities to *Design* in ways that draw on participants (teachers' and students') individual subjectivities, histories, knowledge and purposes. Working with designs, generating inspired new designs and activating the creativity and imagination of users are at the "centre of representation and thus learning" (p. 177). Opportunities to document, share, repurpose and build on those designs comprise the *Redesigned*: those "traces of transformation that are left in the social world" (p. 177). Using the *knowledge processes* of experiencing, conceptualizing, analyzing and applying as an organizational frame, we map a range of pedagogical moves to illustrate *what is*, and then place it in the context of 21st century literacies to imagine *what might be* as we leverage the affordances of the cloud. Just as we recognize that a single dominant form of literacy must give way to a changing literacy landscape, we also understand that dominant "stand-alone" pedagogies are insufficient to enact the range of pedagogical moves that are required for deep and meaningful growth.

Experiencing

Educators have long understood the need to draw on students "funds of knowledge" (Moll et al., 1992) as a pedagogical starting point. There are multiple opportunities built in to this prototype to scaffold experiences of the known with experiences of the new or less familiar. Burdett has rewritten Shakespeare's plays into accessible language for learners that allow them to become immersed in the story and make connections between the lives of the characters and their own. The activities in this curriculum promote active listening, speaking, reading, performing and writing in supported, multi-modal ways (e.g., role playing, inverted sentence game, shared reading). The *Available Designs* provided offer explicit guidance for the novice teacher, and include traditional forms of writing (e.g., writing a friendly letter).

"New learners" (Kalantzis & Cope, 2010), however, collaborate in authentic knowledge activities with their peers and are "comfortable player[s] in environments where intelligence is collective" (pp. 204–205). "New Teachers" become "purposeful learning designers" as they work with their students. To leverage the affordances of the "cloud," we need to weave in lessons that reflect the lives of the participants. For example, teachers and students could bring in examples of the kinds of writing they engage in outside of school, such as social media, blogs, video logs, and email. Drawing on the lessons from the core curriculum, they could compose, "design" and share new or revised activities and models that reflect who they are and how they use language and literacy in their everyday lives. These new designs can be added to the repertoire of a defined community of users or promoted to all. Rather than all of the experiences being designed by others, in the "cloud curriculum," mechanisms are built in that allow the users to engage with the quality materials in ways that inspire understanding and thinking.

Conceptualizing

Although not named as such, there are multiple elements in the prototype curriculum that would lead teachers and learners to become active conceptualizers: “making the tacit explicit and generalizing from the particular”. The 22 chapters are replete with models that function as schematics for thinking, planning, writing, and interpreting. In addition, students have opportunities to see models or frameworks that others build (e.g., Literacy Cabaret) and to use and create graphic organizers. There are many opportunities to leverage the affordances of the cloud in this context. To begin with, the models, charts and activities could be promoted as documents that can be easily tailored to the unique characteristics of each class (adapting the language, the vocabulary, the instructions and the activities). Models of scenes could be included using podcasts and video; comparative interpretations could be included to show the influence of a director; teachers and students could record their own interpretations and models and share them with others, extending the all-important audience for this type of activity. Rating systems (e.g., Digg, Reddit) could be devised and applied. Participants could select and build an individualized program with software that functions like Pinterest or create an individual “playlist.” The prototype has been carefully crafted to create a bridge between the strength of traditional literacy pedagogies and the affordances opened up in the new literacies pedagogies.

Analyzing

The models that are provided in the core curriculum include an activity that explicitly invites the participants to analyze their features (Figure 7.4). There are multiple opportunities to give and receive feedback (e.g., partner share), assessments (writing conferences, rubrics, self-assessment checklists). Analysis and assessment in a cloud curriculum has enormous potential to weave bi-directionally (Cope & Kalantzis, 2009). “New Learners” Kalantzis & Cope (2010) remind us, “critically self-assess and reflect on their learning” (p. 204). They give feedback “in social networking interactions, learning in recursive feedback loops involving parents, experts and invited critical friends, as well as teachers” (p. 204). In this context, participants are knowledge producers and assessment of a collective intelligence must be captured and documented in new ways. It will not always be possible to predict what the outcomes will be, and where new learning will take us. This necessitates a new professional identity for teachers: “less of a talking profession and more ... documenting ... Creates and implements ubiquitous assessment ‘for learning’ not just end-of-program assessment ‘of learning’ (p. 204).” At the same time, teachers create and apply “evaluation protocols to measure the effectiveness of pedagogies and programs”. Opportunities for students and teachers to design or re-design their own organizers, storyboards, and models where they begin to understand critically the texts that they are working with and the purposes of those texts

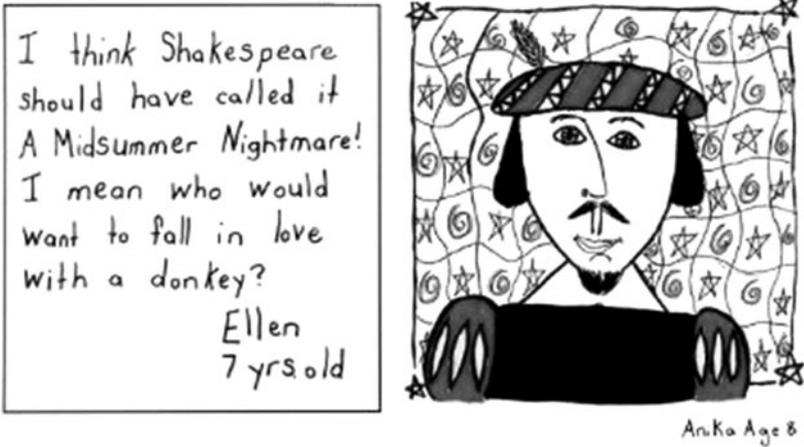


Figure 7.4 Midsummer nightmare

Source: From Burdett, L. (1997). *A Midsummer Night's Dream for Kids*. Buffalo, NY: Firefly Books.

lends meaning to the process of engaging with the curriculum as active participants. In this way, recognizing, documenting, and sharing the learning along the way becomes as important, if not more, than summative assessments.

Applying

Opportunities to apply learning are consistently woven in and out of the lessons. For example, a regular feature entitled “Extension Cords: Connecting the curriculum” invites participants to consider dilemmas the characters face in the context of their own lives. They are also invited to speculate and create new ways to deal with situations in the modern world, design and create their own labyrinths, develop empathy, see the “familiar” in new ways through an exercise of pantomime. In this way, “new learners” (Kalantzis & Cope, 2010) “belong in their learning, connecting their identity, subjectivity and agency in their learning” and bring their “experience, interests and voice to the learning task at hand” (p. 204). Similarly, “new teachers” “harness lateral knowledge-making energies amongst learners” (p. 204). In a cloud curriculum, we can take advantage of the numerous “plug-ins” that are being used in schools to support learners’ abilities to apply their learning in multimodal ways. For example, students may want to create a scene that they have been studying using “Animoto”; or have a dialogue of what characters might have said in different circumstances using “Audacity.” They might opt to share a lesson design or performance on YouTube or Instagram, embedding opportunities for students to share their work with others locally, regionally or internationally. They can share their

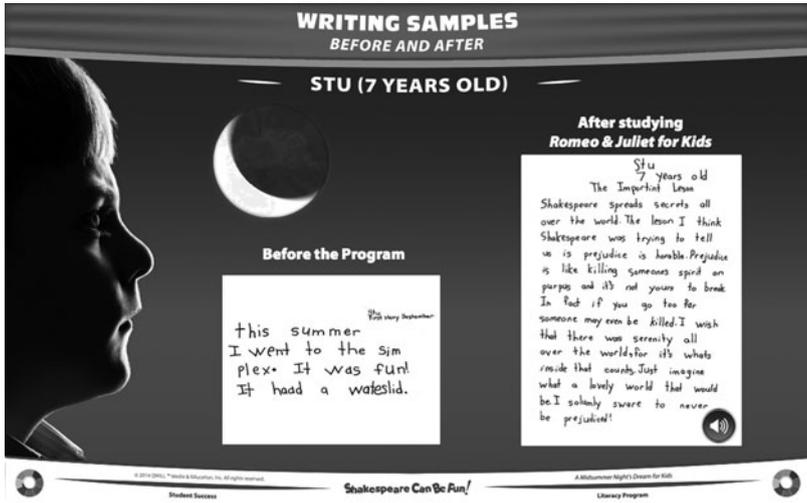


Figure 7.5 Stu: seven years old

progress, written and spoken, in ways that make accountability visible (Figure 7.5). The ability to tailor the application to their particular interests allows them to innovate, “take intellectual risks,” apply what they have learned to new contexts, pose new problems and “translate knowledge into a different mix of ‘modes’ of meaning” (Van Haren, <http://newlearningonline.com/learning-by-design/the-knowledge-processes>). Moreover, ongoing feedback can be gathered, collated and fed back into the development cycles to continually improve on flexibility, advances in technology and user experiences.

Conclusions

What we’ve attempted to offer here is one tangible and concrete alternative to the dominant and problematic standardized/commercialized context that we have been and currently are experiencing. In a Web 2.0 era, the boxed sets are disappearing and the “Available Designs” are online. The “new teacher” needs to be both a critical designer and a wise consumer. The “cloud” curriculum we’ve explored directly contradicts unresponsive and inflexible curricula that are a result of accountability (defined narrowly) measures that have essentially positioned learners, teachers, schools and education in general as deficient and in need of being narrowed in ways that deaden creativity and active, critical participation. The “cloud” curriculum as it has been experienced, conceptualized, analyzed and applied allows us to clearly see

possibilities reflective of Multiliteracies perspectives and pedagogies, and to envision how they can enable schools to become transformational spaces where curricula is dynamic, fluid and reflective of those who negotiate and co-construct it, thus becoming places that allow democratic citizenship to flourish. We wholeheartedly agree with Gilbert K. Chesterton who stated that “There are no rules of architecture for a castle in the clouds” (p. 135). What we offer is neither prescriptive nor rule-bound, but rather what has been made possible by a teacher committed to building castles in clouds with her students. It signals the urgency to weave or map the pedagogical moves needed to meet the diversity of student needs. It helps us work critically with Available Designs, by offering the framework of the “knowledge processes” to think through alternative ways to conduct ourselves. Beyond the traditional textbook, a “Redesigned” pedagogy opened up in the “cloud curriculum” affords the creativity, collaboration and community that people have come to expect from a digital platform. In this context, the “new teacher” is a leader in a dynamic, knowledge-producing community ... [and] a practitioner-researcher, building and interpreting the evidence base of pedagogical inputs in relation to learner outcomes (Kalantzis & Cope, 2010, p. 205). The emerging design of this innovative curriculum honors and respects the knowledge, experiences and identities of the “new teacher” and the “new learner” by building an innovative, responsive curriculum that features the best of both worlds.

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Notes

1. Burdett is author of the internationally acclaimed “Shakespeare Can Be Fun” series of books. She combined talents with Andrew Lester to form QWILL Media & Education, Inc. to develop a digital curriculum to accompany the books. QWILL partnered with Western University to allow researchers to use the curricula as a “digital sandbox” to expand possibilities for 21st C Teaching and Learning. A “Material Transfer Agreement” is in place articulating that Western has no commercial interest or benefit from the project, and is free to conduct independent research.
2. <http://www.fraserinstitute.org/about-us/overview.aspx>
3. QWILL Media and Education Inc. is a company established by Lois Burdett and Andrew Lester. A “Material Transfer Agreement” was put in place to protect the intellectual property of QWILL and ensure the independent research of Western. It also articulates that Western and its researchers have no financial interest or compensation from the relationship.

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8

Implementing *Learning by Design*: Teachers' Reflections

Denice Ward Hood

This chapter presents the results from interviews conducted with a sample of Australian, American and Greek teachers who have used Learning by Design for varying lengths of time ranging from a few months to several years. The Learning by Design objectives and principles, as well as Shulman's (1987) pedagogical reasoning and action framework, were employed as interpretive structures. The interviews with seven teachers yielded practical perspectives and reflections on the extent to which and the ways in which their involvement with Learning by Design impacted their transformation of content knowledge, classroom practice, approach to lesson design, and student outcomes.

***Learning by Design* background**

The *Learning by Design* (L-by-D) project reconfigures traditional curriculum design and instructional roles (Kalantzis & Cope, 2010 & 2012). Using the web-based knowledge management system, teachers create, teach, edit and share lessons. As the teacher gets started designing a Learning Element, she can use the pen-and-paper drafting space called a *placemat*. The *placemat* is divided into quadrants that correspond to the Knowledge Processes (Experiencing, Conceptualizing, Analyzing, Applying), and the user can sort ideas for student activities within each quadrant. The *Learning Elements* are online modules of teaching content, consisting of closely interconnected online spaces. L-by-D is intended to address the following outcomes in P-12 education:

- Engage teachers as reflective practitioners systematically assessing and evaluating the outcomes of their own and their peers' pedagogical practices
- Develop teachers' capacities for instructional design
- More effectively address learning diversity
- Encourage teachers and schools to adopt a knowledge management approach to documenting and sharing best practices

Pedagogical reasoning and reflective practice

Shulman's model of *pedagogical reasoning and action* (1987) is an analytical framework for understanding what teachers do and their professional development as educators. Specifically, Shulman described pedagogical reasoning as a combination of "subject-matter understanding and pedagogical skill" (p.2) encompassing multiple instructional techniques. The pedagogical reasoning model articulates the components of teachers' reflective practice during the teaching process (Starkey, 2010). Fenstermacher (1986) (as cited in Shulman, 1987) proposed that the goal of teacher education is to "educate teachers to reason soundly about their teaching as well as to perform skillfully" (p. 13).

The processes of reflective practice can take many forms, such as action research and journaling; it can be a self-directed activity involving the enhancement of work-related knowledge (Minott, 2010). Teacher standards often include being a reflective practitioner among the expectations for effective educators (Irvin & Daniels, 2002). In their discussion about strategies that can help novice English teachers transition from college student to teacher, Shoffner and her colleagues (2010) characterized reflection as a "conscious interrogation ... a means to productively engage the many challenges they face in the first year" (p. 70). Experienced teachers can also benefit from reflective practice. Gaining "new comprehension" about what to teach and how to teach it (Shulman, 1987). Borko and Livingston (1989) explain that pedagogical reasoning is critical in thinking about "teaching as a complex cognitive skill" (p. 474). As a form of pedagogical reasoning, reflective practice is inextricably linked to effective practice (Borko & Livingston, 1989).

It is useful to look at the objectives of the *Learning by Design* project alongside Shulman's model. As Table 8.1 illustrates, the L-by-D tools are a way to

Table 8.1 *Learning by Design* objectives and Shulman's model of pedagogical reasoning and action

<i>Learning by Design</i> objectives	Shulman's model of pedagogical reasoning and action
Develop teachers' capacities in instructional design and documentation of pedagogy Engage teachers as reflective practitioners	Transformation: preparation, representation, selection, adaptation and tailoring to student characteristics. Reflection: Reviewing, reconstructing, re-enacting and critically analyzing one's own and the class's performance and grounding explanations in evidence. Evaluation: Evaluating one's own performance and adjusting for experiences.

(continued)

Table 8.1 Continued

<i>Learning by Design</i> objectives	Shulman's model of pedagogical reasoning and action
Cater more effectively to learner diversity	Transformation: Adaptation and tailoring to student characteristics.
Provide more effective and explicit articulation of generic standards with learning design customized to specific learner needs	Comprehension: Of purposes, subject matter structures, ideas within and outside the discipline.
Encourage teachers to adopt a knowledge management approach to documenting and sharing best practices	
Redraft Learning Modules for reuse	New Comprehensions: Of purposes, subject matter, students, teaching, and self. Consolidation of new understandings and learning from experience.
Facilitate tracking of teacher and learner inputs, making explicit links between teachers input and learner performance	

operationalize Shulman's model within a web 2.0 context. Going through the process of the initial mapping out of the lesson using the knowledge processes on the placemat, through documenting the lesson, then teaching, revising and sharing the lesson gives the teacher an opportunity to embody the sections of the pedagogical reasoning and action model.

Guiding questions

The questions that guided this study were focused primarily on the teachers' perceptions of utilizing L-by-D and its impact on themselves as educators. Additionally, interviews reflected teachers' thoughts about collaboration with their peers and the students' responses to the Learning Elements used in their classrooms.

The teachers and the interviews

Teachers were recruited from among approximately 20 L-by-D teachers in Australia, the US and Greece. Seven teachers agreed to participate in this study. These educators had used L-by-D for time periods ranging from less than one year to being among the inaugural teachers to use it in previous iterations. All of the participants were classroom teachers, although two held administrative positions at the time of their interview, serving as

Table 8.2 Interview participants' pseudonym, role and country

Participant	Role	Country
Sarah	K-12 teacher	USA
Norma	Teacher	Australia
Dee	Literacy Field Officer	Australia
Beth	Teacher	Australia
Andrew	K-12 teacher	USA
Ann	Administrator	Greece
Grace ^a	Administrator – Deputy Principal of four feeder elementary schools and one middle/secondary school	Australia
Helen ^b	Teacher-coach and mentor teachers pre-K through elementary	Australia

Note: ^aGrace's school was the L-by-D pilot site

^bHelen engaged in "cognitive coaching" (Costa & Garmston, 1994, 2002) to help novice teachers learn instructional design, lesson planning and L-by-D.

coaches to other teachers and professional development specialists. These two individuals' responsibilities included training teachers to use L-by-D and providing feedback on their Learning Modules. Interviews took place via phone and Skype and lasted approximately one hour. The participants' pseudonym, role and country are displayed in Table 8.2.

Findings

Six thematic areas emerged from teachers' interviews.

- Student Behavior and Student Engagement
- Student Response and Impact on Students
- Reflective Practice and Professional Development
- Teachers' Learning Curve
- Collaboration with Other Teachers and Professional Support
- Parents

Overall, the responses revealed that the teachers considered Learning-by-Design to be a useful process that afforded them a way to challenge and engage their students and to reflect on their practice. Teachers expressed that a critical component of L-by-D was the ability to collaborate with their peers and the larger community of teachers beyond their building or district. This collaborative process *was* a way of thinking.

The next sections summarize each theme and include interview quotes to illustrate the participants' perspectives.

Theme – student behavior and student engagement

By creating the quality curriculum through it, we've managed to, I think, get rid of a lot of behavioral problems because the students are engaged – *Grace*.

The elementary teachers mentioned student behavior in the classroom. That is, student misbehavior was a barrier to high quality teaching and learning. Not surprisingly, participants noted the inverse relationship between misbehavior and engagement: as engagement in learning increased, misbehavior decreased, suggesting that these two conditions (i.e., off-task behavior and engagement in the lesson) usually do not occur simultaneously. For example, when student off-task behavior or misbehavior was mentioned, the use of curriculum planning with L-by-D was related as a way to forestall these issues.

Just prior to participating in this interview, Helen had been working with a teacher in her district and had recently completed four classroom observations. The teacher was frustrated that some students were off-task (e.g., playing with their phones under the desk, reading an unrelated book, etc.). Helen summarized the class in this way:

Not really disruptive, just not focusing on what they were supposed to be doing. We (the teacher and I) started thinking about tools in a learning design to address these behaviors. – *Helen*

Helen and Grace found that creating and implementing Learning Modules is a way to support new teachers pre-emptively with classroom management prior to the onset of off-task behaviors. Grace remarked that due to the geographic location of their school, they get a lot of new career teachers in their first position out of college. Therefore, support for new teachers is a highly salient matter in her school. Grace humorously expressed her understanding of the novice teachers' plight in the following comment:

I can certainly empathize with the feeling of OHMYGOSH! I need them quiet. I need them sitting. I need them *sedated*. If I turn my back, they are going to attack! You are thinking about *managing* and *controlling* instead of activities that are focused and engaged ... [you want it so] they are so engrossed in the process, they don't have time to be off task. – *Grace*

These comments suggest that they perceived off-task behavior as a *symptom* of a larger issue: lack of student engagement in the learning process. They indicated that these matters could be addressed (at least partly) through instructional design with L-by-D.

Theme – student response and impact on students

Apart from discipline and behavior issues, the interview participants talked about other ways in which their students were impacted by their use of L-by-D. These comments by Grace and Beth explain their thoughts about ways in which the students' expectations have been shaped by the type of classroom experiences they have, particularly contrasting the 5–6 year-olds with the adolescents.

These young children, given that they are at the very beginning, this is all they have known. This is what they see that learning is. It's working with your peers and talking with your peers ... And the students see that this is part of what learning *looks* like and what learning *sounds* like and engaging in discussions and all of that substantive communication to get at ideas. This is what learning *is* to them. – *Grace*

15–16 year olds ... it's a lovely age where they just start to think and open up. But if they know they don't have that engagement, and they know it's rubbish, they will destroy it. They won't take rubbish. – *Beth*

The teens Beth referred to have grown accustomed to the L-by-D organization and had come to expect high quality lessons in which they have an active role.

Another concept that emerged from the interviews was student empowerment. The teachers characterized *student agency* as a positive outcome of and a benefit for their learning.

Students feel 'empowered' to give that feedback to their teacher. They can see how that feedback and their experiences in the trenches of the choral ensemble have actually made me change the unit differently, so the idea that they (students) are actively a part of the knowledge creation process. – *Andrew*

(The student response) has been really good. Every unit is a Learning Element [the term previously used for L-by-D Learning Modules]. We've had a couple of teachers who had tried some stuff and our kids just didn't respond. The LBD gives students a lot of learning agency and a lot of questioning. While you're leading and teaching, they are also controlling their learning, rather than being passive recipients of information. Their background information is accessed and the teacher is expressing that this background knowledge is inherently valuable. – *Beth*

Sarah commented that her students eventually responded well to the lesson. At first, "they were confused by the formatting of the Learning Element [now 'Learning Module']. I don't usually scaffold lessons that way so it was

unfamiliar.” She believed that would be overcome as the students adjusted to the Learning Module and that the result was “worth it.”

I think it is really important for students to understand why and how the lesson was developed ... what they are trying to accomplish ... the purpose. – *Sarah*

[Students] have some agency over what’s happening with the learning. They contribute what they already know to the learning. They support other students in their understanding, all of that affords buy-in from the students. I think that’s a key factor.... They know what they have to do to do well in that task so there’s no hidden ‘guess what’s in my mind’ type stuff. – *Dee*

Theme – reflective practice and professional development

It’s important to develop a meta-language around what is important in teaching and learning ... to map out what is quality teaching and learning. – *Grace*

The interview participants related ways in which L-by-D was instrumental in their thinking about their practice and, what Irwin and Daniels (2002) referred to as “looking back with the goal of moving forward” (p. 54). The interviewees also described informal and formal professional development related to gaining expertise utilizing L-by-D. The comments suggested that both novice and experienced teachers engaged in reflective teaching as a strategy to facilitate their professional development and “recall, consider, and evaluate their teaching experiences as a means of improving future ones” (Minott, 2007, p. 1). In her role as a teacher-coach and mentor, Helen provides ongoing professional development in her district. She referred to utilizing L-by-D, particularly with novice teachers. Starting with the placemat, she demonstrates for them how they begin with a text and then think through the pedagogical process.

For beginning teachers I will provide a model of a placemat from which I have documented. I will teach them one first so they can see how one is scaffolded through the knowledge process. They would choose a text they would like to document on the placemat and I will use prompting questions to help them document their thinking. – *Helen*

The interview participants whose roles involved coaching and mentoring stated that L-by-D was introduced to all new teachers (novice and experienced) when starting at their schools.

Teachers now don’t think in any other way. When they get a book, they have a placemat and document all of the learning experiences.

They got to a point when subconsciously this is the way you plan. You start off immediately in your head with what do I think the students would bring to this learning experience. How do I get this prior knowledge? – *Grace*

Interview participants were also asked about the role of L-by-D in helping the teachers become more reflective in their work. In response, they noted that using L-by-D forces them to be more deliberate in thinking through a lesson/unit. It also gives them a space to implement instructional ideas that they have.

So what I did was I took a unit of work that I had already planned using Bloom's [taxonomy] and I rewrote that using the four knowledge processes. Then over about 18 months, I kept rewriting it ... as I learned more about the four knowledge processes, the theory behind it, my understanding deepened. So I would line up more things into the plan. " – *Dee*

The nature of *Learning by Design* in which the "create-teach-evaluate-revise" process along with the collaborative aspects in which teachers work together and share their Learning Modules, is structured to prompt reflection and is inherently developmental. The following comments by Andrew and Grace capture this perspective; that L-by-D facilitates teachers' thinking differently about how they approach instructional design, lesson planning and teaching.

Learn-by-Design really opened my eyes. I think it goes with having a greater and broader perspective of how the lessons are integrated. Thinking much more holistically about the Learning Element. It really kind of changed the traditional performance model ... and changed it to a learning experience over multiple weeks. – *Andrew*

... when we saw our first Learning Elements [now 'Learning Modules'] ... they were terrible, when we looked back. Things we documented last year, we made better. It is the nature of what we do, I think. There was this real big breakthrough! What are the teaching tips that would make this learning on the learner side effective? And when we did that, we got rid of the repetition. We started to see much more sharable learning elements because there was all this support. – *Grace*

I think the placemat and all the preparation that goes into thinking holistically made me realize that ... yes, students can perform with background and perform with knowledge, they are not *just* performing. Now, for every concert I've had some sort of Learning Element [Module] I've been using ever since. – *Andrew*

Statements such as this by Andrew highlight his pedagogical reasoning process by reflecting on teaching choral music:

I think we get caught in the trap of what happens after the performance and then all of a sudden we move on to new music. To do what? To perform. And the fact that there is very little continuity sometimes in the curriculum in that while they say we're developing these other skills. Are we really? I think *Learning by Design* has challenged me to actually plan more carefully and to be courageous enough to think about all those connections along the way and to think in broad and bigger schemes. – *Andrew*

As part of this reflective process involving the evaluation of the teaching and learning experience, these “looking back to improve” moments are evident.

[L-by-D] helped me to strengthen my philosophy as far as the importance of sharing with them [the students] that information. Having all of the steps of an assignment available to them so they can look at exactly what we were talking about. – *Sarah*

Because it was part of their everyday teaching and their action research, they could see the purpose of it and were able to reflect on each placemat at the end of that teaching episode as well. That sorta [sic] gave the instant feedback as to why we document the learning this way and reflecting on what success it has for their students ... It's changed their thinking every time they get to a concept. This is the thought process that I go through for the planning and I think that is a huge thing for our teachers. – *Helen*

Theme – teachers' learning curve

Experienced users consistently pointed to the ways in which the Knowledge Processes, the placemat and the web planner have been incorporated into their experience as educators. Their comments suggested a high level of investment in the project. However, several interviewees pointed out the initial learning curve in being able to effectively use the planning tool:

Initially it is confusing, but once you get your head around it, it's really simple ... It felt like a slow process, but looking back, it was probably quite quick. I think the thing we always say is that we don't try to write the units alone, when using the learning by design, it's really a collaborative tool, we need to have more than one person's idea to make it really work. – *Beth*

Grace also talked about the time investment needed to develop the Learning Elements and adjust to using the web planner.

I think the first thing is that it takes longer ... and teachers are time poor, so that was the first challenge. – *Grace*

Ann, who was in Greece, reported that she received good feedback about teachers using L-by-D, although she also referenced the amount of time needed to learn to use the web planner. She went on to explain that the teachers receive training and support so they develop competence in creating and publishing Learning Modules themselves.

At the beginning, they were skeptical because of the time – it's a time-consuming process. We always support them and provide all the necessary information so basically if they get the help they need, they're more than able to do it. – *Ann*

Dee and Helen reiterated this conclusion as well:

The drawback I think is that it's time-consuming. I think working with the online web-based environment, I think because you can't see everything in front of you at once, you can only work in one section at a time, I find that frustrating. However, younger generations may find it just typical, a typical work environment. – *Dee*

Mainly the knowing of how to navigate and use the tools. Originally people forgot to click update. So when some people say it takes a long time to document the learning on there, what we found was that we always document on placemats first. – *Helen*

However, collaboration with other teachers was discussed both as a means to address the learning curve issue and as a way to facilitate developing high quality Learning Modules. Working together helped minimize the time aspect of the process.

And we've kinda [sic] overcome that. We always design collaboratively, so there's a few people working on a learning Element [Module], so we make sure we are sharing those across the school. – *Grace*

We meet as groups of two or three, sometimes four ... We find where gaps are. We brainstorm again, and once we have a really good skeleton, we say 'this is the teaching strategy, this is how we do it, these are the recourses, this is the template,' that sort of stuff. Yes, we always use the placemat. That way we know the design process works. – *Beth*

The next section addresses the theme of Collaboration and Professional Support more directly.

Theme – collaboration with other teachers and professional support

Working together and receiving guidance when needed – we know that these strategies are critical for students and professional educators alike. Collaboration and professional support were addressed in several of the interviews when the participants discussed strategies that helped them learn to use L-by-D effectively. Additionally, the collaborative process was not limited to teachers in the same school or district. Ann, who was in Greece, talked about a peer-to-peer learning activity in history, in which the students worked with students in Australia. Sarah was the only teacher who indicated that she experienced considerable challenges using L-by-D. She explained this was primarily because she was not able to use the web planner at home and she was the sole user at her school.

I could not get it to work on my home computers. It worked OK at school. The computer and browsers at home were too old. That was frustrating. – *Sarah*

I didn't work with any teachers at my school. I sent my Learning Element [Module] to teachers in Australia and got feedback. It would be helpful to have another teacher working on it at the same time. – *Sarah*

Sarah did not have the benefit of using L-by-D as a member of a cohort of graduate students (like Andrew) or with colleagues in the building/district (like the Australian teachers). She expressed no plans to continue using L-by-D beyond that semester, explaining that her home computer could not run the L-by-D application. Sarah received extensive technical support and she expressed that, although this was helpful, she was never able to reliably run the application from home and save her Learning Modules. Consequently, Sarah developed her Learning Modules using her school computer, but this precluded her from working on them in the evenings and weekends when she did much of her preparation. In this relative isolation, it is not surprising that Sarah indicated no plans to continue utilizing L-by-D. Sarah's experience contrasted sharply with what Grace portrays as the L-by-D *culture* of her schools:

We are at the stage now where this is what our schools do, so if you come into one of those three schools [to teach], the understanding is that we develop curriculum at our schools in this way. [Teachers] will work in teams with more experienced people. There is this collaborative support from peers, from their executive teachers and coaches and from me as well. We have all of these support mechanisms to show that this is what

we do. But that doesn't mean everyone does it. In high schools, we see the ups and downs but I think we are on the up again in math and science. A few teachers will say, 'when I use it, the learning is so much better and the kids are so much better.' – *Grace*

The “ups and downs” Grace referred to are important to mention because they explain that, although peer and administrative support appear to be important factors in utilizing L-by-D effectively, the process was not universally embraced by all teachers, even within schools with strong collaborative networks. Beth and Dee relayed instances in which teachers at their school expressed less enthusiasm for using L-by-D:

We have quite a few older, resistant teachers who get a little bit overwhelmed by the new technology. They get flustered. They are OK with Word. Getting a placemat, they are comfortable doing that, which means there is consistency across our school with the design process. – *Beth*

Initially, when we tried to introduce this in numeracy and mathematics, there were people who did not want to take it on. That was not this year but last year, a bit of a challenge at this school. They ... did not see the value of it in numeracy. In mathematics, the teachers in the upper grades use it pretty consistently. – *Dee*

Professional support involved peer-to-peer collaborations, informal modeling and training, and formal presentations followed by hands-on practice. Several interviewees commented on the significance of working together with other teachers in the school:

We have a number of teachers at this school who know how to do that well and who can model it for other people. I know it is really convenient if you have the same people in your building ... I think the reason it's been so successful in art and technology is that it's a whole school move so they know they have that support. We don't just work in our area; we work to support across the school. – *Beth*

You have to work with other people, work with other staff to look at and see how it works. It really is a collaborative tool. – *Grace*

... we have teachers having their planning time in pairs to encourage collaboration and we try to get a new teacher or less experienced teacher with a continuing teacher or more experienced teacher. They get ongoing planning support when they first come. – *Dee*

As Grace noted during her interview, “teachers are time-poor” and she validated their concerns regarding not only the learning curve but also, the time it takes to develop a Learning Module. She characterized the time involved

in these efforts as a worthwhile “investment” – using L-by-D actually saved them time overall in the planning process.

This level of detail that supports the classroom learning is not what is typical in curriculum documentation. What our teachers have found is that if I invest all of this time in the curriculum stage, all my work is done. I don't have to then change that curriculum language into the classroom. And the teachers see that ... it will actually cut down your day-to-day work because you can just follow the design. And of course you can change it. You're not locked in. – *Grace*

Parents

Although parents' perceptions of the effects of L-by-D were not initially considered as a direct effect in this study, two teachers offered their observations about parents' responses. Specifically, they talked about the parents' perception of positive outcomes associated with the lessons/modules designed. Grace commented that:

... There is so much more looking at the pastoral care side of our students, the expectations of parents, you have to manage all of that. – *Grace*

In noting the support and validation from parents, Andrew and Beth captured the notion that parents notice a difference in what their child is learning. Having the parents' buy-in provides important support for the teaching and learning process.

I think the other thing that comes out of it is parent feedback and parents understanding that [their] child is investing in curricular time in music instead of maybe another academic area ... now they see in concerts the unbelievable wealth of knowledge they are gaining not just in music but interdisciplinary knowledge. – *Andrew*

Now because we are engaging the students in a way the parents are also engaged ... I think it is sort of changing those parents' minds. I think they see the positive impact on the student so we must be doing something right. Parents are the ones we need on board. – *Beth*

A parent who also happened to be a teacher visited her daughter's class and expressed her positive response to seeing Learning Elements implemented in the classroom:

We have an open door policy where parents are invited to come in and share in the learning and support students in their learning. This term, she was 'blown away' by the quality and the deep learning that was

happening at the kindy level ... That was an endorsement. [She said] 'As a professional educator, I'm impressed.' – Grace

The parents' response to the learning outcomes was unanticipated yet positive information to receive. They may not know about L-by-D specifically as a knowledge management system, but the parents mentioned in these quotes expressed an awareness of and an appreciation for the impact on their children's learning.

Conclusion

As mostly experienced users, these teachers strongly endorsed *Learning by Design*. One drawback that was noted was that there is a learning curve associated with L-by-D, in that it can be hard to learn at the beginning. This was not, however, a significant deterrent as these teachers considered the time spent learning to use Learning-by-Design as an "investment" that yielded considerable dividends for their students (improved learning outcomes, on-task behavior, increased engagement, etc.) and themselves (time saved, reflective practice, collaboration, improved planning and instruction, etc.).

These interviews affirmed that teaching (lesson planning, instructional design) consists of a set of complex skills (Borko & Livingston, 1989) including ways of knowing and doing. L-by-D appears to foster the development of these skills because the application allows for the teacher to use multimedia, document their work, collaborate with peers, share the Learning Module with peers, and revise and re-teach the Learning Module. This process contributes to pedagogical reasoning and reflective practice for both novice and expert teachers.

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9

The *Learning by Design* Framework in School and Out-of-School Contexts: Research Experiences and Perspectives

Pierpaolo Limone and Rosaria Pace

This chapter describes research and field experiences related to the Learning by Design framework in the Italian educational context, crossing formal (school and university) and informal (out-of-school) settings. In the last five years the Educational Research and Interaction Design (ERID) Lab team of the University of Foggia adopted the Learning by Design model for instructional design activities in school settings and within informal contexts, also using the framework as a design tool. An overview of the framework adoption is outlined in the following pages, describing the Learning by Design application for instructional design planning, for collecting users' suggestions and developing co-designed activities. The paper represents a global reflection on the importance of the design process in which the learning paths and materials are co-constructed with the stakeholders. Ideally, this process should be iterative and pervasive throughout the learning experience, crossing the space and time of school and out-of-school contexts.

Introduction

One of the trends we observe in today's rapidly changing social and educational environment is the growing importance of the educational resources design and lesson planning, both for the co-operative organization of learning activities and materials development. Digital platforms and precise models for educational planning help teachers and students to learn, collaborate, build, consolidate existing knowledge, reflect on the concepts and processes, and activate metacognition. The *Learning by Design* framework is both a conceptual framework and a concrete tool that enhances capacities to create new knowledge. It also represents a model of contemporary knowledge that answers the need for lesson planning in the era of digital and complex learning environments.

The Educational Research and Interaction Design Laboratory (ERID Lab) team at the University of Foggia has adopted the *Learning by Design* model

for instructional design activities in formal and informal settings, also using the framework as a design tool, to support the collection of users' experiences as an integral aspect of educational product design.

This chapter describes research and field experiences related to the *Learning by Design* framework in the Italian educational context, crossing formal and informal learning environments. An overview of the framework adoption is outlined in the section "*Learning by Design* as a tool to foster learning in different contexts", describing the *Learning by Design* application both for instructional design and for educational product development. The section titled "*Learning by Design* in instructional design context" presents the results of research that focuses on the *Learning by Design* framework in an instructional design context, both for instructional design planning through the Cl@ssi 2.0 case and the MediaEvo case, and for combining in-school and out-of-school activities through an educational farm project. The section titled "*Learning by Design* in the product design context" describes the *Learning by Design* framework in a product design context by presenting two design experiences: a visit to a museum through smartphones and the development of a social network for the school context. Based on these collected experiences, there is an overall reflection about teaching and learning activities as a part of the design process in which the learning paths and materials are co-constructed with the stakeholders. Finally, the last section focuses on concluding remarks.

***Learning by Design* as a tool to foster learning in different contexts**

For the last five years the ERID Lab has been employing the *Learning by Design* framework in order to carry out research and to conduct pedagogical activities in different learning settings. These activities allowed us to describe diverse experiences involving teachers and students in unusual roles such as, for example, informants or design partners (Druin, 1999, 2002). Additionally, we investigated the application of the framework for instructional design, learning resource development, for planning of curriculum pathways, and digital learning environments (Table 9.1).

Alongside the introduction of digital technologies the flow of the "lesson" is fragmented into units of content, according to themes and pathways of micro-learning. *Learning by Design* allows the breakdown of the educational process into micro-blocks.

Table 9.1 *Learning by Design* applications

Learning Focus	<i>Learning by Design</i> applications
Instructional design	<i>Learning by Design</i> as a tool for instructional design planning and as a framework for mixing in-school and out-of-school activities.
Product design	<i>Learning by Design</i> as a design tool to collect user's suggestions and to develop co-design activities and educational products.

As a consequence, summative assessment, with a final test at the end of the learning path, shows all the limitations and inadequacies frequently noted in the past (Black & Wiliam, 1998; Biggs, 2003). Employing *Learning by Design*, the teaching actions become modular and deconstructed in time and space. Therefore, in order to extend these actions beyond the classroom and over time, they require peer feedback, recursive actions between learners and learner activities, and a gradual process of curriculum re-design. Each step of the project can be evaluated and these can be shared, re-designed, and re-implemented.

Our use of the *Learning by Design* framework reflects our understanding of the importance we place on context and on customized solutions, within a perspective of situated learning. The customization of each element of the educational plan is one of the most powerful elements of the *Learning by Design* approach. This customization allows processes, objectives and learning outcomes to be adapted to each learner bearing in mind his/her personal history, prior knowledge and needs in terms of learning outcomes.

Finally, this approach fulfils our need to adopt processes that document the learning path. The use of digital media and platforms in which students can build texts, insert resources and visualize works, allows teachers to reflect on their teaching and learning practice, while students can actively contribute to constructing the learning path. One example of this digital medium is the *Scholar* platform, used to support the *Learning by Design* steps. This digital environment represents a meeting place and a physical and virtual collaborative space for building and sharing knowledge, on the basis of feedback and interaction between teachers and students, and among peers.

The introduction of *Learning by Design* in the Italian context is particularly relevant since schools are facing a period of profound change. The new role of textbooks (Eisenstein, 2005; Barbieri, 2011; Limone, 2012b), the introduction of technology in the classroom, and rethinking of the structure of the lesson are interdependent phenomena, which also relate to a rethinking of teaching methodology. Consequently, the focus on the compositional dimension - hence the opportunity for student-directed writing - and the possibility of renegotiating stages and processes adapted to the context and the student, are features that have enabled the use of the framework in some Italian schools.

In particular, the experiences that will be described in the next section have in common three recurring elements: the selection of blended learning methodologies with the use of digital tools and multiple semiotic resources; a rethinking of the role of teachers; and the importance of collaboration among all stakeholders involved in the process of educational innovation.

The first element, the selection of blended learning methodologies with the use of digital tools and multiple semiotic resources, is a direct consequence of the adoption of the digital language, of web and online resources, which have diversified and enhanced communication possibilities and multimodal expressions (Kress, 2003, 2010; Bearne, 2005). Today there is a proliferation of languages as well as strategies and environments that can

scaffold learning processes. This diversity is, however, effectively applied only through the integration of models that respond to the needs and communication styles of today's students. The planning of teaching actions cannot be separated from the selection of methodologies and tools that, while respecting the delicate balance between *in situ* and online activities, help to make the training process effective, interesting and motivating for students.

Second, in rethinking of the role of teachers, they are considered the real designers of learning experiences (Kalantzis & Cope, 2010, 2012; Laurillard, 2012). This activity as learning planner becomes more and more explicit in all educational stages, linking inside and outside the classroom activities and materials.

The collaboration of all stakeholders involved in the processes of educational innovation is the third recurring element in our research experiences. During all the learning projects described, the processes of innovation were developed with the joint action of different actors, such as researchers, teachers, students and developers of digital products.

These educational experiences provided important suggestions for the rethinking of the models and practices related to school education. In particular, they fostered reflection about the implementation of learning resources, the need for teacher training, both focusing on technological literacy and on methodological expertise, and the importance of cooperation during all stages of the educational process. The two following sections describe these educational experiences employing *Learning by Design* in the instructional design context and in the product design context.

***Learning by Design* in instructional design context**

This section discusses the use of the *Learning by Design* approach for instructional design planning by presenting two projects: the Cl@ssi 2.0 case and the MediaEvo case.

The use of the *Learning by Design* framework within instructional design processes involved a focus on lesson planning. In particular, it was used as a tool for the design of learning activities (learning plan level) and as a tool for reflection on the educational planning itself (meta-level), as described below.

The Cl@ssi 2.0 case

The project Cl@ssi2.0, within the national "Digital School" plan, commenced in 2009 and was funded by the Italian Ministry of Education, University and Research. It focused on the introduction of teaching and learning innovation in school education, through a bottom-up process, asking for innovative projects and proposals coming from schools themselves and involving ICTs. The pilot phase of the project was addressed to 156 secondary schools and was later extended to primary and high schools.

During the first stage of the project, as part of this national initiative, our research group presented *Learning by Design* as a possible strategy to rethink

the structure of the lessons and their extension beyond the classroom through a widespread and pervasive use of the technologies and through a new pedagogical model for learning design.

Some teachers of selected classrooms worked with the researchers in a short training session on *Learning by Design*, combining the theoretical scenario and some examples (from Kalantzis & Cope, 2005; Neville, 2008; Yelland et al., 2008). Afterwards, workshop activities were held focusing on classroom practice in order to share the model among teachers and to adapt it to individual school contexts.

The *Learning by Design* framework was adopted in some of those schools as a scaffolding tool for the instructional design process. In particular, it was employed as methodological support in order to design learning activities. Table 9.2 is an outline of its implementation for the Cl@ssi 2.0 project.

The teachers adopted the framework as a design model, using it as a guide to plan, organize and conduct educational activities enriched with digital learning environments and settings, different semiotic resources, partnerships with colleagues and extra-school actors, digital learning materials and assessment tools.

The use of the framework during the school year led to important and unexpected results: the introduction of varied teaching methods, also combined during everyday learning activity; the students/teachers authorship of multimedia materials and learning resources; a renewed attention for the learning planning; and, in some cases, the redesign of the educational setting.

Table 9.2 Cl@ssi 2.0 project and *Learning by Design* use

***Learning by Design* for lesson planning**

Aims of the experience

Introducing new technologies and teaching-learning methodologies in the classroom.

Learning objectives (for teachers):

- Designing and implementing innovative educational experiences through the *Learning by Design* approach
- Learning how to plan learning paths including ICTs

Users involved

School teachers in five Apulia classrooms

Activities implemented:

- Needs analysis with a focus on innovative teaching practices
- Training of teachers about digital tools and the *Learning by Design* framework
- Monitoring of the learning project design

Added value of the introduction of *Learning by Design*

Learning by Design allows teachers to rethink the times, the activities and the tools used in the classroom. In this way lesson planning, but also the type of resources and the assessment processes are profoundly modified in theory and in practice.

The MediaEvo case

MediaEvo was a three years' research project financed by Apulia Region that concluded in 2011. It aimed to introduce new media for teaching and learning medieval history in secondary schools.

The MediaEvo project was designed and carried out with the aim of innovating the teaching of medieval history through the creation of a prototype of a digital platform (Pace, 2011). In particular, among the main results of the project, it is useful to mention the development of a transmedia learning environment (according to the features detected by Jenkins, 2003; Rodríguez Illera, 2012) built to disseminate the learning resources, using different tools: an educational videogame; a website; the school textbook; and local events (historical parades, exhibitions, for example).

The project involved about 100 students, who explored concepts related to medieval history in different forms and pathways, thereby activating some innovative processes, such as: integration of different media during the exploration of facts and events; reversing of the learning logic according to a flipped classroom dynamic; involvement from the planning stage of the learning path; choosing varied resources, online and offline; and assessing student performance over the whole learning process, not only for the final performance.

The work with the *Learning by Design* model was extended to students and to the actual work within classrooms, as described in Table 9.3.

Table 9.3 The MediaEvo project and *Learning by Design* use

***Learning by Design* for school learning**
Aims of the project

Innovating the teaching and learning processes for Medieval history

Learning objectives (for students):¹

- To know and use a specific disciplinary language
- To select different learning sources
- To find out medieval historical roots in life context
- To research, discuss and organize content on medieval history

Users involved

About 100 students of 10–11 years of age

Activities/outcomes:

- Multimedia glossary with key terms of the historical period
- Scenario: medieval daily life in the Castle
- Middle Ages newspaper: timeline with core events of the historical period
- Comics focused on medieval characters: the monk, the scribe, the knight

Added value of the introduction of *Learning by Design*:

Learning by Design in this case was used as a teaching method. A website created for the project was also used, serving as a resource able to host teaching materials, and providing spaces for communication (chats, forums), rubrics, texts written in a collaborative way.

A unique feature of the learning experience was also the distribution of teaching and learning activities and materials on a dedicated platform. In particular, some learning activities were built on the model of *Learning by Design*, structuring them into a blended learning environment, with classroom lectures, workshops and online activities. Teachers and the research group developed some educational activities according to the model of *Learning by Design*, sharing them with students (Figure 9.1).

At the end of the learning path, students were able to discover signs of the medieval past in the city, to recognize and use terms and concepts related to the historical period, to explain, even in complex textual forms (digital storytelling, comics, short audio-visual products) the basic concepts and events of that time, to produce multimedia texts, also using out-of-school resources.

Particularly interesting for our research activity was to support teachers in instructional design and everyday activities with the integration of technological tools supporting specific learning processes. With this aim we adopted the media forms described in the Conversational Framework (Laurillard, 2012), as shown in Table 9.4.

The design path included the following steps: (1) analysis of training needs of students and definition of the educational objectives; (2) selection of learning processes, activities and methodologies best suited to the context of activities (strategies and teaching methodologies, media activities, tools and timing for assessment); (3) detection of available resources (technological equipment, time, skills of teachers, institutional and inter-institutional collaboration); and (4) overall definition and general characteristics of the educational intervention.



Figure 9.1 A screenshot of the MediaEvo website: community

Table 9.4 Example from a fragment of learning planning

Definition of learning objectives	<i>Application objective:</i> to develop the basic concepts of the discipline in complex textual forms
Selection of the knowledge processes	<i>Applying creatively:</i> writing a digital story on the Crusades
Identification of learning activities	<i>Production</i> of a digital story on the Crusades <i>Collaboration</i> in the creation of the tale
Selection of media forms	<i>Narrative:</i> text, music, image, etc. <i>Communicative:</i> wiki, foruk, chat, community, etc. <i>Productive:</i> software for video and audio editing, etc.
Definition of assessment tools	<i>Rubric for the assessment</i> of digital stories

Source: Adapted from Limone, 2012a, p. 138.

The choice of the knowledge processes followed the selection of the *Learning by Design* knowledge processes (Kalantzis & Cope, 2005). The teachers-designers could then structure their pedagogical intervention considering a wide range of processes activated through learning activities: acquisition, inquiry, practice, production, discussion and collaboration, and the support of narratives, interactive, communicative, adaptive and productive media forms (Laurillard, 2012). Thus, it was possible to enhance the educational affordances of each tool and instrument used in the classroom (books, websites, images, simulations, wiki, and so on) for specific actions (reading, answering questions, collecting data, achievement analyzing, doing science experiments, etc.).

The design phase ended with the selection of assessment strategies, including: self-assessment, peer review, questionnaires, writing tasks, and observation grids.

Throughout the experience, teachers appreciated the framework and its scaffolding role for the introduction of innovative learning processes. Students, on the other hand, reached important outcomes related to the use of media languages and the ability to self-organize learning activities; the capability to work in teams solving real problems; the skills to access educational content through different tools (such as computers, tablets, smartphones); the ability to manage peer learning and peer assessment actions.

The educational farm case

We also used *Learning by Design* as a bridge between the classroom and real life, between learning in school and that occurring in the real world beyond school. Here we present an educational farm setting in which rich and interactive learning pathways were planned and made with on-site or digital resources. Educational farms are agricultural structures devoted to activities related to the cultivation, harvesting and transformation of local

food products; they are also a center of information and educational services that welcomes school groups and adult visitors, also offering pathways and learning activities to acquire knowledge of typical local products.²

It was the aim of the project to provide processes and activities that could be shared by learners in the scenario of an open and extended learning environment. The teaching experience involved the design of learning pathways within an educational farm. The resources were both physically present *in situ* and collected online, on the farm website. In this way, real and digital materials enabled the creation of a rich and complex ecosystem. This educational experience has enabled the application of *Learning by Design* to engage practical and experiential knowledge, linking curricular and extra-school activities (Amos & Reiss, 2006; Braund & Reiss, 2006; Dillon et al., 2006), according to the information described in Table 9.5.

The distinguishing features of this learning experience include:

- Planning of the learning process for micro-activities, with the possibility of selecting different and personalized pathways.
- Abolition of the difference between before/during/after the visit: continuous and integrated actions allow students to tap into the resources of the educational farm in the school context and within the spaces of the farm itself.
- Integration of situated learning with ubiquitous access to educational resources.
- Use of the farm and its website as a hub connecting learning resources and educational options.

Table 9.5 The educational farm project and *Learning by Design* use

***Learning by Design* linking formal and informal learning**

Aims of the project

To link the school and out-of school learning processes focusing on the phenomenon of food waste and to the agri-food local identity.

Learning objectives (for adult and youth learners):

- To learn the elements of nutrition
- To analyze the food waste phenomenon
- To know products' seasonality and animal and plant biodiversity
- To learn about the nutritional and health qualities of local production
- To discover food production linked to the regional area
- To know the transformation processes related to some local products (e.g. olive oil, wine, bread, cheese, etc.)

Users involved

The pilot project does not include the field observation, only the design phase. The target group includes students of schools from different stages, but also farm visitors.

(continued)

Table 9.5 Continued

Learning by Design linking formal and informal learning

Activities planned for the pilot study:

A set of learning paths designed to recognize the phenomenon of food waste, to communicate it, to understand its causes and effects and, finally, to work on its possible solution

Added value of the introduction of *Learning by Design*

Learning by Design has been used as a cross-setting learning tool.

Learning by Design in the product design context

The *Learning by Design* framework has also been used as a tool to detect and collect data, ideas, desires and thoughts of the students, following what Elisabeth Sanders (2002) defines as experience design. Pursuing this line of thought, this section presents two design experiences: a visit to a museum using a smartphone and a social network for a school environment.

Designing a visit to the museum using a smartphone

The second field of application of *Learning by Design* that we will address in this paper is out-of-school hearing. Here we describe and analyze innovation in participatory planning processes with students (Nesset & Large, 2004), in particular the design of a guided tour within a museum using a smartphone.

Children started the learning activity with exploration of a museum, considered as a “teaching unit” and, at the end of the experience, they re-planned the visit on the display of a mobile device (Table 9.6).

The learning experience started with the “experiential tour,” using the technique of Cultural Probes (Gaver et al., 1999), which transformed participants into ethnographers, giving them simple and easy-to-handle instruments for the collection of probes or evidence such as photographs, notes, and drawings. Such materials provided inspirational responses and unexpected ideas which were very useful for developing the design proposal. At the end of the visit, children drew on paper with pencil and pastel colors, and wrote short texts and comments about the most significant elements of the visit to show to their classmates.

In the next phase, children shared the “evidence” of the visit with teachers, they reconstructed their route map within the museum, and together identified relevant themes and objects. Children were also involved in the actual design phase for recreating the museum visit on the phone display, starting from the concept of an interface through a brief interactive lecture. In the following phase, children assembled the elements learned in the previous stages of the educational activity and reinterpreted them critically by answering the following questions: how can mobile technologies support a visit, real or virtual, to the museum? What function could be used to hire

Table 9.6 Design of a visit to the museum using a smartphone

Learning by Design for an interactive museum experience

Aims of the project:

To involve end users in the design of a learning path for smartphone, using *Learning by Design* as a model to guide the learning process.

Users involved

Forty children aged 7-8 years

Activities implemented:

The different stages of the learning pathways were autonomous but interdependent, according to an approach that fostered the progressive appropriation of concepts by children, and then the application of the theoretical elements learned in a realistic assumption of the design for a concrete use of an imagined device (knowing in action). Below are the phases:

- Exploratory visit the museum with the technique of Cultural Probes
- Lectures and interactive presentations: the concept of an interface of a mobile device and the role of the icons on the display
- Scenario: the use of the phone for a museum visit
- Interface design: the mobile phone as a support for the visit, both real or virtual

Added value of the introduction of *Learning by Design*

The knowledge processes of *Learning by Design* guided the research and design process. The users involved were invited to experience the museum in person, to reflect and analyze their own choices and representations, to understand the capabilities of the tools available, and to creatively design new paths and strategies for the museum's educational itineraries.

the phone in a museum? In order to answer these questions, in the last phase of the activity, students became the designers of the interface device that they, their friends and/or family might use to visit a museum.

The *Learning by Design* framework guided the young designers through different contexts (museum, school, design setting), situations and roles (explorers, students, creators), helping them to discover new knowledge and to play a new role as designer (Figure 9.2).

Designing a social network for a school environment

The *Learning by Design* framework has also been used in a design experience involving social networks for the school context, within a Living Lab project called SPLASH "Social Platform for Active Learning and Social Habitat" (Table 9.7). On this occasion, however, the end users were the teachers involved either in training activities about learning innovation or in laboratory activities based on *Learning by Design* as a designing tool.

The experience involved teachers and students in the platform design, during a whole school year work, with researchers and the team of an ICT company (Infor, 2000). During the activity, they reflected on the potential of social learning platforms, attended workshops, designed on-line and on-site



Figure 9.2 Some materials produced by the children after a visit to the museum (conceptualizing)

Table 9.7 Design of educational activities within the platform SPLASH

Design of educational activities within the platform SPLASH

Aims of the project

To design and develop a social learning environment for school, involving the stakeholders and final users.

Users involved

20 secondary school teachers from Apulia region, 20 students

Activities implemented:

- Needs analysis
- Observation of practices of use
- Sharing with all the actors of concrete objectives of innovation
- Platform design
- Adoption of the innovation in the context

Added value of the introduction of *Learning by Design*

The *Learning by Design* Knowledge Processes guided the research and design processes. The users were invited to research, analyze documents and texts, understand the potential of the tools available, and design creative learning paths within the digital learning environment.

learning activities, produced contents and resources to share with colleagues. The platform integration in the school context and the detection of its strengths and weaknesses, opportunities and threats, will be the next step.

Concluding remarks

The varied research experiences described in this chapter share a common ground in their approaches to instructional design and learning resource development. The users become part of a design process while, at the same time, they are active participants in the learning experience. As a result,

the planning stage and the learning activities become intertwined, within a rigorous but open process.

Throughout our experience in varied contexts and situations, the framework has demonstrated that the precise planning of each element of the learning activity can lead to surprising results, such as the inclusion of learning resources from out-of-school environments. It also increased reflection on learning content and methodologies, and encouraged the reorganization of learning actions to address specific needs and situations. Teachers and learners could also become active actors in educational product and process design, following a proper methodology.

The learning activities and the materials designed with the “end users” become an integral part of the learning process when they activate metacognitive and self-reflective processes. The design of teaching resources occupies a central role in our research because the design process provides a plan for students and teachers. Further, design actions themselves constitute a focus for exchanging ideas, gathering of feedback, activating communities of practice, as well as negotiating the elements of innovation within the learning context.

Moreover, *Learning by Design* is a useful resource to reflect on the whole process of educational design – including learning materials, platforms and paths – even if these steps are fragmented in the classroom life. These processes (instructional design, product design, deep interaction) should be recursive, incorporated into a consistent path, encouraging the construction of learning materials, but also the sharing of the educational projects. Ultimately, these processes may facilitate a meaningful communication within and outside the classroom, in order to promote actions of peer learning.

Our experiences in *Learning by Design*, as evidenced in the pilot studies described in this chapter, involve teachers, students, educators, and researchers. All the stakeholders expressed positive feedback in terms of motivation, engagement and interest using the model in everyday educational practice. As teachers and learners, it helps to imagine flexible paths involving and scaffolding creative, critical and analytical processes. This focus on multi-perspective cognitive activity is, in our opinion, a principal strength of the framework.

In the future, we expect to adopt the model in new and extended learning contexts and, above all, to compare the learning results collected in traditional and *Learning by Design* settings. Another strong research interest, moreover, is the comparison of this model with other Italian frameworks, such as the method of *Situated Learning Episodes* (Rivoltella, 2013), in order to establish common or complementary elements and guidelines to scaffold learning processes.

The Italian school and higher education sectors are about to engage in a real revolution: moving from the idea that learning occurs only within the classrooms and planning for lifelong, transformative, open learning could be a good starting point to build real innovation.

Notes

This chapter describes the results of some research and teaching experiences already concluded and implemented. The outcome of this work has been published in other scientific contributions by the authors: Pace & Limone, 2009, 2011; Pace, 2011; Limone & Pace, 2011; Limone, 2012a; Pace, Dipace, di Matteo & Contò, 2014.

This chapter was developed jointly by the authors. Pierpaolo Limone wrote the paragraphs “1. Introduction” and “4. *Learning by Design* in product design context”; Rosaria Pace wrote the paragraphs “2. *Learning by Design* as a tool to foster learning in different contexts”; “3. *Learning by Design* in instructional design context”; and “5. Final remarks.”

1. Learning Objectives derived from Italian secondary school learning programs; media skills chosen according to the Recommendation of the European Parliament and of the Council on key competences for lifelong learning (2006/962/EC), and to the Commission Recommendation on media literacy in the digital environment for a more competitive audiovisual and content industry and an inclusive knowledge society (2009/625/EC).
2. The research experience related to the educational farm has been described in detail in a recent paper entitled “On-site and online learning paths for an educational farm. Pedagogical perspectives for knowledge and social development” (Pace et al., 2014).

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10

Doing Digital Composition on the Social Web: Knowledge Processes in Literacy Learning

Kathy A. Mills

The power to influence others in ever-expanding social networks in the new knowledge economy is tied to capabilities with digital media production. This chapter draws on research in elementary classrooms to examine the repertoires of cross-disciplinary knowledge that literacy learners need to produce innovative digital media via the “social web.” It focuses on the knowledge processes that occur when elementary students engage in multimodal text production with new digital media. It draws on Kalantzis and Cope’s (2008) heuristic for theorizing “Knowledge Processes” in the Learning by Design approach to pedagogy.

In increasingly digitally-dependent societies, reading and writing in personal and public life requires exponential shifts in new knowledge of media, modes, genres, and ways of working with texts which, in turn, has implications for pedagogy and curriculum in education institutions across the life course (Mills & Exley, 2014). As argued elsewhere, writing must be seen “... as inclusive of socially-organised sign-making practices that make use of both print and digital technologies for producing meanings” (Mills & Exley, 2014, p. 2). Digitally encoded reading and writing is increasingly hybridized, involving modified generic structures and combinations of modes. Digital texts online are often interactive, sometimes abbreviated, ubiquitous, and disseminated rapidly to potentially larger audiences than in the past. Reading and writing can be simultaneous, requiring different forms of embodiment, spatiality, and creativity (Mills & Ranker, 2014).

Digital texts, such as microblogs, blogs, or online presentations, can be co-constructed or participatory, and involve distributed expertise of the groups with shared interests (Mills, 2013). Mobile phones, tablets, and other digital devices support literacy practices with accessibility anywhere, and at any time (Leander et al., 2010). On the dark side, data about individuals can be mined, analyzed and redistributed quickly by others, with significant implications for knowledge management, privacy, and policy (Clifton & Marks, 1996).

The implications of the new knowledge economy hold both potentials and risks, but the power of using digital technologies for productive,

meaningful, and critical literacy learning is in the hands of educators. The changing digital environment and the nature of textual practices calls for envisioning the changing constitution of writing practices and learning in schools (Kalantzis & Cope, 2008; Mills & Exley, 2014).

Consider the following student case: Malachi is an Indigenous Australian eight-year old who struggles with writing, and attends school in a low-socio-economic district. He produced a podcast containing the following excerpt after participating in a series of digital media-based literacy lessons involving the production of blogs, web profiles, podcasts, and movies:

This is my first movie. My name is Malachi. The thing I found easy about computers is really everything. The thing I found hard is nothing.

Malachi's statement highlights what practitioners have long known intuitively about the potential of new digital media to engage disadvantaged learners in textual practices (Mills, 2010). Yet what is needed is a systematic way of theorizing, using a coherent framework, the knowledge functions that are actively at work when learners engage in textual practices with digital media. Teachers also need exemplars for the successful integration of pedagogies to support the students' application of knowledge processes in the digital contexts of literacy use.

Drawing data from media-based lessons across several classrooms and schools, this chapter examines the kinds of knowledge that students utilize when they produce digital, multimodal texts in the classroom. The *Learning by Design* framework is used as an analytic tool to theorize how students learn when they engage in a specific domain of learning – digital media production. The students in the research were from low socio-economic, and culturally and linguistically diverse backgrounds, reflecting a fast-growing population in South-East Queensland, Australia.

Experiencing the known and the new

When learners engage in digital media production, they experience or perceive new technological knowledge through personal and sensory engagement with digital tools, such as laptops and cameras, and a broadening array of software applications for specialist media production. This engagement with digital technologies of textual production involves the self, emotions, and immersion in the human and natural world. Like other experiences in the world, this should be conscious, systematic, explicit, and structured.

Kalantzis and Cope (2008) distinguish between two distinct ways of experiencing: experiencing the known, and immersion in new experiences. "Experiencing the known" involves drawing on familiar lifeworld experiences, prior knowledge, community background, personal interests, and cultural resources of learners. Examples include sharing about favorite video

games, brainstorming what students already know about a topic, or using popular multimedia texts in the classroom.

For example, a media teacher–researcher introduced a lesson on blogging to several classes of year four students in a public school situated in a low-socio-economic area. The students were from a range of ethnic backgrounds, including Indigenous Australians, migrants, and economically marginalized Anglo-Australians. Using her laptop connected to the Internet and a data-projector, the media teacher displayed part of the Disney© fan site to show an example of a blog for primary-school age children.

There were sounds of excitement and exclamation from the class as a blog was displayed on the screen – it resonated with their previous experiences of popular, multimedia texts. Students were highly engaged in this phase of the lesson. The multimodal dimensions of the text attracted their attention – the combination of visual, spatial, gestural and linguistic elements – and text content about a cartoon character called Candace having a secret “crush” on Jeremy, allowed them to experience the known. The teacher used a text with content that was part of their existing lifeworld experiences in order to make links with the new – the knowledge of the conventions of a blog that were remote from many of the students’ prior experiences.

“Experiencing the new” is immersion in unfamiliar, real or simulated, experiences, communities, situations, and texts (Kalantzis & Cope, 2005). For example, the same media teacher introduced students to Apple Photo Booth software for capturing and applying special effects to still images. The students worked in pairs on laptops with built-in web cams. The teacher gave the classes brief instruction using a data-projected image of her computer screen, demonstrating how to open the Photo Booth application using the icon at the bottom of the desk-top, position themselves in front of the built-in web cam, and capture their image using the timed count-down.

Rather than tightly regulate the students’ first use of this software, she allowed the students to experience the new with the affordances of the software. Students soon discovered how to use the “effects” function, systematically applying effects such as “pop art,” “color pencil,” “mirror” and “sunset.” The students’ unreserved laughter erupted across the classroom as peers collaboratively experimented with the new digital media (see Figure 10.1).

Students were later shown how to insert the iSight widget (embedded web application) into their iWeb (web page design software) pages, and were able to transfer their knowledge of Photo-Booth functions to a new application. They created podcasts – videos that are uploaded to the web – in which they presented audio-visual information related to their written blogs. Producing digital media sometimes involves introducing unfamiliar technological knowledge, which makes sense through a degree of immersion – experimenting and interacting with a new digital tool to discover its affordances.



Figure 10.1 “Rollercoaster” and “Fish” special effects

Conceptualizing by naming and theorizing

Conceptualizing is the translation and synthesis of experiences, conceptual forms, language, and symbols into abstract terms and generalizations (Kolb, 1984; McCarthy, 1987). For instance, in the blogging lesson described above, the teacher discussed the meaning of the terms “blog” and “blogging.” Students were required to “conceptualize by naming” the purpose and features of a blog. Blogs were compared to journal and diary writing, because these texts recount experiences or share interests and opinions – “Remember, blogs are quite short and allow you to say what you think of things.” These text types share common features, such as ordering events in chronological sequence, using first person, past tense, and cohesive ties, such as “today,” “then,” “next,” and “later.”

Students learned that words, groups of words, visual and spatial elements can be included in blogs to portray ideas in different ways for certain audiences. By engaging with Candace’s Blog, an online Disney© text, they came to know that blogs are frequently supported by other interactive media content, identifying additional features such as quizzes, games, pictures, polls, downloads, and chat facilities. Conceptualizing by naming involves categorizing and grouping particulars together based on their similarities, despite also having differences (for psycholinguistic theory about naming concepts, see Vygotsky, 1978).

Lisa was described by her Year 4 teacher Margaret as one “who loves to write.” Through a digital media collaborative project between Lisa’s school and a team of technology, media arts, and literacy lecturers, Margaret gained shared access to a class set of laptops on a trolley. She was also introduced to the affordances of iWeb software for producing web sites. The Year 4 class (students aged 8–9 years) had been learning the purpose and functions of oral and written expositions, with the aim that students would produce their own exposition about a world mystery of their own choosing – the Loch Ness Monster or the Bermuda Triangle. Throughout one term, Margaret enabled them to build up their knowledge of the subject matter through a range of conventional and multimodal texts. She taught them the structure and textual features of expositions, with focused learning episodes on grammatical, vocabulary, and orthographic knowledge.

Margaret wanted to extend Lisa’s love of print to develop new capabilities with technologies for inscription. The class participated in eight weeks of specialist media lessons, which involved designing web profiles, blogs, short movies, and podcasts. At the end of the unit, Margaret gave the students the choice to either podcast their written exposition about a world mystery or present it as an additional web page of text. Margaret explained that she wanted the students to choose the mode, such as audio or written, in which they felt most able to communicate their message effectively.

Lisa chose to present her exposition as an additional page of text on her website, as Margaret had anticipated. Lisa’s exposition providing evidence to support the existence of the Loch Ness Monster is shown in Figure 10.2.

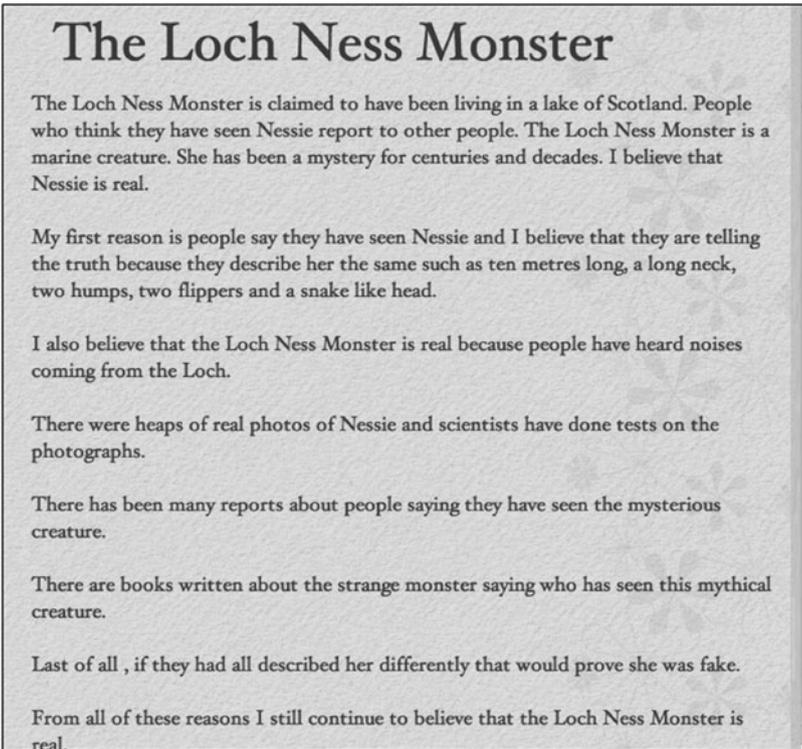


Figure 10.2 Lisa's Web page of text

Designing this web page required Lisa to conceptualize by theorizing arguments for the existence of the Loch Ness Monster. Her exposition begins with a thesis statement, including necessary background information for the reader to contextualize her position – “Nessie” is real. Lisa presents a series of arguments and supporting evidence to support the thesis statement, concluding with a summarizing comment that restates her theory. The key issue is that Lisa had to conceptualize by theorizing, using a language of generalization, involving explicit, systematic, and conscious understandings to create a logically coherent exposition.

Analyzing functionally and critically

Most children and youth today have ready access to a host of consumer-driven media, print, and online texts from a much wider range of sources than previous generations. As a teacher engaged in our research said to her students: “ ... You don't have to agree with the author. That's the beauty of

books!" While experiencing and conceptualizing are important, neither of these addresses the need for analytical knowledge. When used alone, these forms of knowledge may socialize learners to be uncritical and unconscious of the cultural origins of knowledge, and the worldview that validates it. Similarly, it does not involve critically analyzing the social practices surrounding the production and use of multimedia texts (Kalantzis & Cope, 2000).

Children who are old enough to be entertained by videos and television programs need the conceptual tools and knowledge to understand, select, challenge, and evaluate the messages of texts, and to recognize who benefits from the media they consume. "Analyzing" repositions students as active, critical agents, rather than as passive automatons. It involves examining the discreet structure and function of represented meanings (Kalantzis & Cope, 2005, p. 114). Firstly, users "analyze functionally" the overarching function of the multimedia texts that they read or view, making connections between and across modes. Readers and viewers also make connections between the content of subject matter, and the social contexts and purposes of texts (New London Group, 2000). For example, when confronted with Internet advertising, children can ask themselves questions about whose interests are served. They can begin to understand how certain words, images, music, gestures, and animations are chosen very deliberately to catch their attention and influence children to select one product over another.

More importantly, they can be taught to analyze the explicit and implicit agendas and interests behind a text – analyzing critically – whether it be a video game, billboard graphic, or Internet fan site. For example, students might analyze the gendered use of color, font styles, and images in websites aimed at boys and girls. The following section focuses on the extent to which an elementary teacher enabled students to engage in new ways of knowing by analyzing popular media functionally and critically.

In the context of a digital movie-making unit among upper primary students, the teacher taught the students how to "analyze functionally" the representations of power and other values embedded in commercially produced material. The class was comprised of the lowest literacy ability group in the year level, in an Australian school in a low-socio-economic area. Diverse ethnicities were represented among the cohort, including Indigenous, Sudanese, Thai, Maori, Anglo-Australian students, and those from non-English speaking backgrounds.

In the following transcript, the students had viewed several segments of the popular stop-motion animation, "Chicken Run," by Aardman Animations, producers of the Wallace and Gromit films (Mills, 2011).

Teacher: When the door opened and Mrs Tweedie was standing there, the light spilled out onto the steps. Why did they use the lighting in that way? What effect did it give her that she was in

- shadow and the bright light coming behind her when it panned up her leg?
- Jack: Strong.
- Teacher: Yeah, it made her look powerful!
- Ted: Scary.
- Teacher: She did look a bit scary. Ok, how did the creators show that Mrs Tweedie was in power? How did they show that she was the boss, Nick?
- Nick: The expression.
- Teacher: The expression on her face. Did you hear the dog yelp? The door opened and the dog went? [Child barks] Yeah, and did a little yelp – which means that he was definitely scared. What did you think?
- Daria: She had her hand on her hip.
- Teacher: Her hands were on her hips. Her body language showed that she was really very important.
- Matthew: She yelled, “What is this chicken doing here?”
- Teacher: So, what she said was important.
- Julia: You could see her face and her head.
- Teacher: Think of the angle. Where was she? Where are they? [The chickens] What did the creators do to make her look more powerful, Ted?
- Ted: Looking up [camera angle].
- Teacher: They were looking up at her, and she was looking?
- Students: Down.
- Teacher: Down. This made them look as if they were quite small.

The teacher used a series of strategic questions and responses to guide learners to analyze functionally how power was represented through lighting (e.g. “Why did they use the lighting in that way?”), facial expression (e.g. “The expression on her face”) and bodily movements or gestures (e.g. “Her body language showed that she was really important”).

They also analyzed functionally the sound (e.g. “Did you hear the dog yelp?”), speech (e.g. “So what she said was important”), and spatial elements, such as camera angles, spatial relations between characters, and how the viewer is positioned (e.g. “Think of the angle. Where is she? Where are they?”). These questions encouraged students to analyze how the movie and its multimodal elements function to achieve the producers’ purposes (Mills, 2011).

This critique of the movie involved critical engagement and multiple readings that extended beyond linguistic design or written words. The students also attended to the spatial, visual, audio, and gestural elements that work harmoniously to create meanings of significance. Through this functional analysis of multimodal design elements and their dynamic connections, the deeper meanings of the movie were illuminated (Mills, 2011).

A second kind of analysis is necessary when students read and are confronted by the messages in everyday digital media texts. “Analyzing critically” is a process of cross-examining human intentions and vested interests in a design. Questions can be asked about whose point of view is represented, and what the social and economic consequences could be (Kalantzis & Cope, 2008). For example, when analyzing toy catalogs, students consider whose interests are served, identify the intended product consumers, and analyze how gender, ethnicity, and age are constructed in relation to marketing toys for subcultural groups. The learner considers the perspective represented by the design, and the social, economic, cultural, or political consequences that arise from its use (Kalantzis & Cope, 2005).

Another lesson excerpt serves to demonstrate how an upper primary teacher guided her students to analyze critically – to interrogate the underlying intentions and interests of movie authors and producers. Prior to interactions below, the teacher had shown the students segments of the popular animated movie “Chicken Run.” She had replayed certain scenes and addressed key questions, which were reviewed in the following discussion (Mills, 2011).

- Teacher: What is the message that the movie creators are trying to get across to you? What does he really want you to think about during this movie, Ted?
- Ted: Not to stop trying.
- Teacher: You’re not to stop trying. Don’t give up. Oh, Excellent! What’s another message, do you think?
- Child: They are prisoners.
- Teacher: That the chickens are prisoners! What else, Ted?
- Ted: That the chickens want to get free.
- Teacher: To free the chickens. Do you think that’s why they made the movie – to try to make you think about chickens that are in captivity?
- Child: Don’t lock chickens up.

In this teacher-student dialogue, the class was prompted to consider the intentions and interests of the designers of “Chicken Run.” Interestingly, Ted interpreted a key message of the movie as one of developing perseverance – “Not to stop trying.” The teacher readily accepted this as one among multiple possible interpretations of the text. It was Ted who supplied an alternative possible meaning of the text: “That the chickens [in captivity] want to get free.” In the absence of the teacher’s questioning, the learners would not have examined the underlying message about animal captivity, nor recognized the way they were positioned as viewers to empathize with their feathered friends in “Chicken Run.”

The learners gained access to designs of meaning by considering the message of the text (e.g. “What is the message that the movie creators are trying to get across to you?”). They were guided to think about whose point of view or perspective was represented (e.g. “That the chickens are prisoners” who “want to get free”). They examined whose interests were served, and the social and environmental choices associated with poultry farming (e.g. “Are there chicken farms where children are allowed to run free?”) (Mills, 2011).

This example illustrates that analyzing critically involves regarding media texts as being dependent on social practices, political, economic, historic, and ecological contexts. Learners need to engage in analyzing critically to consider how designs of meaning are culturally specific, serving particular social and environmental ends. These learners were beginning to critically analyze the underlying human intentions and interests of the authors and producers, which drives the consumption of multimodal texts in children’s everyday world of textual experiences, from book to screen. They were encouraged to consider multiple readings of texts and alternate points of view rather unlocking or reproducing the “correct meaning.” These powerful knowledge processes are necessary for learners to contest the pervasive consumer culture characteristic of the new times (Mills, 2011).

Applying appropriately and creatively

Barbara is a confident student academically, and producing digital media for the first time was no exception. When given the opportunity to create her first web profile using the iWeb application, she was able to apply the demonstrations by the media teacher to her design. For example, the teacher used a laptop and data projector to demonstrate how to open the iWeb application, choose and modify a template, and how to save and publish the design.

Barbara’s blog page demonstrates that she was able to produce a substantial quantity of written text, applying her knowledge of the technologies, textual conventions, and her experiences of the world appropriately (see Figure 10.3). “Applying appropriately” involves acting upon knowledge learned in a typical way. For example, Barbara’s blog shows appropriate attention to linguistic, visual and spatial elements of the screen, including a substantial quantity of written text in each entry. She modified the iWeb template by inserting her own images with special effects, which were matched to the content of the blog. She included supporting text features, such as a title, summary, and “wish list.”

When applying appropriately, meanings must be represented in a way that conforms to culturally accepted conventions of representation. For example, Barbara successfully applied media applications for blogging using the Web platform, while attending to rules for English grammar, vocabulary choice, punctuation, and spelling. She followed the conventions of the



Figure 10.3 Barbara's blog iWeb page

blog genre, recounting personal experiences in a descriptive way for her class audience. She consistently used past tense, sequenced events appropriately, and varied her sentence types. She used cohesive ties that signal shifts in time: "Two years ago," "then," "when" and "after." Interestingly, Barbara did not capitalize the letter "i" when used alone in a sentence – a hybrid pattern in abbreviated forms of informal digital text. The content and vocabulary of the blog was appropriate to the reading levels of her peers and intended audience. Barbara also applied her new knowledge of the iWeb and Photo Booth software to independently represent her ideas permanently on the screen.

Yet Barbara's blog demonstrated more than a simple reproduction of technology, textual and content knowledge. Exact replications do not constitute applying appropriately because there is always a degree of transformation, an element which is different to that which has gone before (Kalantzis & Cope, 2005). Applying creatively takes knowledge from one setting, adapting it to a new setting in a radically different way. For example, Barbara's blog

was different to the blogs produced by her peers. While her blog contained some elements of the original iWeb template, such as the background color, graphics, and spatial layout, it was characterized by a unique combination of multimodal elements – words, images, font styles, gestures, and special effects – that told her story. Transferring creatively entails removing knowledge from one context to work in a new context in a different way, resulting in generative hybridity, divergence, and originality (Kalantzis & Cope, 2005).

Another example is provided here of an iWeb personal profile by eight-year old Jao (see Figure 10.4). Jao had only lived in Australia for 2½ years, having emigrated from Thailand, with English as his second language. Jao was not confident in public speaking contexts, such as whole class discussions, though he could converse with his teacher Margaret, and several Samoan peers. During literacy lessons, the quantity of his writing was generally lower than that of his age-level peers. The teacher corrected the linguistic elements of his iWeb profile while in a handwritten form, prior to Jao creating this digital text.

Jao's web profile shows evidence of “applying creatively” and hybridization – the mixing of different conventions in a text, which is realized in the

Stats

NAME [redacted]

LOCATION [redacted]

SCHOOL [redacted]

SUBJECTS Writing, Art, Hand Writing

Hi I'm [redacted]
Yea my birthday is [redacted]

Favourite movies
My favourite movie is transformers 1

36:15:55:55
Days Hours Mins Secs

About Me

Hi my name is [redacted]. I like to play soccer.
My favourite colour is red. My favourite food is pizza. I have four sisters. I am the only boy in my family. My favourite singer is Jay Sean. My favourite song is I gotta feeling, Down. High School Musical. My favourite movie is High school musical.

Figure 10.4 Jao's “About Me” page

heterogeneity and creativity of the design (Fairclough, 2000). Hybridization is important because it draws attention to change, rather than stasis, in the digital media designs. For example, Jao's "About Me" page includes a greater emphasis on images than written text, including self-portrait photography that combined conventional and "pop art" stylistic effects. Jao included a hybrid combination of web page features, such as a welcome comment, biographical note, favorites list, birthday countdown, and personal statistics. Digital media production requires that students can create textual designs that are characterized by hybridization, using original combinations of existing technology, textual, and content knowledge.

Similarly, in the process of applying knowledge creatively in digital media design, learners frequently make intertextual connections between the meanings represented in various texts (Cope & Kalantzis, 2000). Intertextuality refers to the cross-referencing of recognizable connections and juxtaposed meanings between texts (New London Group, 2000). For example, Jao's blog contained cross-references to popular songs and movies. Hybrid intertextuality involves transformations of original resources for meaning-making (Fairclough, 2000).

Conclusion

The shape of knowledge for textual production is changing in a digital age. Sophisticated technological knowledge is now a highly demanded credential for cosmopolitan recognition in globalized networks. In volatile economic climates in which many tasks and skills will gradually become automated for scale and efficiency, workers of the future will need to be creative, socially competent, and knowledgeable digital users and designers (Frey & Osborne, 2013). This article provided evidence for an active and dynamic process of "coming to know" when students create digital and multimodal texts. Learners were guided through a process of experiencing, conceptualizing, analyzing and applying new combinations of technological, textual, and content knowledge. Creators of digital media do more than simply reproduce a narrow canon of fixed disciplinary content and print-based conventions. Rather, learners engage in the transformation of existing multimedia designs, creating globally oriented funds of knowledge that are easily expanded and adapted to meet changing criteria for success in the new times.

Note

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11

Learning by Design: Reconstructing Knowledge Processes in Teaching and Learning Practices

Walkyria Monte Mór

This chapter discusses the ‘learning by design’ concept of the Pedagogy of Multiliteracies in a Brazilian project. It first contextualizes the arrival of the literacies/multiliteracies/new learning ideas in Brazilian schools and academia. This came at an opportune moment, after the ‘years of lead’ of the dictatorship. In the Brazilian context, Paulo Freire’s ideas had in the 1960s brought new insights and new breath to education in Brazil. These were – in terms of a nationwide public education program – somewhat invisible in the 1960s but rescued in the late 1980s and beginning of the 1990s. Much discussion about the suitability of particular literacy approaches has gained academic focus since then. The Multiliteracies/new learning proposals have found resonance in Brazil, in view of their affinity with debates that had been disseminated by Freire a few decades before. The Multiliteracies/new literacies founding theories have enabled a reconfiguration of those studies in the face of a new socio-historic movement in Brazil and abroad.

In keeping with research outcomes that demonstrate the interest of rethinking conventional educational practices in Brazil, this chapter discusses the ‘learning by design’ concept, acknowledging it as a reinvigorating idea that has also represented a challenge for learners – in this case, both teachers and students – in Brazilian experiments. The text reports on a case study that aimed to work with the ‘knowledge processes’ – experiencing, conceptualizing, analyzing, applying – as a way to respond to the notion of learners-as-knowledge-producers. The study focused on knowledge processes through which university learners of a Teacher Education Program created a framework to work on multimodality as they redefined the conventional theories and practices of written narratives. The out-of-school experiences and knowledge of learners using new technologies, multimodality and meaning making were considered insightful for learners as they brought this knowledge into conventional educational settings.

Introduction

The second half of the 20th century represents an important moment for Brazilian culture and education. Ideas valorizing a Brazilian cultural identity

were strengthened, disputing the attention and space accorded in the post-Second World War era to foreign influences and expectations of affluence in the country. Perhaps it was not a coincidence that new Brazilian social and cultural expressions emerged – in terms of rhythms, the emergence of *bossa-nova* would well illustrate that moment. Likewise, new perceptions were raised around an educational model/concept that would better suit Brazilian needs – Freire's ideas in this area began to attract wide acceptance, at the same time as they generated concern. The acceptance was due to the fact that he created 'an educational approach that went beyond the confines of ordinary methodologies', as stated by Irwin (2012, p. 3). That approach was considered to be an attempt to construct a new epistemology or theory of knowledge by those who studied his project, such as Elias (1994). The concern was due to the risks the proposal meant to the historic moment. The military coup in the early 1960s interrupted Freire's literacy and political program in its very roots. As dictatorship lasted until the end of the 1970s or beginning of the 1980s, only then did the ideas concerning changes in the educational agenda little by little come back into debate.

By late in the 1980s and beginning of the 1990s, studies of literacies by Street (1984), Goody and Watt (1963), Olson (1994), and Olson and Torrance (1991), reinvigorated the Freirean discussions on literacies that had started in the 1960s. Street's reasoning about the autonomous and ideological reading models made sense to those who for long had been hoping to renew discussions about the program of literacy in Brazilian education. Those ideas enabled a renewal of energetic discussions on the theme. If Freire's theories had inaugurated the first generation of a movement towards a new view of literacy in Brazil, the theories debated around 20 years later were seen as belonging to a second and renewed generation. In the first generation, the relevance of the proposal lay in the fact that it questioned the view of literacy embedded in phonics methodology. This was taken to be fragmented, dislocated from the students' reality and disconnected from the value of social awareness that was so much emphasized by Freire in his response to the strong presence of coloniality in the country. At that social and historic moment, learning how to read and write meant being able to recognize and reproduce syllables, words and phrases as the very elements of reading and writing. At the end of one year, the students would be approved as literate if they showed the required abilities in a specific assessment.

In the second generation of Brazilian literacy revision, Street's criticism of the traditional view of literacy resonated favorably, considering that his reflections converged with the Freirean social concerns, as the following shows:

The standard view in many fields, from schooling to development programs, works from the assumption that literacy in itself – autonomously – will have effects on other social and cognitive practices. Introducing

literacy to poor, 'illiterate' people, villages, urban youth, etc., will have the effect of enhancing their cognitive skills, improving their economic prospects, making them better citizens, regardless of the social and economic conditions that accounted for their 'illiteracy' in the first place. I refer to this as an 'autonomous' model of literacy. The model, I suggest, disguises the cultural and ideological assumptions that underpin it so that it can then be presented as though they are neutral and universal and that literacy as such will have these benign effects. (Street 2003, p. 77)

Street's ideological model of literacy was welcomed in Brazilian academia as it offered 'a more culturally sensitive view of literacy practices as they vary from one context to another'. It also posited that literacy was 'a social practice, not simply a technical and neutral skill', besides being 'always embedded in socially constructed epistemological principles' (Ibid., pp. 77-78). Research on literacy has today surfaced again under this new perspective. However, it should be noted that much of that theory has influenced the teaching of Portuguese, as it is the students' mother tongue. Supposedly, it was interpreted that reading and writing abilities should be developed in the Portuguese language. It was presupposed that abilities in both reading and writing in the school curriculum are carried in the mother tongue, a presupposition that overlooks the involvement of other school subjects in the literacy process. School subjects, then, blame the teaching and learning of Portuguese for students' eventual failure in reading and writing.

At the same time, in the teaching of foreign languages in Brazil, instrumental projects such as the 'reading/writing for specific purposes' were quickly and widely disseminated. The instrumental view was broadened, though, as a way to expand abilities that had been narrowly built (as Freire's and Street's findings had previously evidenced), such as anticipation, prediction, inference, and critical perceptions. There has been research favoring the extension of such abilities to the learning of the mother tongue, signaling the benefits of the integration of both languages.

Another factor that strongly influenced the studies on literacies in this second generation was Brazil's integration to the Program for International Students Assessment (PISA) in 2000. Around 80% of the assessed Brazilian students¹ scored level 2 (out of the 5 levels) and showed insufficient abilities to read and write, being described as 'functionally illiterate' young people. Although they had become literate – by learning how to read and write in the conventional view of literacy – they still needed to develop understandings that involved interpretations (or sense making), inferences, perceptions of subtleties in communication, such as irony and sarcasm. It meant that a great percentage of students had developed forms of literacy necessary for professional functions that demanded more than the traditional literacy was able to provide. The literacies/Multiliteracies/new learning ideas

(New London Group 1996; Cope & Kalantzis 2000; Kalantzis & Cope 2008; 2012; Kress 2003, 2010; Lankshear & Knobel 2003; 2008; 2011; Gee 2004; 2013; Gee & Hayes 2011; van Leeuwen 2011; Luke 2004; Luke et al 2013) reached Brazilian schools and academia at an opportune moment in late in the 1990s and beginning of the 2000s. The 'years of lead' of the dictatorship had little by little opened to change. The ideas of Paulo Freire – that had meant new insights and new breath to education in Brazil in terms of a nationwide public education program in the 1960s – were rescued by late in the 1980s and beginning of the 1990s. The Multiliteracies/new learning proposals found resonance in Brazil in view of their affinity with debates that had been disseminated by Freire a few decades before. The Multiliteracies/new literacies founding theories enabled a reconfiguration of those studies in the face of a new socio-historic moment. The adequacy of literacies teaching and learning has been the focus of much academic discussion since then. Within these ideas, a third generation of literacies theory and practice has been identified in Brazil.

This third generation view of literacies has gained growing space in the national debate about education. It suggests that the conventional educational models that had been adopted in various Western countries no longer respond to all of the needs of Brazilian society. There have been transformations resulting from various factors, but mainly from the phenomena of globalization and digital technology. On a smaller or larger scale, these transformations gradually alter the social, cultural and political bases of various fields in societies, including the arenas of school and university. This view of literacies is recognized as the one that may promote transdisciplinarity among the various school disciplines. It also prompts a rethinking of curriculum design/policies, the school-society relationship, the teacher-student relationship, language in its modalities, and language in its communities of practice. In addition, it calls forth investigation of the phenomenon of globalization and the advent/presence of digital technology in society.

Based on the new literacies/Multiliteracies premises, a National Project for Teacher Education² was designed to promote: (1) investigation of the dimensions of contemporary literacies; and (2) intervention through an ongoing teacher education program. It has functioned within a nationwide network of 22 public universities, aiming in a first phase to strengthen foreign language teaching in elementary and secondary schools according to an educational-cultural-linguistic perspective oriented by the new literacies and Multiliteracies.³ The proposals' broader views – which implied multimodalities in language and communication, knowledge construction, digital epistemologies, meaning-making agency, and allowing the rethinking of education in view of the new or renewed social challenges – were soon adopted in school and university programs, becoming a promising focus in Brazilian education. Since then, those views have provided elements to rethink 'what citizen?' and 'which abilities?' should be given relevance

considering the expectations of, for instance, an active or engaged citizenship. For these reasons, the literacies/Multiliteracies proposals have enjoyed growing acceptance in Brazilian universities and schools.

In sum, the three views of literacies provide evidence of significant changes in the concerns in Brazilian education. The first, standing for a project of 'alfabetização', as literacies were called in Portuguese, is the read-and-write-code-breaking perspective. In the second, literacies mean going beyond the linguistic code and the autonomous model of reading, responding to the need for broader abilities. In the third, literacies are seen as an educational project that would link the traditional, but still meaningful and responsive, concepts of educational practices to the current aspirations, promoting their revision while they are integrated with the 'multi' of the digital, and the diversities among learners. This integration seems to be responding to the expectations of an educational reform movement aiming to address social changes across a range of different social contexts and communities in Brazil.

Although those views of literacies are identified as in 'different generations', giving the impression that one view replaces the other, or that the third one is predominant in Brazilian education, the situation is more complex. Considering Brazil as a whole, the three views coexist. For various reasons, however, we will not focus on this in this chapter, thus keeping up the book theme and aims. This text concentrates on expanding the reflections about the third view of literacies, focusing on a university segment in which most of the undergraduate students are undertaking a teacher education program. The reflections are prompted both by the experience of praxis in this view of literacies – the encounter between the 'new' and the 'old' – and its pedagogy, that is, the 'learning by design' orientations that involve experiencing, conceptualizing, analyzing, and applying in the processes of knowledge construction.

Enthusiasm and challenges

By observing the dialogic relationship between 'the new and the old' and the enthusiasm-challenge effect encapsulated in this dialogism, some reflections are raised concerning the aforementioned National Project. These reflections are constructed by means of a parallel to the reasoning suggested by Kalantzis and Cope (2012, p. 21) as they discuss the connections between language and globalization, that is, how 'humans have made meanings in three historical moments'. The first, globalization, would be ingrained in the 'first languages' historic moment, referring to 'the languages used before we had writing as we know it'; the second, in the development of writing. They analyze this second moment thus: 'the consequences of writing and how this culture of writing intensified with the mass application of printing after the 15th century and continues to modern times'. The third globalization is,

then, identified in what they consider ‘the new cultures of meaning-making that emerged during the 20th century, supported by photographic technologies, and later technologies for the electronic production and distribution of meaning’.

In a publication dated 2012 (though, in previous ones the ideas had already been enunciated) the authors expand the assertions about the multiple globalization perspectives. The comparisons and contrasts between the three different historic moments allow the reader to realize how influential the ‘second globalization’ has been to the consolidation of institutionalized ways of teaching and learning. From their summary of the three globalizations, it is possible to infer that the second – when writing started becoming socially disseminated and valorized, portrayed as a cultural moment whose ideals can be identified as the ones of the Enlightenment philosophies – assumes an overarching role in the definition of the requirements to enable the teaching and learning of writing:

Language is simplified in many respects; narrow social functions of writing to serve elites. Meanings are standardized and homogenized. Conformity is required to generate stabilized, official versions of standard languages. Separation of modalities of meaning occurs and privileging of the written word (2012, p. 37)

In pedagogical terms, the view of language in the second globalization arose from didactic or pragmatic purposes. In the face of the challenges to promote the teaching and learning of writing and in the diversity found in languages that vary inside the same communities, homogeneity is set as a solution. That is, a linguistic structural system is agreed to guide the prevailing norms, setting the ‘official versions of standard languages’. This represents a moment when literacy is developed under ‘social pressures to uniformity’: ‘Literate languages also tend to standardize meanings – in other words, to expect or require that people use them in exactly the same way’, as Kalantzis and Cope depict it (2012, p. 33). And they add, ‘schooling is to have all citizens speaking, reading and writing a common language’, in the observation that the assimilation of outsiders, for instance, indigenous people and migrants, necessarily required the outsiders’ following the same view of schooling in such a social process.

The simplification of languages then came to favor the teaching and learning of writing, as writing was at the center of this idea of knowledge and education: meanings, linguistic structures and views were standardized within official versions of language and culture. This perspective seems to comprise the idea of ‘lexis’ and ‘grammar’, closely related to the teaching and learning of writing. In this sense, other references to a process that has involved uniformity and homogeneity can be cited. Kress and van Leeuwen (1996, p. 1) take for granted the widespread understanding of ‘grammar’ in

their extension of the concept to visual design. They affirm: 'Just as grammars of language describe how words combine in clauses, sentences and texts, so our visual "grammar" will describe the way in which depicted people, places and things combine in visual "statements" of greater and lesser complexity and extension'.

Likewise, Gee and Hayes (2011) express a similar reasoning in relation to writing as they explain their three historic moments of language, being these: orality, writing and digital media. To them:

[f]or centuries people identified the breath with which we speak with the spirit or the soul and the language they spoke with their unique humanity. Written language froze that breath, allowing it to travel far and wide, allowing the growth of cities, empires, and institutions. Digital media have unfrozen it again, creating a voice that can travel far and rapidly among "everyday people". (p. 5)

In a later publication, Gee (2013) uses the term a little differently, however, still referring to the selection and freezing of procedures to reach a certain goal. This time, he alludes to institutions as 'frozen thoughts' built under the process of standardization, considering that 'an institution is a set of rules, procedures, conventions, and structures of authority that govern how a group of people will work to accomplish a purpose' (p. 5). 'Standardization is an important part of any institution. In a court, the language, procedures, documents, and practices of law are highly standardized' (p. 86). He warns, though, that the frozen thoughts usually found in institutions – and even in minds themselves, have faced the challenge of 'unfreezing' in the era of digital media.

The notions of 'writing as second moment of globalization', 'grammar', 'frozen breath' and 'frozen thoughts' give context to Brazilian teachers' feelings of enthusiasm and challenge when they come to discussions about the third generation view of literacies. The enthusiasm is grounded in the fact that this perspective opens up new possibilities, providing new insights – a new, unfrozen breath and ideas for rethinking education and teacher education. The idea of challenge is raised when it allows and incentivizes teachers and students (citizens, as a whole) to make use of or develop abilities that are not fostered by the procedures in the narrow and standardized approach to literacy. These new abilities can be highlighted in the concept of 'design', as do the literacies and Multiliteracies proposals. As argued by the New London Group (2000, p. 19) 'Design has become central to workplace innovations, as well as to school reforms for the contemporary world. Teachers and managers are seen as designers of learning processes'. The group defines design as 'forms of meaning because it is free of the negative associations for teachers of terms such as 'grammar'. It is a sufficiently rich concept upon which to found a language curriculum and pedagogy' (p. 20).

Indeed, the investigations in the Brazilian National Project based on the new literacies/Multiliteracies theories show the participants' enthusiasm to work with the notion of design, connected to their perception that more work is required to promote education under the concept of design. Their perception would then reinforce the New London group's assertion that '[t]he notion of design connects powerfully to the sort of creative intelligence the best practitioners need in order to be able continuously to redesign their activities in the very act of practice' (p. 19). The group recommends attention to the available designs – 'grammars' of various semiotic systems and the orders of discourse as resources that enable the evaluation of the design adequacy and eventual need for redesign. They also emphasize that:

in designing texts and interactions, people always draw on systems of sociolinguistic practice as well as grammatical systems. These may not be as clearly or rigidly structured as the word 'system' suggests, but there are nevertheless always some conventional points of orientation when we act semiotically. (p. 21)

It can be understood, thus, that an ability to perceive and analyze environments to decide what should be redesigned or maintained, becomes of major priority. Some of these abilities have not necessarily been the focus in the grammar-based conceptualization of education, an outcome that now has represented a challenge for both teachers and students. However, the challenge has been joyfully faced, reaching more favorable than not-so favorable outcomes. To illustrate it, an experiment in the 'learning by design' proposal is analyzed in the following paragraphs.

Narratives: Learning by design

Motivated by designing an experiment in which theories and practices would be woven backwards and forwards across and between different pedagogical moves, the curriculum of a Brazilian university undergraduate program in languages was redesigned. This movement backwards and forwards has been described by Luke et al. (2004) in their definition of the learning process within a Multiliteracies curriculum. In our project, language students (and most of them would work as teachers), developed theoretical concepts and respective practices of narrative.

From the design that involved the study of theories and practices according to a conventional premise of narratives, the discipline was redesigned to add new elements in the construction of narratives in which the students would create and exercise the authorship of their own texts. Bruner's concept of narrative (1997) was selected as the one that opens up for the hypothetical and the real-possible specter of perspectives that constitute the interpretive mind. His view, and Brockmeier (1996) also argues this, enables

subjectifying the world as one of experimental and exploratory options where the fluidly material and symbolic reality of actions, minds and lives merge. Narrative construction becomes central in Bruner's discussion of the educational functional of language. For him, the culture of social realities is constantly recreated in the process of negotiating meanings and interpretations – *meaning-making* in the literacies/Multiliteracies proposals. This occurs between the participants in communities, while at the same time the culture has institutions and norms that regulate actions. The author claims that reality is not 'the thing' and is not in the mind; it is in the act of discussing and negotiating meanings in social concepts. Thus, considering his assertions that reality is not fixed, ready, nor given, it is understood that education can contribute to society by developing its citizens' active roles in the elaboration and re-elaboration of their own culture. This requires going beyond the spectators' canonic roles whose actions are restricted to the conformity of what are understood as adequate social rules.

An interesting aspect in Bruner's studies about narrative constructions is related to linearity and sequence. He rethinks the traditional sequential ordering of narration, and suggests that different narrative sequences are just as characteristic. Earlier, Goodman (1981) argued that any modality of narrative (he particularly mentioned the descriptive and the imagetic ones in his studies) can be constructed according to any sort of (re)ordering and should be acknowledged as such. The implicit and explicit enunciation, he adds, would always provide the elements from which the interlocutor can make meanings. Following the same reasoning in his studies about time and narrative, Ricoeur (1988, p. 32) shares this view of *dechronologization* by exposing his perception of time and of the difficulty in its definition whenever narrative temporality is reconstructed. In the face of this observation, he assumes that contradictions are necessarily a present factor in narrative constructions. Although he reaffirms that time is a major element in narration, to him, one temporality cannot be reduced to another; but one temporality may, though, hide another. He reasons from the perception that a reconstructed fact has phenomenological characteristics, meaning that the sequential exposition of a phenomenon may show asymmetry between history and fiction.

While approaching literacies and critical literacies, Muspratt et al. (1997) similarly pinpoint the relevance of an education that is engaged with the teaching of cultural ways of seeing, describing, explaining, broadening views about textual representations, values, ideologies, and discourses. They also stress the need for learners to position themselves, expand their views of the world, and understand critical issues, such as the fact that reading is intrinsically connected with distribution of knowledge and power in societies. These assertions evidence an interest in the emphasis on agency and critique, through practices that favor the development of these abilities, however, in a renovated way from the ones seen in other views of literacies.

Considering these perspectives and agreeing with the necessity for – and the challenge of – designing practices that reflect different possibilities of knowledge processes, which includes the practice of meaning-making, a proposal of working with narratives was found to be a suitable focal point for university students. Insightful results emerged, in a plan that counted on theoretical and analytical studies about language as discourse. This part of the design – the redesign of the discipline – was thought to be the ‘overt instruction or conceptualizing’, as the learning by design pedagogy or pedagogy of multiliteracies identifies it. It implied the weaving of theory and practice, besides the students’ experience of being active conceptualizers, as it is here depicted. Two views of conceptualizing were identified in this part of the process: conceptualizing *by naming*, in which students learn about social concepts of narrative, with digital technology narratives being focused on; conceptualizing *with theory* that involved reading theories about narratives, meaning-making, multimodality, multiliteracies, critical literacy, authorship and agency. As a result, they developed their own concepts to design a successful multimodal narrative.

Narrative construction and meaning-making

For the development of narratives, the process of experimenting and experiencing is observed in the students’ planning and producing multimodal narratives. Here they experience the known by describing their own challenges when facing the entrance exams to university. At the same time, most of them experience the new when they learn about the group participants’ own narratives and also learn about *Flash software* by themselves to develop the multimodal activity. They all worked in groups, by selecting partners under the criterion of affinity and interest, considering that the definition of a theme was required.

For this chapter, only one of the group works has been selected to discuss the knowledge processes captured in the *Learning by Design* schema. Their chosen converging theme was the group’s experience in the entrance examination to the university. Narrators other than the undergraduates of the group were invited to join this work: two professors and two secondary school students who were about to take the entrance exams to university. The group experiment aimed at contemplating both the threads of theories and practices studied in the discipline (language as discourse, narratives, meaning-making, multimodality, multiliteracies, critical literacy, authorship and agency) combined with their out-of-school experiences and knowledge. This combination allowed them to practice another part of the process: analyzing, and they did it both functionally and critically. They analyzed the functions of educational and university systems besides evaluating the adequacy of technological support to perform the task. Their critical analysis refers to educational and social inequalities and access, as later shown.

Participants recounted their hard work, difficulties and anxieties during their preparation for the entrance exams and facing the toughness of exam questions themselves. Their creative idea ended up in an innovative activity, especially when one considers the conventional ethos that the university environment represents to them. They worked on the purposes of narrative development with a multimodal reconstruction of their university entrance exam narratives. Their discussions covered what should be prioritized by the group in relation to the selected theme of entrance examinations to university, the planning and writing of individual written scripts, the filming of individual narratives, the choice of software to produce the collective narrative, and the construction/production of the group's collective narrative.

The group's proposal to produce a multimodal narrative was a new activity for all of them and different from the conventional written work usually required at their university. This reflected their expectation that this project would be more stimulating and meaningful to learners, creating opportunities for them to practice 'performance epistemology', as Lankshear and Knobel put it. This was a moment when they could use the knowledge they had to develop and weave this into communicative action, thus applying their understanding to the complex diversity of real-world situations. In the process of applying knowledge, two skills are evidenced: their applying appropriately the making of the video/narrative and their applying creatively in the text design what was genuinely innovative, highlighting what had been transformative of their lives/world.

The individual narratives were filmed with the use of a regular digital camera using its 'video' option. The same camera was used to register the narrative of each group participant; the camera allowed a five-minute long filming sequence. Most of the filming site was a classroom showing the chalk board as background, as a metaphor for the 'right place' for the ones who had undergone and been successful in the experience. The narratives of the students who were about to experience the entrance exams were recorded in an outdoor area near the main entrance of the university. The metaphor, in this case, was the 'gate', as the boundary or barrier still to be overcome. All the processes of collective narrative construction were performed by the students themselves, without the participation of the teacher, showing the students' autonomy/agency in the task in which they were engaged.

The students made use of *Flash* software for the editing and assembly of the filmed narratives. The teacher did not have the same familiarity with that software as the students did at that time. For the final assembly, the students created a design that enabled the interaction of the spectator with the non-linear visual text. The screen image was created in an allusion to a big framed picture. Its center looked empty and the frame around it had small pictures of each narrator, pictures that resembled document-sized photographs (see Figure 11.1).

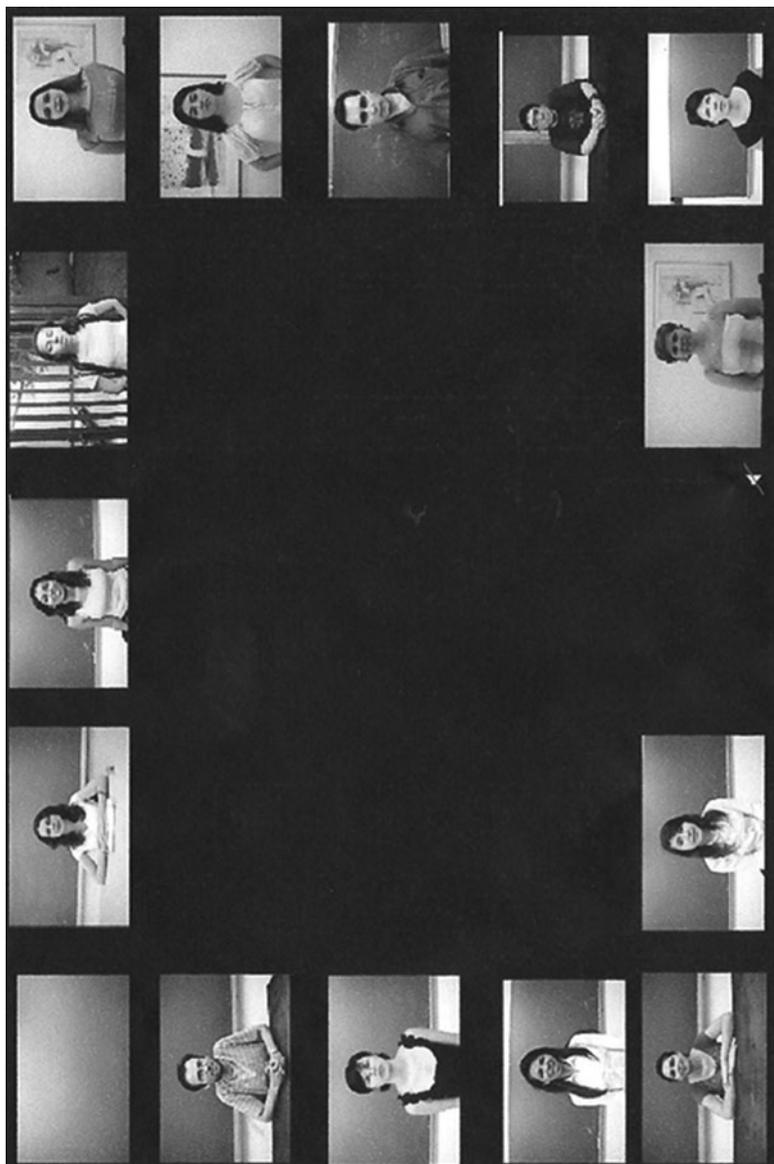


Figure 11.1

Each small still photograph brought the narrative of its bearer to the screen. As one clicks on the bearer's photograph, its narrative is shown in the empty center; two options are offered: a single or a double click. On a single click, the photograph is amplified and shows the student's written narrative (see Figure 11.2). A double click on the still photograph gives, then, movement and voice to the text, transforming its previous modality into an audio-visual narrative (see Figure 11.3).

The students' sequential pictures were displayed on a frame mode. This display allowed the spectator to choose the sequence and the narrations that he/she wanted to watch, reflecting the views of both Bruner (1997) and Goodman (1981) that advocate that the interlocutors may make meanings from any narrative ordering. This perspective also reflects Ricoeur's recognition of dechronology (1988) as a characteristic of narrative construction, considering that the references in the reconstitution of histories may show asymmetry between history and fiction. This effect makes it possible for individual narratives to be built in varied sequences. The viewer, in turn, can choose the number of narratives to build and watch, by accessing the frame and assembling the students' histories into numerous and different collective narratives around one topic.

In the assembly of the multimodal narratives it is not possible to know whether there was an order in the filming of the histories, nor was this the purpose of the activity. Besides, the narrators allude to different temporalities, because although they are in the same academic semester, the entrance of the participants to university did not occur in the same year. In addition, some students narrated previous experiences in other exams or graduate courses, in cases where the present graduate option was not the first. Woven around the difficulties and the traumatic experience the exams represented (and still represent) to some, the time repairing effect of time repairing pain is observed. As the years at the university pass, their recollections of anguish and anxieties little by little have faded away; the certainties and uncertainties in their academic choices have become less heavy; their discontinuities and discoveries seem to have converted into maturity.

Interestingly, in the multimodal activity, the students inserted one more narrative modality, built visually with chalk on the green board, with the use of words and signs and no sound or voice. The picture of the green board occupies the space designed for one of the document-sized photographs (see left corner on the top of Figure 11.4). As one clicks on it, the still image gains movement and the spectator starts seeing a student's hand writing and drawing of some words on the board.

A silent narrative begins, reported in the form of these most basic elements of a traditional classroom: green board, chalk and words. These few ingredients silently reconstruct and portray the narrators' collective history path. However, there is little opportunity in this medium to register the challenges they had faced: kindergarten, elementary school, secondary

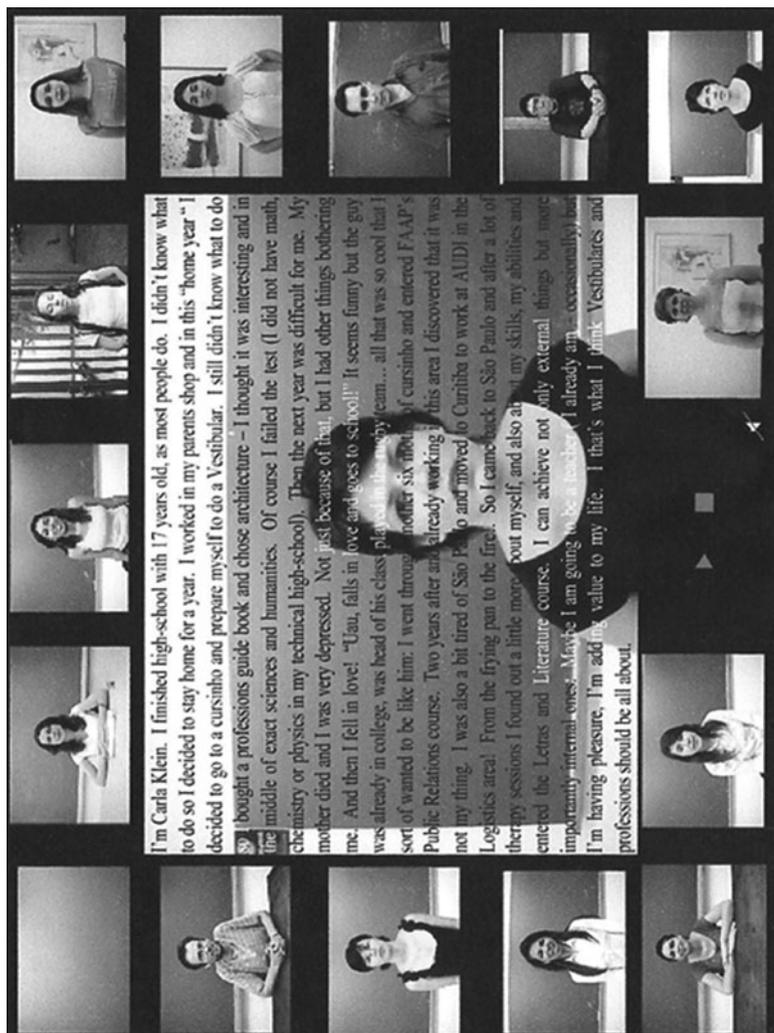


Figure 11.2

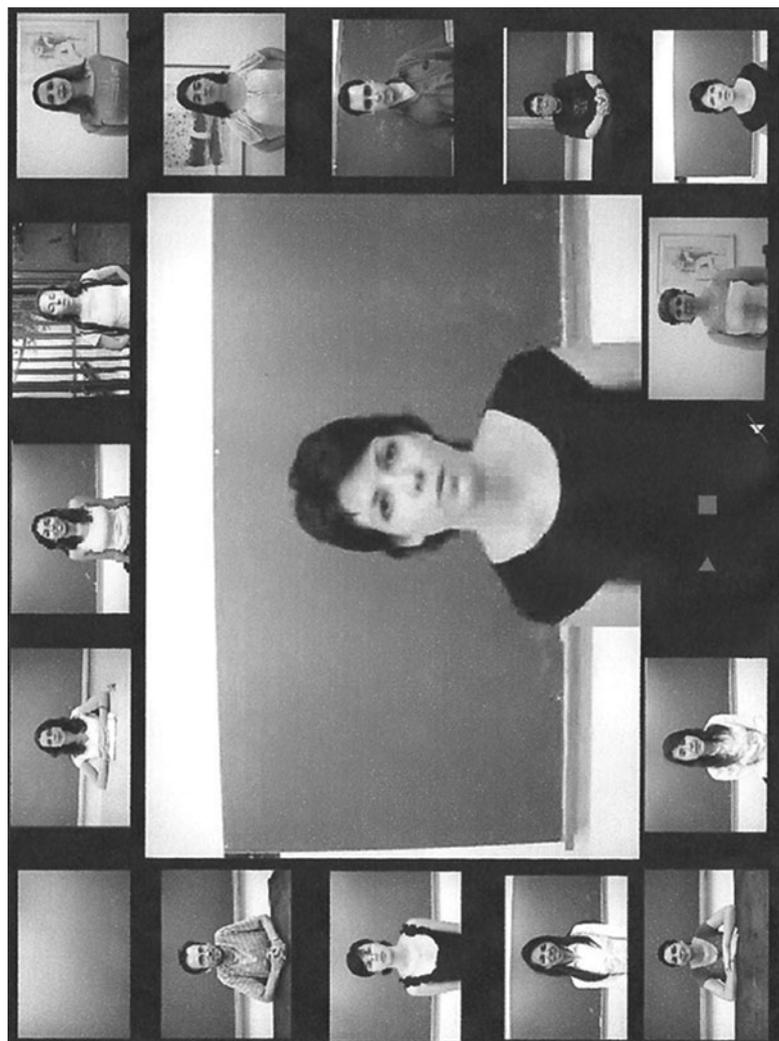


Figure 11.3



Figure 11.4

school, preparatory courses to the entrance exams to university, entrance exams to university (several times, for some of them, as indicated in Figures 11.5 5 and 11.6), and finally, their entrance to university (see Figure 11.6).

In the reconstitution of their trajectory, a critical notion is revealed at the end when the narrators signal a concern that makes the undergraduates express uncertainty: finding a job after graduating (see Figure 11.7).

While reconstructing their own narratives, another process can be perceived in the students' critical depictions. As they evaluate power relations in the social function of the university entrance exams, and the favorable and unfavorable ways in which the successful students are socially viewed, they compare their future possibilities in the work market with the effort demanded to succeed in the university project. They express how success is relative to a pre-conceived idea that public university students are the ones who come from well-off private elementary and secondary schools. Thus, it is likely that they are the best-prepared candidates for the exams to university, which would guarantee approval on the first attempt. They also deconstruct other impressions that have long been held about their enrollment in university. For instance, it is often assumed that they have been approved for their first academic course/career option; or that the students who pass the entrance exams have a guarantee of success at the university, feeling free from the anguish and anxieties felt by a great part of other types of students, mainly those considered disadvantaged. The recorded histories also highlight their great concern with the labor market, showing their engagement with the socio-economic situation in which they live, including a critical view of the fact that academic studies do not represent a guarantee of a job in Brazilian society nowadays. Important to understanding these anxieties around status and employment is the location of these students within a low-status course (language education) at an academically elite public university.

The collective narrative resulted in an interesting and stimulating experience for both students and researcher-teacher. The result was to weave practice and theory, along the lines of the network mindset portrayed by Castells (1999). According to him, types of mindsets are observed other than the linear and typographic ones much emphasized in schooling and processes of social participation. A disruption of linearity and a non-conventional narrative ordering and time were perceived in the multimodal narrative itself. Another addition to the group's learning is related with Muspratt, Luke and Freebody's educational perspective (1997). For these authors, education must commit to the plurality of views, broad understanding of text representations, and primarily, to the critical perception that meaning is not previously given in texts. For them, narratives are woven by subjectivities and can constantly be reconstituted and resignified.

Performance epistemology is another theoretical principle in the activity. In this sense, the narrative studies in this proposal – focusing on the ways by which human beings live and represent time, and how their histories

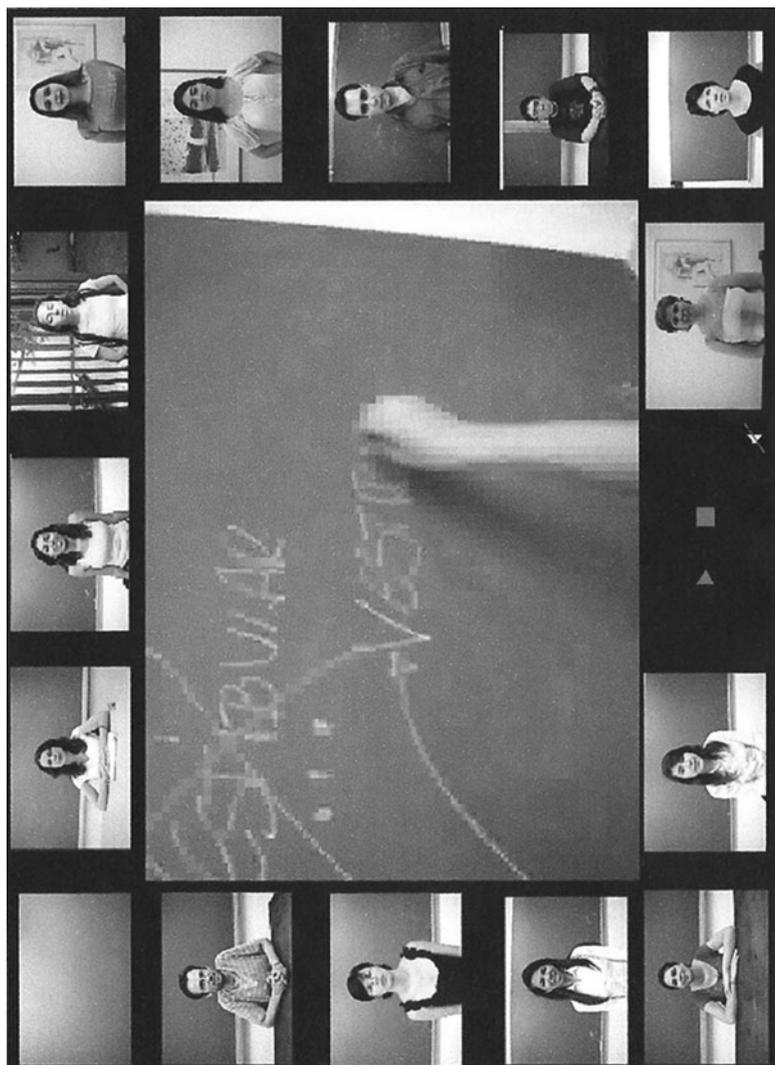


Figure 11.5

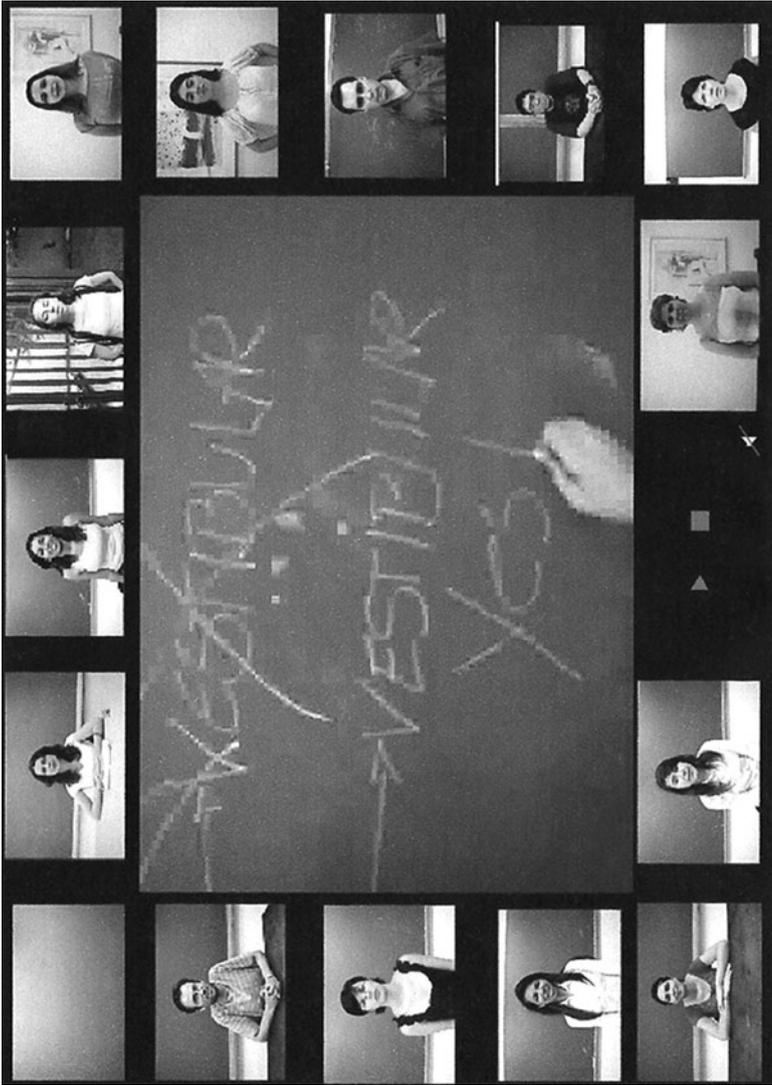


Figure 11.6

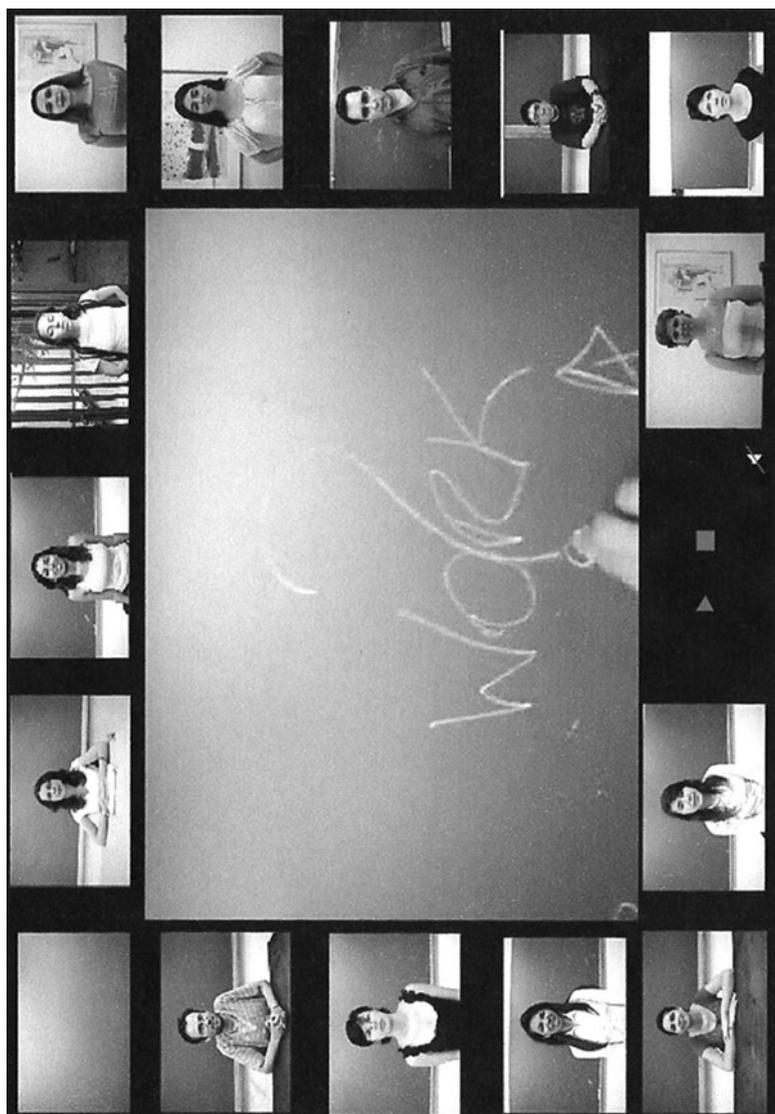


Figure 11.7

are elaborated and re-elaborated – tie/put together the various purposes of a critical education, as this chapter has shown. In all, the experiment showed the potential to enhance different reading paths and meaning-making processes, allowing the interlocutor to read beyond typographic logics through the visual proposal and multimodal assembly.

Final considerations

Having contextualized language education within the three generations of views of literacies that have predominated in an overlapping fashion over the years in Brazilian education, the text discussed the redesign of a university languages program through the adoption of a third generation of premises in relation to literacies. It analyzed their appropriateness for the social, cultural and educational changes before phenomena such as digital technology and globalization. It also analyzed this view of literacies as an educational proposal that represents both enthusiasm and a challenge for both teachers and students to whom creativity, flexibility, innovation, agency, initiative-taking, and decision-making are requisites/characteristics/abilities that had not been part of prior views of education where the focus was more grammar-set than design-set.

Then the text reported on a case study that aimed to work on the assumptions of ‘knowledge processes’ – experiencing, conceptualizing, analyzing, applying – as the students (learners-as-knowledge-producers) built up a multimodal narrative, by reconstructing pre-established concepts of the discipline – such as narrative – into Multiliteracies perspectives. The process was built by experiencing *the known* (describing own experiences) and *the new* (learning about others’ experiences, learning Flash by themselves); conceptualizing *by naming* (social concepts of narrative, digital technologies) and *with theory* (theories they read, and theories of their own, developed by themselves); analyzing *functionally* (systems and technology) and critically (referring to inequalities and access); applying *appropriately* (making the video/narrative); and creatively (what was genuinely innovative in the texts, transformative of their lives/world). The academic practice of out-of-school experiences and knowledge with new technologies, multimodality and meaning-making were considered insightful and fundamental for learners’ redefining conventional settings while developing knowledge processes in the learning experiment.

In the understanding that ‘schools regulate access to orders of discourse’, and that ‘curriculum now needs to mesh with different subjectivities, and with their attendant languages, discourses, and registers, and use these as resource for learning’, the New London Group (2000) appraises that ‘the role of education is to develop an epistemology of pluralism that provides access without people having to erase or leave behind different subjectivities. This has to be the basis of a new norm’ (p.18).

Thus, we can see that the search for designing activities such as the one presented in this paper is relevant and necessary for today's learners. As learners acknowledge the theories implicit in their daily social practices, they are able – and eager – to mingle/weave knowledge that previously used to be separated into intra- or extra-school contexts. Students usually have few academic opportunities for building up knowledge in a grammar-based conceptualization of education. The narrative activity described in this chapter is evidence of the relevance of the design-based proposal of Multiliteracies. One of the big challenges for Brazilian universities (and schools as well) is to bridge social practices and academic practices. In this social and educational project, the new literacies and Multiliteracies proposals can greatly contribute.

Notes

1. Source: INEP - Instituto Nacional de Estudos e Pesquisas Educacionais 'Anísio Teixeira' (National Institute for Educational Studies and Research) <http://download.inep.gov.br/download/internacional/pisa/PISA2000.pdf>
 "Brazil's mean performance has improved since 2000 from 396 to 410 score points, showing an annualized change of 1.2 score points. Figures accounting for social and demographic changes between 2000 and 2012 show that this improvement in reading performance can be entirely explained by improvements in the economic, social and cultural status of the student population". Source: http://download.inep.gov.br/acoes_internacionais/pisa/resultados/2013/country_note_brazil_pisa_2012.pdf
2. National Project on Teacher Education "New Literacies, Multiliteracies and the Teaching of Languages", directed by W. Monte Mor and L. M. T. Menezes de Souza. 2009-2014 Outcomes: Revision of Teacher Education Programs in various of the participating universities; In-service Teacher Education Projects; Participation in language policy discussions and design for public schools; Network of experience exchange and studies; Publications (books, chapters and articles); National and international exchange with universities and academics of various Brazilian states and other countries. Publications: 21 books; 88 book chapters and 134 articles in academic periodicals. Finished supervisions: 18 PhD students; 40 Master's degree students; 53 Undergraduate students and 9 Post-docs. Ongoing supervision: 28 PhD students; 41 Master's degree students; 23 Undergraduate students and 2 Post-docs. Besides, 63 national and international academic events were organized in different Brazilian regions.
3. See National Curriculum Orientations for Secondary Schools - Foreign Languages (Orientações Curriculares para o Ensino Médio-Línguas Estrangeiras - OCEM-LE), published by the Brazilian Ministry of Education /Secretariat of Basic Education in 2006. Based on the third generation view of literacies embedded in the new literacies /Multiliteracies theories and practices, the National Curriculum Orientations focuses on the cultural, political and linguistic values of languages, allied to the educational objectives of languages learning in schools /for life. Access: http://portal.mec.gov.br/seb/arquivos/pdf/book_volume_01_internet.pdf

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12

Improving Multimodal Literacy through *Learning by Design*

Mary Neville

In writing this chapter, I have made a note of two questions the reader might ask of its title:

- *How does Learning by Design support the teaching and learning of a broader set of literacies for 21st century learners?*
- *How does Learning by Design value-add to a teacher's instructional practice and student learning?*

This subject matter is illustrated throughout the chapter with vignettes and curriculum samples from the Queensland Learning by Design Project over two consecutive years. It concerns groups of teachers who taught classes ranging from Grades 1–12 as they came together to learn about, plan with and share outcomes of their classroom applications of Learning by Design. The examples explored are taken from the first and second years of the project. The first year involved collaboration with teachers from local primary and secondary schools who applied the principles of Learning by Design in forward planning and ongoing practice. Examples of two teachers' practice from the second year of the project drill down into these teachers' own professional learning, planning and teaching, and their students' results as they used the Learning by Design tools and processes to assist them in multimodal literacy teaching and learning. I have written this chapter for practitioners and educators interested in learning more about how the Learning by Design framework can be used to translate Multiliteracies theory into practice. In short, it addresses the impact of the pedagogical framework on teachers' practice.

Background

Teachers who have been teaching for more than 15 years will confirm that their role in designing and delivering curriculum has expanded considerably since the Internet and other ICTs have influenced teaching and learning in the classroom. Compared to 15 years ago, teachers now plan, and teach curriculum using digital software and technological platforms to design, house

and deliver the intended curriculum for their classes. Furthermore, in the case of literacy, new digital media environments offer different forms of text, networked communication and multimedia composition which necessitate the development of evolving ICT and multiple mode design capabilities (multimodal literacy) in conjunction with proficiency in reading and writing traditional print texts. Therefore, students must now be taught how to read, view, write and create multimodal texts. These require new navigation concepts, comprehension and design skills alongside highly valued, customary literate indicators for improving reading and writing practices in schools. This added complexity for teaching in the 21st century was the catalyst for professional development project work in Queensland (Queensland Government, 2000, 2001, 2002) and my classroom-based research on the practical use of *Learning by Design* as a pedagogical framework for teaching multimodal literacy. When the *Learning by Design* project began a decade ago, 'Multiliteracies' (New London Group, 2000) was central to professional development on literacy in Queensland. The concept of 'Multiliteracies' was created to extend many educators' views of literacy being singularly associated with the written word and one standard use of the English language. The New London Group claim that Multiliteracies is:

a word we chose because it describes two important arguments we might have with the emerging cultural, institutional, and global order. The first argument engages with the multiplicity of communications channels and media; the second with the increasing salience of cultural and linguistic diversity. (New London Group, 2000, p. 5)

Conceptualising what students needed to learn about Multiliteracies was a task the New London Group (2000) claimed required a new set of grammars. This anticipated need led to the description of the patterns of representation in the linguistic and cultural demands of context-specific texts and the design elements or meaning-making systems present in the texts of our real-world lives. It was claimed that a metalanguage for these grammars would help students to explain differences in the use of oral and written language, and the visual, audio, gestural and spatial design elements in everyday communication as they appear by themselves or in combination, in other words, multimodal form (Cope & Kalantzis, 2000; Kress, 2000).

Multiliteracies and *Learning by Design*

Opportunities for professional development that relate to the teaching of multimodal literacy have been made widely available in Queensland over the last 15 years, and schools continue to provide action learning projects for teachers in a variety of ways. The *Learning by Design* Project, which is the subject of this chapter, was initiated as a part of this professional

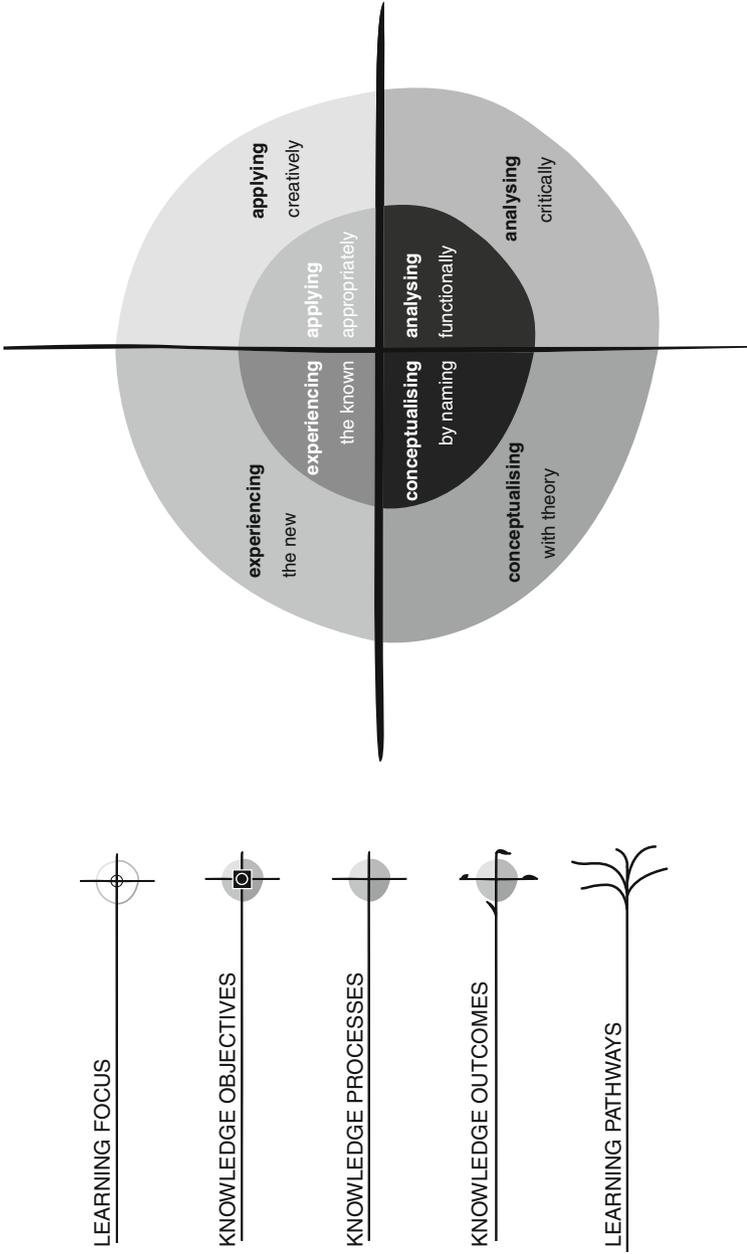


Figure 12.1 Learning Module overview and knowledge processes

development emphasis, with the specific aim of introducing Multiliteracies theory into everyday classroom practices. Whilst *Learning by Design* is an approach to pedagogy and classroom program design applicable right across the curriculum, the focal point for using the *Learning by Design* approach in this project was specifically in the area of literacy, and in particular to bring the broader view of literacy to classrooms that Multiliteracies embodies.

The main innovation in this project has been the *Learning by Design* pedagogical framework, as described by Kalantzis and Cope earlier in this book. The *Learning by Design* digital curriculum-planning tool (Learning Module) was an object of study, as the teachers employed the knowledge processes of experiencing, conceptualising, analysing and applying, as seen in Figure 12.1, to document their curriculum and pedagogy, as well as implement it in the classroom.

The Learning by Design project in Queensland

Year 1 of the project

Engaging teachers in a new course of professional learning is often dependent on how well what is offered to them captures their current needs, attention and enthusiasm. Many of the teachers became involved because they perceived the project as a professional learning opportunity to expand their knowledge of Multiliteracies and as a means to apply this new knowledge. They were aware that there was a strong commitment to Multiliteracies led by the education department and their principals. In addition, some teachers commented on the connection between the project and the need to match teaching practices with the everyday lives of today's children. One teacher, working in a hospital school, was particularly articulate about meeting this need:

... certainly, working more on hybrid texts as opposed to the traditional genre structure, I mean that's the real world, that's where kids are living these days. So they need to be able to decode that, access the meaning and deconstruct it, and they need the skills and the strategies to do that. I mean even living within the hospital environment; it is a multi-modal environment. Living in the school environment is a multi-modal environment so they need to be able to access that and get meaning from it.

Meredith, Mater Hospital Special School, Ward Teacher.

Others pointed out that their professional learning from involvement in the project might also help them to support other teachers in their schools through the additional roles they held – enrichment coordinators, Middle Schooling Head of Department, literacy and curriculum coordinators and membership on literacy and ICT committees.

The profiles of teachers' work contexts were substantially different, spanning three districts with culturally diverse student populations – one school

had students from 48 different cultural backgrounds. While just over a quarter of the schools were situated in highly affluent suburbs, the remainder of schools were in mid- to low-socio-economic locations. Primary classes that were taught during this project covered Grades 1–7. There was evidence that prior to the *Learning by Design* project teachers planned their curriculum and classroom activities drawing on a wide range of theories and frameworks. The way these teachers chose to document units of work, the pedagogy and the planning templates or tools they used to plan curriculum were distinctly varied and not necessarily well focused on the new kinds of text and textual practice identified by the concept of Multiliteracies.

The seven secondary teachers taught English, Studies of Society and the Environment, Languages, Information Technology and Visual Art to Grades 8–12 students, or combinations of these subjects. Two secondary teachers were working in a New Basics (future focused curriculum dimensions, including Multiliteracies) trial school which meant that subject boundaries were already blurred, while the other secondary teachers were planning to or had experienced the idea of combining knowledge from multiple disciplines.

The professional learning accounts from the first year of the project are drawn from interviews with teachers and an analysis of many of their previous curriculum planning artefacts and their Learning Modules from the project. In essence, teachers' work in this project focused on moving from existing and varied curriculum planning practices to new ways of thinking about teaching and learning Multiliteracies and documenting that for a wider audience.

The two main differences between previous planning documents and the planning evidenced in the *Learning by Design* Learning Modules that teachers produced during the project relate to audience and pedagogy. First, in writing the Learning Modules, teachers were authoring curriculum designs for a wider online audience including students, and were aware that greater attention to detail was required. Second, the Learning Modules themselves explicitly detailed pedagogy at a micro level because teachers had an in-depth planning template and resource book to guide them. Using the pedagogical description of alternative knowledge processes provided by the *Learning by Design* framework, teachers specifically tagged their Learning Modules to show which knowledge processes were being used to support students' learning throughout the sequence of the unit of work. As a consequence, the newly created Learning Modules were mindfully detailed and sequenced to capture different ways of knowing. These Learning Modules explicitly outlined micro teaching, learning and assessment of experiential, conceptual, analytical and applied knowledge. Project teachers specified how new knowledge could be acquired through specific pedagogy in teacher and student language using the four knowledge processes existing in the *Learning by Design* pedagogical framework.

The teachers were also mindful of much broader pedagogical objectives, so that students using the learning designs would not only be able to feel a sense of belonging in the curriculum (engagement with their interests and identities) but also, through connecting new knowledge to known knowledge, gradually be transformed by the curriculum. There was evidence that the previous curriculum planning approaches used by many of the project teachers reflected only a macro overview of a curriculum framework or unit for a term – what students will know and do. However, while the newly-authored Learning Modules were also able to state what students would know and do, the teachers found that they were in fact creating another layer of curriculum design which detailed how students would learn and be transformed.

At the initial *Learning by Design* professional development days, teachers were also asked to reflect on their views about the future of schooling. A common response was that education is constantly changing, becoming more student-centred, problem-based and creative. A focus of this reflection on being a teacher these days was that it required a considerable amount of self-transformation – they referred to changing teaching styles, having to keep up-to-date with ICTs, as well as the new texts of the new communications media. The teachers agreed that today's children and the environments they grow up in are worlds apart from their own childhood experiences. The changing nature of the way children spend their leisure time often involves the use of new technologies which are superseded very quickly. They play online games with global friends, use online chat rooms, text message, view global multimedia productions and have access to instant global news, information, movies and music via the Internet and television. Many children today are motivated by the need to acquire new skills and knowledge as they negotiate different and sometimes virtual social situations and new, constantly advancing technological experiences with their friends. This means that traditional, teacher-directed pedagogy and a generic content approach to learning are having less and less traction. This, in part, is what drew these teachers to the notion of the Multiliteracies project and the expectation that Multiliteracies theory and practice would help them to be able to cater for the individual needs of the diverse students in their classrooms.

The Queensland *Learning by Design* project aims were to:

- support a group of teachers to adopt pedagogical practices based on the theory of Multiliteracies
- offer and encourage multimodal expressions of meaning and communication in the learning process: linguistic, visual, audio, gestural and spatial
- experiment with the *Learning by Design* curriculum documentation and pedagogical template
- develop exemplars of the Multiliteracies approach for primary and secondary classes to support wider use in schools.

Mid-way through the project, a point where teachers had already begun to develop their teaching and learning plans, they were asked about their experiences of using the pedagogical framework, and the digital template in which the Learning Module scaffold had been presented to them:

A lot of the teaching is not that different from what I would do normally; the only difference is that it is of a different order and I am giving things different names, making my teaching tighter. I feel that the way it (the Learning Module template) is organised is quite logical and it's interesting to be bringing in the two perspectives – the teacher and student side – as well. *Melissa.*

I think it is extremely useful to have a framework to bring the many facets together and to work out where they all fit. I find it difficult at times to remember the big picture when immersed in a small part of the learning and *vice versa.* *Alison.*

Well to me it's a natural progression; it's a sensible framework it could be applied in any sort of knowledge base or learning situation. *Meredith.*

In other words, teachers found that the Learning Module template reflected the way they worked already, adding at times some new insights – situating specific learning activities into a larger learning plan, introducing some pedagogical concepts identifying the components of the learning process, prompting them to tighten up that learning process, and highlighting the contrasts and crossovers between the professional discourse of teaching, and classroom or learner discourse.

The following example of a Learning Module from a teacher in the first year of the project demonstrates how the learning process had a transformative effect on students from diverse cultural and linguistic backgrounds. Teresa Anderson, the teacher who developed, taught and wrote up this Learning Module, spoke on several occasions throughout the project about how many of these students were at risk of falling behind state and national literacy benchmarks and had difficulty relating to the formalities of school life. As a result of her reflective curriculum design and as a consequence in part of her professional learning in the *Learning by Design* project, the young students in her class began to emerge as engaged and committed learners. They tackled a real-life problem in the Brisbane environment – the problem of children being bitten by insects in the playground at lunchtime and sightings of (potentially deadly) red-back and white tail spiders and wasp nests. Some insects looked large and threatening, but were harmless; others seemed small and inoffensive, but in fact were quite dangerous. In the children's minds, these insects posed a potential threat to their safety at school.

This Learning Module began with the student's experiential knowledge – the apparent problem of insects at their school – and proceeded toward improving the level of all students' literacy, with a focus on Multiliteracies (Figure 12.2).

Is there a problem insect population in our school grounds?

Based on the Learning Module, 'Insects: Friend or Foe?' by Teresa Anderson for a Grade 2 class at Stafford State Primary School, Brisbane.

Knowledge Objectives

As a result of completing this Learning Module, students will be able to understand:

Experiencing

- the types of insects that live in the school grounds
- the types of insects that live in the local area
- new facts about insects through research from digital resources

Conceptualising

- characteristics of insects and their lifecycles
- grammars of moving images: script, character, backdrop, set, colour, light, movement, sound effects, gesture
- grammars of text organisation for multimodal information report: headings, labelled diagram, key words, visual placement of images

Analysing

- how to inquire and draw conclusions about insects and their degree of harmfulness
- the purpose of a multimodal information report
- the target audience for insect display and expo
- the functions of digital technologies

Applying

- movie making (create a stop motion clay animation movie)
- representation of a life cycle
- presentation of an information report through PowerPoint
- presentation to an audience

Figure 12.2 Knowledge objectives in Teresa Anderson's learning module

Example 1

This summary shows how the teacher mindfully considered the variety of 'knowledge processes' that would create an engaging and effective learning environment, as well as introducing key Multiliteracies concepts and practices. The class decided the best way to tackle this insect problem was to find out more about them and then to present their new knowledge to the school community. They also decided that the presentation about the school insect population would take the form of a multimedia information exhibition. The class then had to work together cooperatively to achieve this goal through a variety and range of texts and old and new technologies.

The teacher used the knowledge processes to harness the diverse life experiences of students in her class. This was achieved by affording students opportunities to experience, conceptualise, analyse and apply knowledge of insects while using multimodal texts that were appropriate to the discipline of science and, in the case of a formally written report about insects, also to meet traditional literacy goals. She achieved this because the learning was closely connected to her students' everyday lifeworlds, interests and concerns.

For instance, all children were given choices about the insect they would research and how they would share information with the school community. Some took the opportunity to speak and present PowerPoint slides at the school assembly; others made safety instruction cards for teachers'

playground duty bags detailing what to do if a child was bitten by a dangerous insect; still others recorded their information report on cassette and designed the cassette title covers. Another group of students became engaged in designing posters with flaps that required readers to lift them in order to locate the insect information underneath. Digital photos were taken by the children of the school insect species and cross-checked insect identification in science books before inserting the photos into PowerPoint presentations. All children (and many of their parents) were interested in making a clay animation movie about an insect fact. This major activity brought children and their parents together as many children pleaded with parents to come to the classroom on a regular basis to see the work evolve.

The final community insect exhibition – attended by well over 100 people – was planned and organised by the class. Children self-identified their roles in this exhibition which included presenters, caterers, hosts, invitation and program designers, and those children who were willing to use their design skills to set up the display. Comments from parents and other community members who attended the exhibition were glowing. One community member said he had never seen anything like this event and was amazed at the confidence and engagement of the young students and the academic standard of the work produced.

After project completion, Teresa Anderson wrote and shared an impact statement about how the professional learning about Multiliteracies she received as a part of the *Learning by Design* project helped her professional work:

Enormously! I have received excellent professional development through being part of the project and it has taught me to reflect and make positive changes to my teaching. Most of the support was practical and not just theory so I could take action to get results, not simply make decisions.... I now understand more clearly the focus for literacy in the future and how it will complement my teaching.

This professional learning came at a wonderful time for me because I have quite a challenging Year Two class this year both academically and behaviourally. The Learning and Development Centre support helped guide me to make huge impacts in my classroom.... My own planning is now more thorough as I am thinking through my teaching steps and strategies. This in turn is reflected in my teaching and ultimately improved outcomes from the students.

Teresa also discussed the impact the *Learning by Design* pedagogical framework and extended knowledge about Multiliteracies and ICTs had on her students' basic literacy outcomes:

The improvement in interest, writing and reading ability in my class has been astounding. Half of my class was caught in the Year

Two Net (the state diagnostic assessment of literacy and numeracy in the second year of school at the time of this project) with an average Reading Recovery level of 6. The majority of them are now reading over level 20. My Year Two class also received over half of the school's lunch time red cards (breaking school rules) in Term One and this decreased to only one red card in Term Two, and very few for the rest of the year. The students wanted to come to school and not miss out on the interesting and connected work they were doing.

This case study indicates that the approach taken had the capacity to support improvements in basic literacy skills of a diverse range of students, as well as developing new capabilities and sensibilities – real-life problem solving, collaborative group work and improvements in multimodal literacy.

Outcomes of the project's first year

At the end of the first year of the project, all teachers made comments about the high levels of student engagement, including collaborative engagement in each other's work. A revealing and common response by teachers to the question 'In what ways did this project have an impact on student learning?' was increased student engagement and higher quality knowledge outputs.

One day my principal was visiting my classroom and she was overwhelmed at the students' standard of work and their ability to explain how they were tackling their group tasks. She was astounded - actually in tears because she was so used to dealing with the constant behaviour issues of certain children and wasn't expecting to find these same children so engaged and working cooperatively in groups to apply their new knowledge. *Alison, during the presentation of her Learning Module at the final project review.*

All students belonged in this lesson today – especially the walk around the school to observe the native flora which existed in the local area long before settlement. In the group work you could see the engagement of learners and listen to their talk. It was all about their learning. *Researcher's observations of Alison's class in her reflective journal.*

Other teachers also commented that skills improved all round, such as cooperative learning, group work, metalanguages for reading and skills associated with producing multimodal texts and the use of ICTs. A group of teachers in a focus group discussion also noted that through engaging with the activities in the Learning Modules students learned that there were many ways to communicate their ideas.

Your Learning Module picked up a wide variety of literacies and modes of communications – this was a rich task in so many ways. *Peer review feedback to Rachel about her Learning Module presentation.*

The following comments relate to how individual teachers catered for their student's diversity and learning. Responses are to questions: 'How well has the teacher built on the diverse life experiences to create improved student learning outcomes?' and 'How well have the learning experiences been designed and selected?'

'This was superb at catering for diversity.'

'You involved the school community to "hook" students into the work – gave them an authentic context.'

'High student engagement! You found out where students were. Use of what was happening in the world around the students led to obviously highly intense discussions as a good base to the development of a take-home message for the student's documentary.'

'Students well engaged through knowledge that relates closely to their experience.'

'Students obviously loved it!'

'A strong sense of design and design sensibility that has engaged with the kids in a powerful way.' *Project teachers at project review.*

Year 2 of the project

As a consequence of the success of the first year of the project, I decided to research, in more depth, two middle years' teachers' curriculum planning and teaching to ascertain in what ways the *Learning by Design* pedagogical framework facilitated teaching and learning about multimodal literacy and the subsequent improvement in students' work (Neville, 2008). This involved an analysis of the teachers' curriculum-planning artefacts before and after the *Learning by Design* project, classroom observations, professional learning artefacts, semi-structured interviews, audio recordings and the collection of student work samples. For both teachers (named Teachers A and B in this chapter due to ethical research agreements), these accounts were surprisingly similar in terms of the high impact on professional practice and student learning. Specifically, the data revealed how the *Learning by Design* pedagogical framework facilitated quality digital/multimodal student literacy practices (see Table 12.1), as well as demonstrated a set of five professional practice dimensions (see Table 12.2) which supported quality teaching and learning in this project.

The two middle-years teachers taught in upper primary and lower secondary contexts. Teacher A taught a Studies of Society curriculum unit on democracy to their Grade 6/7 class and Teacher B (a secondary visual arts teacher) taught a visual arts unit on multimodal collage making to visiting Grade 4/5 students from a local primary school as a lead-up to

the production of a short film on humanitarianism in media studies. The findings in this second year of the project illustrate the significant professional practice requirements (Darling Hammond, 1998; Thompson & Zeuli, 1999; Desimone, 2009) the teachers had in using the *Learning by Design* theory and ideas to provide intellectually stimulating multimodal literacy learning experiences for the benefit of their students' improved literate outcomes.

Teacher A

As part of the *Learning by Design* project focusing on multimodal literacy, Teacher A decided to incorporate the making of a documentary film by students to demonstrate their learning on the Australian justice systems. This teacher initially spent time personally investigating new learning on how to proceed with teaching students how to produce a documentary film. Teacher A consulted with a friend, who volunteered to help the class make their video documentary. As a semi-retired documentary maker with considerable experience in the field, he possessed the equipment and practical knowledge of the elements that constitute the production of a documentary. He agreed to come in at different times the following term to help the class reach their goal.

The transformative action of getting a message about Australian justice systems across on film, as opposed to a familiar written or verbal account, was going to take a greater productive and creative effort on the part of both Teacher A and the students in the class. In fact, Teacher A eventually decided that it was impossible to do both simultaneously and decided not to write up the Learning Module prior to the production of the documentary. A decision was made that this would be written up when the various workshops on documentary making were being given to the class. In other words, the Learning Module was not going to be fully planned before the unit on the Australian justice systems was taught. The expert's technical language was, therefore, incorporated retrospectively and the multimodal aspects, grammar of moving film and associated metalanguage were introduced into the learning experiences in the Learning Module during the deployment phase rather than as an element of preplanning. This was seen as a positive and more productive step by Teacher A, who was prepared to build on an expert's knowledge in a reflective planning process rather than deploy an anticipatory set of learning experiences based on only a limited knowledge of documentary film making. At the end of the project Teacher A referred to the planning process in the project impact statement in the following way:

After some time researching the theory of filmmaking, I contacted a distant friend, Peter (pseudonym) who had begun his professional life as a

teacher and ended up producing documentaries for a living. He kindly offered to speak with my students and took an interest in the project. With his involvement, my focus shifted right away from theoretical learning in books and I abandoned the rudimentary planning I had made in order to follow his lead. After all, he had successfully made his living from this work over the last 25 years, so I felt very comfortable in using his practical guidance. However, this had implications for the way I used the *Learning by Design* approach. I began to use it retrospectively, to write up each process as Peter guided us through it. I am sure this is not the approach that was intended by the authors, but as Peter conducted numerous workshops with the kids and moved them, and me, through a very manageable process for preparing for this film, I feel I learnt much, and in a very valuable way.

This explanation suggested Teacher A had decided gaining the discourse of film making was more valuable for professional learning than ‘theoretical learning in books’ and ‘rudimentary planning’. It also demonstrated that the drive to produce quality outputs outweighed the process to the extent that the Learning Module couldn’t be finished on time and, therefore, needed to be documented retrospectively. Admission was made that a personal lack of knowledge about making a documentary film had made it impossible to explicate this in the *Learning by Design* template prior to the teaching phase.

Teacher B

Coming to the project as a Master of Education post-graduate student, with previous experience at a New Basics school and high level skills in visual literacy as a qualified and experienced secondary school visual arts teacher, it was apparent that Teacher B already had a strong knowledge base on which to build new professional learning on Multiliteracies. This knowledge allowed prior connections to be made between the visual art curriculum and the multimodality aspect of Multiliteracies. Teacher B aimed to deploy Multiliteracies in classroom practice not only to highlight the significant existence of multimodality in the visual arts, but also to facilitate its transfer by students into other subject areas such as media studies.

The rationale behind the visual literacy component is threefold. The first and most holistic is to equip individuals with the necessary knowledge and metalanguage to decode and make meaning of the constructed environment in which we live. This is based on the premise that anything constructed is a product of art and design. A knowledge of visual literacy therefore equips the individual to be critical and transformative rather than a passive consumer. Secondly, a knowledge of visual literacy is

transferable from subject to subject and project to project made manifest through a variety of visual genres. Visual literacy provides the basis for developing a personal aesthetic and for understanding and responding to aesthetic across cultures. Thirdly and more specifically to this unit, visual literacy development provides the language and experience core to the discourses required for students to create a mixed media collage. This collage is to communicate a humanitarian issue. Ultimately the knowledge of visual literacy and the concept of humanitarianism will be transferred to create a short film. *Teacher C in a written reflection of their Learning Module.*

This following example of a Learning Module from Teacher B in the second year of the project demonstrates how the learning objectives were planned under the *Learning by Design* knowledge processes for students.

Multimodality is central in Figure 12.3 and is evident in Teacher B's application of all four knowledge processes. This display captures the broad range of knowledge processes Teacher B used in planning, as is demonstrated in the summary of the knowledge covered. Figure 12.3 also demonstrates Teacher B's ability to articulate *Learning by Design* theory with a high level of abstraction or 'high road transfer' (Thompson & Zeuli, 1999).

Knowledge Objectives

As a result of completing this Learning Module, students will be able to:

Experiencing

- Appreciate that art is a tool for communication
- Apply their own experiences and frames of reference as a starting point for any art work
- Communicate a point of view through a developing visual literacy
- Distinguish between and appreciate the qualities of both expressive mark making and compositional devices

Conceptualising

- Communicate using visual art vocabulary
- Follow a design process which involves:
 - (A) Researching ideas, materials and techniques
 - (B) Develop preliminary sketches with written annotations
 - (C) Resolve one of these ideas
 - (D) Evaluate final work

Analysing

- Deconstruct the visual components of an art work
- Justify interpretations made about an art work based on the visual cues of line, shape, colour, size, placement, juxtaposition, imagery, focal point, and mark making

Applying

- Develop a mixed media/collage to be incorporated into their film. This will be in the form of a still shot. The art works will be designed with the film's genre in mind e.g. news report; documentary; dramatic re-enactment etc.

Figure 12.3 Knowledge objectives in Teacher B's learning module

Summary of the professional practice of Teacher's A and B

The following tables represent a summary of the analysis of Teacher A's and B's use of the *Learning by Design* materials and the dimensions of their professional practice that value added to their instructional practice for multimodal literacy.

The potential of the *Learning by Design* pedagogical curriculum-planning tool – the Learning Module template – as an approach to documenting and implementing digital/multimodal teaching and learning is displayed in Table 12.1. The tool has shown that it can capture the tacit knowledge of experts in effective examples of pedagogy and multimodal learning, as in the cases of Teacher A's film production and Teacher B's visual arts collage production Learning Modules.

The strengths of the tool's potential displayed in Table 12.1 resided firstly in its versatility. In this project, the tool proved to be able to be used as a curriculum-planning tool to prompt and document appropriate pedagogical choices for Teacher B's previously unrecorded professional knowledge (this point is related to the teacher's previous curriculum-planning artefacts) about multimodal literacy teaching and learning within the visual arts. In contrast to Teacher B, Teacher A's use of the tool proved that it could be used as a heuristic to document the teaching and learning central to the documentary film production as a reflective practice after implementation.

Table 12.1 Potential of *Learning by Design* curriculum planning e-learning tool

Teacher	How the <i>Learning by Design</i> pedagogical approach facilitated digital/multimodal literacy	Strengths of <i>Learning by Design</i> materials to facilitate digital/multimodal literacy
A	Facilitated the conscious documentation of the pedagogical variations for the discourse of film production. Facilitated a broad range of pedagogical variations and rich dialogue. Intellectual work of students increased. No traces of previously preferred language based framework in planning.	Can be used reflectively to document rich learning post teaching phase.
B	Facilitated the documentation of a Learning Module about creating a multimodal collage. Pedagogy was broad and enabled students to produce sophisticated texts.	It is possible and not onerous to capture rich pedagogy when teachers commit to higher intellectual engagement about learning the new terminology and the discourse of social practice if not already known to the teacher.

The second strength to emerge out of the findings related to the potential of the tool was that it facilitated a broad range of pedagogical variations and rich dialogue for teachers and students surrounding the production of sophisticated digital and/or multimodal texts. In the cases of Teachers A and B, the depth of pedagogical variations was reported by each teacher to have supported the convergence of previously disparate literacy teaching practices (visual literacy and critical literacy) into a more 'purposeful intent', as well as 'scaffolding action in the middle years' in the form of collaboratively produced, intellectually rigorous multimodal texts. At the end of the project, Teacher A spoke of *Learning by Design's* facility to support digital/multimodal literacy as setting up a more authentic learning environment:

Using the *Learning by Design* materials provided me with a new way of considering the teaching of literacy. I acquired a new repertoire of language, or rather, new dimensions of meaning for terms I already knew. I found this challenging. My involvement in this project really cemented my understanding of what is meant by the term 'Multiliteracies' and forced me to embrace all the challenges that are implied by it. This project allowed me to focus previously disparate competencies in my teaching of literacy – for example, critical literacy, visual literacy – into a more unified and purposeful intent. In this way, the learning context felt less contrived and more authentic.

This last point steers the discussion to the findings on broadening professional practice (Table 12.2), in particular the dimensions of professional practice that were evident in the analysis of the teachers' involvement in the project.

Firstly, one of the dimensions of the professional practice findings suggests that when the teachers used existing expertise or acquired new found expertise in digital/multimodal text production, it affected the way they organised the classroom for learning (see Table 12.2). Teacher B had the creative production space for students to construct their multimodal collages within the art classroom. The furniture and resources for production were able to accommodate collaborative workspaces for intellectual engagement of multimodality to occur. This allowed dedicated time to be devoted to production learning activities. In Teacher A's case, the impact of an expert filmmaker's master classes changed the classroom organisation into more open collaborative workspaces. Desks and the blackboard were discarded for open-plan and circular meeting spaces where students could develop a new intellectual relationship with their teacher – who was a co-learner with them in the production of a documentary film. Thus, the classroom space became a meeting place for a team of engaged apprentices learning from a master of film-making.

Table 12.2 Dimensions of professional practice in teaching multimodal literacy

	Teacher A	Teacher B
Professional practice		
Classroom organisation	<p>Created new production spaces for learning about multimodal literacy.</p> <p>Dedicated time devoted to film production.</p> <p>Collaborative group work.</p> <p>New relationships with students – teachers as co-learner.</p> <p><i>A focus on digital media textual production leading to a documentary on Australian justice systems.</i></p> <p><i>Using available designs</i></p> <p>Experiential knowledge</p> <p>about texts on the Redfern Riots (Indigenous justice issues) and documentary film-making.</p> <p><i>Designing</i></p> <p>Predominantly production pedagogy.</p> <p>Metallanguage of documentary film production.</p> <p>Theorising the multimodal design elements of documentary film production.</p> <p>Analysing the potential impact of film and choices about ‘take-home messages’.</p> <p><i>The Redesigned</i></p> <p>Applying conceptual and analytical multimodal knowledge to newly designed film.</p>	<p>Art room production furniture.</p> <p>Collaborative group work.</p> <p>Dedicated time devoted to collage production.</p> <p><i>A focus on multimodal textual production leading to a short film on humanitarianism.</i></p> <p><i>Using available designs</i></p> <p>Experiential knowledge about artists’ use of artistic devices to portray meaning.</p> <p><i>Designing</i></p> <p>Predominantly production pedagogy.</p> <p>Conceptual knowledge about artistic devices and metallanguage.</p> <p>Theorising about how to combine images, colour, lines, texture and print.</p> <p>Analysing functions and interests in collage production using a humanitarian theme.</p> <p><i>The Redesigned</i></p> <p>Applying deep conceptual and analytical knowledge to newly designed collage.</p>

Impact on personal and student learning	Personal learning was reported to be high in terms of the meaning of Multiliteracies and combining aspects of literacy pedagogy which were previously disparate. Identified sophisticated intellectual student learning outcomes.	Substantiated student learning through annotations of student work samples. Identified sophisticated multimodal literacy practices in students' work.
Understanding of <i>Learning by Design</i> theory and ideas	Pedagogical tags were confusing at first. Difficulty understanding the meaning of the knowledge processes. Initial attempts were to list a sequence of activities then tag them later. No evidence of sustained use of <i>Learning by Design guide</i> . Required collaborative help to use knowledge processes. Increased understanding of multimodality and diversity. Documented a record of me multimodal literacy learning after implementation. No traces of former language-based 'genre' framework in final draft of Learning Module. <i>Learning by Design</i> could accurately document the pedagogical variations. Effective Multiliteracies approach. Discourse of social practice evident.	Substantiated professional learning through links to the theory and ideas of <i>Learning by Design</i> pedagogical choices in relation to productive pedagogies. Evidence of use of <i>Learning by Design</i> guide in Master of Education assignment. Understood me knowledge processes. Did not require collaborative help to document me pedagogy onto the Learning Module template.
Transfer of theory and ideas		Wrote an assignment at Master of Education level about professional practice using the <i>Learning by Design</i> approach. Effective Multiliteracies approach.

Secondly, Table 12.2 illustrates that the impacts of the use of the *Learning by Design* approach to pedagogy (using the Learning Module curriculum-planning tool) on teacher and student learning were highly successful in two cases. Both Teacher A's and Teacher B's planning, teaching and professional learning experiences in the project had an impact on their own and their students' learning. In both cases, the teachers reported students as having produced sophisticated digital/multimodal texts with high intellectual engagement. The metalanguage, deep understanding and deep knowledge associated with Teacher A's students' production of a video documentary and Teacher B's students' multimodal collages – documented under conceptual and analytical knowledge processes – are consistent with the domain of intellectual quality within the 'productive pedagogies' framework (Queensland Government, 2001). This intellectual depth was also substantiated in audio-taped lesson transcripts, where the expertise of the discourse of the social practices (documentary film-making and visual arts productions) and a deeper understanding of *Learning by Design* to transform students' lifeworlds was observed and recorded. As Teachers A and B observed:

My students and I really enjoyed being involved in this project. It gave them a context in which to engage, intellectually, with some really higher-order thinking. It gave them a sense of purpose and focus – a way of channelling their collaborative intellectual efforts into a single and fairly complex intent. It was stimulating for us all, not only because of the nature of the content, but also because it required new skills and competencies. The students loved the filming days and learning how to use the camera and sound equipment. My favourite part of the process was in the editing suite – watching the students quickly become very competent in using the editing software, listening to their decision-making about the text they were creating, considering alternatives, watching it all come together, playing it back and feeling the impact of our decisions, watching how the students reacted. When we had our world premiere in front of our small audience of parents, the students were justifiably proud of their film and the parents were vocal in their praise of the students' efforts. I felt quite emotional. I think part of that was a degree of frustration – watching a film is one thing, but the audience doesn't really gain an insight into the students' intellectual growth that I see, and value so much, as their teacher. It's hard to put all that into words – you have to be there and listen to their conversations and appreciate the complexity of how these 11- and 12-year-old students were thinking and behaving.

(Teacher A)

The structure of the *Learning by Design* framework is such that the problem is posed from the onset and the scaffolding of knowledge processes directs one to a solution. This particular Learning Module has a strong focus on active citizenship as the goal of the project is to enlighten

community perception about humanitarian issues, thereby transforming how people respond to such an issue on a daily basis. Critical and reflective thinking skills have been integral to this process ... The journey into visual literacy took students on a journey into the unfamiliar, away from their comfort zone. It was, however, through the explicit criteria that the learner knew the expectation, the direction to where they were destined, and the road to be taken. This is not, however, a single lifeworld destination. What they didn't know was the specific details of the things they would encounter along the way. What they did know was that it was important to venture into the unknown, and that such risk taking was both safe and to be encouraged.

(Teacher B)

A review of the repertoire of multimodal literacy practices (in Table 12.2) that students were engaged in throughout the Learning Modules indicates Teacher A's and Teacher B's strong emphasis on pedagogy for the production of multimodal texts (production-instructive pedagogy). In both cases, the pedagogical emphases in the multimodal text-design cycle determined the repertoire of multimodal literacy practices that students engaged in. Multimodal text-production pedagogy incorporating field-specific (for example, documentary film-making, graphic design, visual arts teaching) multimodal literacy expertise within conceptual and analytical knowledge processes, accounts for some of the reasons why the intellectual depth was evident in students' final products.

Conditions for *Learning by Design* to support teacher and student learning

The generated accounts of Teacher A's and Teacher B's successful deployment of *Learning by Design* to facilitate quality digital/multimodal literacy outcomes makes available indicators of successful professional practice. These indicators are highly suggestive of effective professional practice and provide a description of the conditions that allowed successful digital/multimodal literacy teaching and learning to prevail during the project.

The research in the second year of the project demonstrated the existence of five conditions necessary for the *Learning by Design* framework to be effective as a heuristic to enhance multimodal literacy outcomes:

- The existence of deep **field-specific literacy** knowledge.
- The provision of **dedicated time** for professional learning and a willingness to engage with research breakthroughs and new knowledge.
- The desire and facility to select from, and document explicitly, a **broad range of knowledge processes** and the degree to which pedagogical designs can shift from experiential learning to conceptual and analytical processes.

- The capacity to enable a ‘**production house**’ classroom environment.
- The orientation to a ‘**collaborative production**’ approach to designing learning and engaging learners.

Conclusion

At the end of this two-year project, the *Learning by Design* classroom application in Queensland might be evaluated as a project that captured the needs and enthusiasm of teachers as designers of quality learning. A further defining feature of the project is that the teachers and students were reflective and engaged learners. The project aimed to provide in-depth professional learning for teachers in order for them to translate aspects of the state literacy strategy into authentic practice. Teachers’ explorations with the *Learning by Design* pedagogical framework and materials provided them with a way to consider their existing teaching practices, engage with the various knowledge processes and mindfully design learning experiences for a diverse range of 21st century students, incorporate multimodal texts and document all this using the Learning Module template. *Learning by Design* promoted reflective pedagogical practices and provided teachers with self-generated feedback on how they were implementing state literacy and pedagogical reform agendas.

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13

Digital Lifeworlds and Designers of Literacy Practices in Malaysian Schools

Ambigapathy Pandian and Shanthi Balraj Baboo

This chapter looks at literacy practices in secondary schools with a focus on teachers as designers who will be able to transform learning in Malaysia. Reflecting on some of the challenges faced by teachers, this chapter presents two case studies on English and Science Literacy that were adopted in the Malaysian classroom setting. A collaborative effort between school teachers and researchers led to the design of a set of modules that can enhance teaching and learning in schools. The discussion describes the works of teachers in building new pedagogical practices and multimodal skills. It describes and provides new kinds of relationships to be built among the community of teachers, researchers and students that aligned with new developments in their digital lifeworlds.

Introduction

'Digital Malaysia' is a national transformational policy that aims to support the use of new technologies to propel the country's economic and social growth towards a developed digital economy by 2020. One of the key areas of focus of this plan is to nurture a new generation of information and communication technology-savvy youth who will be able to create participatory opportunities and encourage innovation in domestic and global markets. The proliferation of technology has been accompanied by controversy, highlighting risks as well as opportunities, and irresponsible as well as sensible behaviour in the ways young learners acquire knowledge and share their experiences with one another (Baboo, 2013). The Digital Malaysia plan has also seen a focus on literacy at the top of the education agenda. Many literacy researchers, scholars and policy-makers have come forward with different ideas on re-imagining and re-shaping what it means to be literate and to conduct daily life activities in society and the economy in present and future times (Ministry of Education, 2012).

Like many other countries, Malaysia is mindful of the priorities needed to improve literacy practices. Literacy research over the past decade reveal that the learning conventions in schools concentrate on print, pens, pencils,

paper and books, while in out-of-school practices students encounter a wide variety of information and communication technologies including web browsers, e-mail, Facebook, You Tube, Temple Run, Candy Crush, avatars and virtual worlds (Pandian, 2004; Dzulkifli, 2012; Baboo et al., 2013). Social network sites, online games, video-sharing sites and gadgets such as iPods, iPads and mobile phones have become important fixtures in students' everyday lives. These fixtures offer new, varied and interactive ways to communicate, learn and play and form connections with other individuals with whom they can relate and share current experiences. The pathways of literacy in the students' digital lifeworlds clearly demand that we re-examine the practices of literacy in schools to enable children to engage with learning activities in creative and productive ways (Pandian & Baboo, 2011; Indra Devi, 2014).

Literacy scholars in Malaysia have conducted academic research and dialogue in the light of the movements in new globalized living settings and new technologies. They have sought to develop action plans that respond to the literacy needs of individuals and communities in multilingual, multicultural and multimodal environments (Latisha & Mahani, 2009; Koo & Hazita, 2010; Fong, 2012; Pandian et al., 2013). The educational alliance established between Malaysian and international literacy scholars like Bill Cope, Mary Kalantzis, Peter Kell, Gunther Kress, Courtney Cazden and James Paul Gee saw the beginning of a journey that shared matters relating to critical pedagogy attentive to the changing face of social, political, economic and technological dimensions of contemporary societies. We were particularly attracted to Cope and Kalantzis's (2000) work on Multiliteracies and the later project, *Learning by Design*. This project extended the Multiliteracies concepts of Situated Practice, Overt Instruction, Critical Framing and Transformed Practice to core knowledge processes of experiencing, conceptualizing, analyzing and applying (Kalantzis & Cope, 2005). Intrigued by their intellectual framework and proposal to transform conventional learning settings to more relevant learning environments that are appropriate to the changing world, we sought to adopt the *Learning by Design* model in the Malaysian cultural context.

This chapter delves into the pedagogy advanced by Cope and Kalantzis, which prompted us to engage in critical problems surrounding literacy practices in Malaysian classrooms. The Multiliteracies framework required careful deliberation to enable us to appropriate it into the intricate diversity of teaching settings in Malaysia. We present in this chapter insights into our endeavour with a community of secondary school Science and English teachers who attempted to transform traditional practices of teaching. The first part of the chapter presents the complicated literacy landscape laced with the emergence of new communication technologies and multi-channelled learning environments and the diversities in communities, languages, cultures and ways of life. Together, these call for shifts in reading,

thinking, writing and speaking practices. This is followed by a discussion of the intervention strategy taken by the project team to advance the agenda of *Learning by Design*, and the outcomes of this collaborative inquiry and intervention in enhancing literacy in secondary schools. This chapter shares ideas from our project experiences to inspire teachers to embrace a more critical role in better preparing students for living and learning in an increasingly connected and vibrant world in the coming years.

The Malaysian literacy setting

In Malaysia, literacy practices are deemed to take place principally in the classroom. Home, religious institutions, media and other cultural realms play overlapping 'spheres of influence' that impinge upon students' learning endeavours (Boivin et al., 2014). There is a paucity of research examining literacy practices prior to school age. However, powerful factors are at play here that sculpt the literate futures of young people. Research in the past few decades has largely focused on formal classrooms and has highlighted gaps between school experiences and real-world life experiences confronting students (Pandian et al., 2013). In addition, teacher-centred styles, exam-oriented classrooms, and mostly text-based materials that advance rote and memory-based learning have been highlighted as barriers to an education that can stimulate critical thinking, creativity, and caring in all learners (Fauziah & Nita, 2002; Normazidah et al., 2012).

A number of literacy research projects conducted by the author and co-researchers have revealed that the actual implementation of literacy programs has been fraught with difficulties at classroom levels. Teachers want guidance with communicative language teaching, computer-based teaching, material development and classroom management (Pandian et al., 2012). Teachers generally agree that they are more interested in interactive learning activities compared to traditional methods of learning. However, when asked if they would concentrate on more ICT-based learning methodologies rather than on traditional methods of learning (textbook learning), a significant proportion of them were not sure if they would do so. The main difficulties of teaching English literacy, according to the teachers in the studies, include teaching methods, developing activities for writing, listening and speaking, and designing exercises that enable students to use grammar correctly. The research findings suggest that new and transformative literacy initiatives will not occur unless teachers themselves feel the need for such a transformation. (Pandian, 2004, 2006a)

In the case of Science literacy, the research findings reveal that students find the delivery of the subject syllabus too theory-based, with insufficient practical work in the laboratory. They feel that they are learning Science just for examinations, and not for gaining new knowledge or information. Students observe that the chalk-and-talk method of science learning is

dominant in classrooms. They rarely go on science excursions or field trips (Pandian et al., 2012).

In another vein, literacy in higher education is also fraught with difficulties. The low employability among school leavers and university graduates and poor language and communication skills further points to a mismatch between what is taught in the universities and what is required in the realism of personal, workplace and public life. Studies by Morshidi et al. (2012), Norizan et al. (2007) and Zuraidah et al. (2006) suggested that the learning programs of most Malaysian universities offer little of direct relevance to workplace realities. The research reports that graduates, employers and government officers agree university curricula should be revamped to better address employability needs of the 21st century. Literacy scholars have, at the same time, stressed the need to tread a careful path that will not only focus on the workplace, but also deliver the capacity for other domains of our lifeworlds like the spiritual, family and cultural (Pandian, 2006b; Rosniah, 2006; Koo, 2008).

We now confront different ideas, meanings, values and understandings of literacy which may vary from one cultural context to the other. Factors like culture, religion, levels of education, gender, life experience and household income can bring about variations in the way we interpret social ideas and practices on literacy. Literacy educators encounter complex facets of cultural and linguistic diversity as well as competing discourses to improve literacy opportunities for students in Malaysia (Pandian et al., 2013).

It is clear that there are various pressures influencing the domains of school, work, home and public life in Malaysia. The country recognizes the economic value of producing students who command good communication skills in English and who are able to participate productively in local and global activities. Numerous projects and action plans on literacy are being carried out in urban and rural areas at different levels to better understand the changes that are taking place in the nature of literacy and literacy instruction (Pandian et al., 2013).

It is important to observe here that a new National Education Blueprint was launched in Malaysia in 2013 to actualize the Government's aspiration to raise education standards and prepare students for the needs of the 21st century (Ministry of Education, 2012). The core belief here is that Malaysia needs to mould young people who are knowledgeable, critical, creative and competent to be global players who will then drive economic and social growth. The National Education Blueprint (2013–2025) emphasized that the professional roles of teachers have to be systemically reinvented in terms of teaching-learning practices and classroom management in order to prepare learners for the knowledge era. The new digital lifestyle setting calls for dynamic interaction with new communication technologies as a means of communication and a source of access to information in the task of knowledge and wealth creation and dissemination (Nur Aliah, 2012).

There is much interest in projects that advocate Multiliteracies, 21st century literacies, multimodality, pluriliteracies, Information literacies, Visual literacies, *Learning by Design* and Higher Order Thinking Skills as a means of wayfinding in the Malaysian literacy agenda. Numerous researchers have appropriated Multiliteracies models fruitfully in designing classroom literacy practices (Ajayi, 2010; Pandian & Baboo, 2010; Boivin et al., 2014;). At the same time, some resistance has also emerged as Multiliteracies is perceived as Western-based thinking that neglects students socio-cultural practices and cultures of learning (Fariza et al., 2015). There is some confusion on the underlying tenets of Multiliteracies and the de-construction of ideas that are labelled as 'Western', as well as understanding on classroom management among some scholars. Nonetheless, as argued by Singh et al. (2002), banking on the pessimistic perspective will only entrench contemporary communities in economic and cultural passivity. There is also a need to be more forthcoming to the opportunities presented by globalization and Multiliteracies so that Malaysia can re-construct the literacy journey in the coming years.

Appropriating multiliteracies and *Learning by Design* in Malaysia

Cope and Kalantzis (2000) use the term Multiliteracies to focus on the ways in which literacy education will transform and prepare students with skills necessary to be active and informed citizens in present and future societies. They advance the idea that we are designers, and that critical analysis and interpretation of the multiple modes of meaning can lead teachers and students to the 'design of social futures' (Cope & Kalantzis, 2000) in their working lives, public lives, and personal lives.

We were attracted to the Multiliteracies framework given its design strength, entailing a combination of knowledge processes, encompassing the four elements - experiencing, conceptualizing, analyzing and applying. Together, these stimulate critical and productive thinking. Given the diversities and complexities in different cultural contexts in Malaysia, the teacher plays a crucial role in assessing the knowledge and skills of students. Following the curriculum for the different levels of literacy by the Ministry of Education, the teacher explores specific classroom settings and learner experiences. The teacher discovers and defines a problem, ideates and develops curriculum materials, and also documents the validity of the lesson plans.

Subsequently, we pursued the Multiliteracies and its pedagogy by becoming part of the *Learning by Design* project led by Cope and Kalantzis in 2002. Our research engaged teachers as a vital factor in enhancing learning experiences in school. We were particularly interested in the critical role of the teacher, the pedagogy and the use of new technologies in designing of

lesson plans (Kalantzis et al., 2005). In this project, we worked on English literacy, witnessing a more meaningful approach evolving in the literacy practices in secondary schools. Following the success of English literacy in Malaysian secondary schools, we embarked on a second project on science literacy for secondary schools.

In February 2008, the project research members, based at Universiti Sains Malaysia, convened another meeting to discuss what was currently being done in science teaching and learning in secondary schools, and how the *Learning by Design* agenda could contribute to new methods of teaching and learning science in secondary schools. We linked up with the Ministry of Education and the state education departments to generate interest and discussion with teachers in order to understand some of the teaching conventions taking place in science classes. We began the project with a survey to ascertain the realities confronted in science classes. A total of 64 teachers from different parts of Malaysia participated in this study. The research team was interested in how teachers used the *Learning by Design* model and the teaching outcomes of this science literacy project.

The case-study of English literacy

The intense encounter with the *Learning by Design* model with Australian researchers led by Cope and Kalantzis and local researchers and secondary school teachers began in 2002. Both Cope and Kalantzis briefed the Malaysian teachers and researchers on the theoretical underpinnings of the Multiliteracies framework and the *Learning by Design* project. About 50 teachers from the northern region of Malaysia, including states like Penang, Kedah and Perak, attended workshops by the Multiliteracies scholars. While the Multiliteracies approach was welcomed with much enthusiasm from a majority of the teachers, many of them opted not to participate in the project given the administrative and academic demands of teachers in an examination-oriented curriculum at that time.

Nevertheless, there were several teachers who were totally excited and painstakingly followed through the different phases of the project. Parameswari Sarathie and Lee Bee Yong were two teachers from Perak who taught English to 14 year olds in a secondary school. Just like many public secondary schools who adhere to a centralized curriculum, they noted that their English class had specific dominant characteristics. There was a lot of learning by rote where students were required to memorize many facts, sentence structures and model answers. Both teachers and students were focused on scoring high marks for the examinations. The teacher-centred classroom did not provide much room for students' voices. The teacher was the authoritative figure and spoke while the students listened. There was hierarchy in the classroom and the teacher was seen as a powerful source of knowledge and skills.

Learning was based mainly on textbooks and workbooks. The teachers noted that their students had low levels of English proficiency, especially those coming from the rural areas. Moreover, many of the students learning English had negative attitudes towards English language learning. Speaking English was seen as supporting colonialism. The teachers, on the other hand, were highly motivated and bent on making their English lessons more meaningful. Despite coming from two different schools, Parameswari and Lee were interested in the Multiliteracies framework. They were looking to re-invent the English curriculum in their classrooms. They were very enthusiastic about the whole project and were keen to explore whether the learning theory could be applied in the Malaysian context. Parameswari and Lee designed learning materials about local experiences and lifeworlds present in their town and village for their English class. Given that the project was about local communities and a joint effort between two schools, the students were drawn to the new ideas and initiatives of the teachers.

On the part of the teachers, much struggle and hard work had to be confronted. Principals of schools were persuaded to support the project and permission from parents was sought to allow students to go on field trips. The collaborative work was an important outcome of the project that enhanced teacher professionalism, as the teachers were constantly sharing ideas and encouraging each another to deliberate on the knowledge processes and the supporting learning materials.

In this case, both Parameswari and Lee were concerned to get their students to learn more about their home and school surroundings by exploring Teluk Intan and a nearby fishing village, Kampung Sg. Liang in Perak. They were interested in using English literacy as a platform for discovering the diversities in their living areas. Both teachers were determined to promote understanding of the facilities and differences between the town and village life experience. The students were asked to locate information from books, actual real-life experience, photographs and the Internet. They were then asked to offer their views by way of PowerPoint presentations. This enabled students to engage with the diversities in social practices present in their communities and to deliver their thoughts and expressions using multi-modal forms and new technologies.

As shown in Figure 13.1, the model provides tools for documenting the richness of thoughts and activities of the teacher as a designer which can be used to guide learning for other learners. More crucially, the designs of teaching and learning of the town and the fishing village enabled the students from the surrounding areas to appreciate buildings landmarks and living cultures that they may have taken for granted or seen as insignificant.

Using the *Learning by Design* model, the teachers developed a list of activities and instructions. The activities included a visit to a fishing village and making a comparison of living and work cultures between the villagers

KNOWLEDGE OBJECTIVES	FINDING OUT
The Known	The New
As a result of completing this Learning Module, students will be able to: <ul style="list-style-type: none"> • Talk and exchange information about their town, obtain information about an unfamiliar environment and municipality. • Locate information from books, public library and the Internet. 	By doing this work you will learn about: <ul style="list-style-type: none"> • Your town and the village. • The facilities and differences between the town and the village. • Locate information from books, actual real-life experience, photographs and the Internet.
By Naming	With Theory
<ul style="list-style-type: none"> • Be able to use different sources to take notes: books, photographs, Internet, questionnaires and interviewing people. • Be able to use the power point. • Be able to use digital photographs as a source of teaching. 	By doing this work you will learn about: <ul style="list-style-type: none"> • The town and the village. • The facilities and differences between the town and the village.
Functionally	Critically
<ul style="list-style-type: none"> • Expressing opinions on life in the city and in the village using Power Point 	<ul style="list-style-type: none"> • The advantages and disadvantages of living in a town/ village. • The differences between living cultures in the town and the village.
Appropriately	Creatively
Draw plan of a dream town. <ul style="list-style-type: none"> • Create a model. 	By creating our library display, we will be able to: <ul style="list-style-type: none"> • Do research by taking notes and writing essays. • Use a digital camera. • Create a dream town.

Figure 13.1 Using knowledge processes in designing the English lesson

and the people from Teluk Intan town. Though the town was a setting familiar to the students, they enjoyed identifying the main landmarks and buildings that shaped the identity of the town. They had conversations with the town folk on the kinds of work being done and took photographs of different facets of town life. Following this, the students made a visit to a fishing village, Sg. Liang, and explored the differences in the physical and cultural living settings of the people. They explored the kinds of jobs and lifestyles of the villagers and jotted down their observations. The teachers encouraged their students to study the public amenities available in both the town and the fishing village. The students identified facilities like the bank, post office, public telephones, hospitals, schools, modes of transport, places of worship like the mosque and the temple that were important symbols in the cultures of the communities.

Next, they listed words and meanings associated with their experience of town life and village life. This glossary of words and the sense they made

with meanings and images revealed the different points of view of learners and the diverse ways the learners had framed town and village. For some, village life was seen as peaceful and calm while others preferred the hustle-bustle and excitement of town life. The students also had lots of fun as they prepared their work in posters in very attractive and creative ways, and these materials were displayed in the classroom.

After discussion of the student views on the differences in living in the city and living in the village, the teachers then asked the students to draft their plan of a dream town. Drawing from their observations, jottings and photographs they discussed the important buildings and facilities needed in a town. Again they dealt with a bit of design thinking in shaping the dream town. Working in groups, the students constructed models of their dream towns as seen in Figures 13.2 and 13.3.

Upon completing the unit, both the teachers and students felt that so much was accomplished and that the *Learning by Design* approach brought rich and meaningful teaching and learning experiences for them. Students found that the *Learning by Design* model and its pedagogical approach was most helpful as they learnt literacy in exciting new ways. More significantly, they were proud to be participants in this international project and proud that samples of their work and learning experiences were being published in books, journals and on the Internet.



Figure 13.2 Design of a model town by learners



Figure 13.3 Students construct their model town in a creative manner as part of the *Learning By Design* approach

The case-study of science literacy

The Malaysian government introduced English as the medium of instruction in science and mathematics in 2002 in order to ensure that Malaysian students are able to participate in activities in global socio-technical contexts. This generated much anxiety among the teachers, specifically the science teachers who had been trained to teach in the Malay language. This transition was fraught with many problems in the classroom and attracted much debate in the media. Following our exploratory work with English literacy using the *Learning by Design* model, we felt that we could engage teachers in a fruitful way to design learning materials for science learning in secondary schools. In 2008, we formed a new team of literacy researchers to pursue the Multiliteracies framework and to encourage teachers to produce more effective ways of offering science learning in the Malaysian setting.

Our first task was to locate and encourage teachers who were interested in initiating change in their pedagogical practices despite the constraints they were facing in their classroom contexts. We had science teachers who had been trained in the Malay language with little faith in their capacity to deliver science lessons in English, especially when many of them were not highly proficient in the English language.

The teachers who volunteered to be part of the project attended a focus-group discussion prior to the workshop on *Learning by Design*. The discussion began with an inquiry into teachers' views on initiating change in curriculum matters, as it was deemed important that we map out the structural and attitudinal realities confronted by teachers in schools. We also felt that it was important to appreciate teachers' voices and shared experiences in approaching and transforming science literacy in the local cultural context.

The main issues that emerged in the discussion were: (1) Teachers' present work was complex and demanding; (2) Teachers were confronting an examination-oriented curriculum with little room for innovation; and (3) Teachers needed assistance in English competence.

Teachers' present work was complex and demanding

The teachers noted that while they were interested in transforming pedagogical practices, much of this effort meant additional work and commitment. The teachers felt that their responsibilities were overwhelming. They were expected to do parenting work in the school setting, forming relationships with pupils, organizing learning and teaching, and managing students' behaviour in the classroom, as well as building student character through co-curricular activities. In addition, given the diversities in the school settings with students with different backgrounds, it was very challenging for teachers to address different abilities and language competencies in large classrooms. Teachers from rural areas had to confront problems like poverty, limited resources and poor school attendance. The idea of dedicating more time to writing and publishing modules frightened them, more so when many of them lacked confidence and had little belief that their work could make an impact on students' learning experiences. As in the earlier case study of English literacy, there were teachers who were passionate about their work and determined to initiate change and who proceeded to participate in the project.

Teachers were confronting an examination-oriented curriculum with little room for innovation

The chase for 'A' grades was a grim one where principals and school teachers were expected to deliver good academic results. With the overwhelming responsibilities, a crowded curriculum and a system which favoured rote-learning rather than understanding and thinking skills, the teachers were left with little choice but to resort to conventional methods of teaching. There was too much dependency on science textbooks. Students turned to memorizing facts since they could not comprehend them fully, and they could not experience common hands-on science investigations because of time constraints. The teachers further asserted that the 'exam-oriented education system offered little space for creativity and innovative instruction in the classrooms'. More crucially, there was a 'rush to complete the syllabus', thus the 'mass photocopying' of worksheets, notes and model answers.

Teachers needed assistance in English competence

It was difficult for many of the teachers to acknowledge the English proficiency factor. The teachers had mixed views about their abilities to use English to teach science. Many of the senior teachers were trained in the Malay language and had difficulties in delivering the lessons in English. Many of the teachers lacked confidence due to their limited proficiency in the English language and were uncertain about their capacity to design the learning modules and to publish them.

The research team felt that hearing the teachers' voices during the workshop was crucial as it unveiled the complexities in the school setting. The research team also took an important decision to include ten university English teachers from the School of Languages, Literacies and Translation, Universiti Sains Malaysia, to do collaborative writing with the teachers so that the learning modules could be published in English.

With the intention of implementing a more innovative and improved method of teaching and learning science, the process of creating modules based on the model of *Learning by Design* was initiated. The project aimed to enable teachers to be designers who would advance critical thinking and creative methods of learning science, as well as a means of improvising activity-based methods in the classroom. During the workshop, the teachers and project team members explored suggestions for creating more engaging lessons so that students would develop more interest in the subject. The teachers also considered ideas for experiments, field trips and investigative science projects. The school teachers worked in pairs and were still in charge of the subject syllabus and content, while the English-language teachers from the university helped to support the language aspects of the resource development. This move encouraged the teachers to venture into the module design and publishing activities of the project more confidently.

A total of 48 modules were developed. The topics included a range of lessons on the rainforest, colonization, the succession and conservation of mangrove swamps, the conservation of energy, water conservation, the greenhouse effect and global warming, the endangered ecosystem, practising the 3Rs (reduce, reuse, recycle), ozone depletion, environmental pollution, deforestation, 'visit a garden', eutrophication, force and pressure, the methods of controlling industrial waste disposal, air pollution, and the abiotic and biotic components of the environment. These topics were in line with the syllabus of the Ministry of Education.

A four-day workshop on Multiliteracies and the *Learning by Design* model was conducted where trained facilitators guided and aided the participants in their discussions on creating modules. In the next section we present a sample of selected activities from the collaborative work of the teachers in this project (see Figure 13.4). In the Learning Module entitled 'Environment Pollution', the teachers focus on developing students' scientific inquiry skills through stating the importance of safeguarding the environment

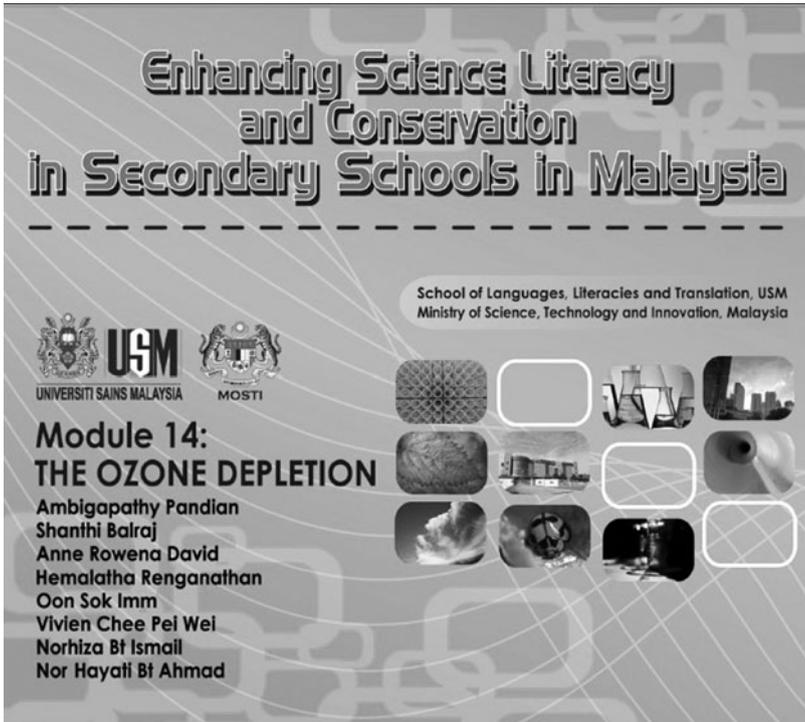


Figure 13.4 Using the *Learning by Design* approach in developing modules on Science Literacy

and identifying the substances that can be found in a polluted environment. Students are also encouraged to share their knowledge about the environment from books, the mass media, and their personal experience. In a Learning Module, teachers document learning objectives, the learning activities designed to meet these objectives under the headings of the knowledge processes, and assessment of the knowledge objectives. The different planned activities are clearly outlined at the beginning of the module to enable teachers and learners to connect teaching and learning to issues on environment pollution in imaginative and useful ways.

When the modules had been completed, the science teachers worked on the knowledge processes described in the modules to construct an engaging and effective learning environment, as well as to test the pedagogical effectiveness in real classroom situations. In a project based on 'Environmental Pollution', Module 11, one science teacher in one of the schools created multimedia presentations to show local pictures of environmental pollution and asked students if the environment was a concern to them and the ways it affected their health and lifestyles (see Figure 13.5).



Figure 13.5 A science teacher uses the knowledge processes of experiencing and conceptualizing in the classroom to engage students in group discussion and activities on local environment problems

The students talked about some of the rubbish disposal methods where certain people throw waste matter into rivers and parks. They noted that it was a common sight to see used plastic bottles and styrofoam packages left on canteen tables and chairs. Then, they participated in maze games to name and put concepts related to pollution like rubbish, fertilizer, pesticides, fossil, disposal, ozone, haze, smoke, acidic gas and soil. In group activities, using newspapers and the Internet, the students then looked for local case-studies of pollution to discuss the causes and effects. This process of analyzing functionally included the examining of knowledge surrounding the selected case study where the students assessed human behaviour and actions that contribute to environment problems. In one case study, the students offered explanations of why rivers were polluted with chemicals from nearby industries and rubbish from households, and how this in turn led to death of fish. The students then suggested actions that could be taken to raise the people's awareness and the need for local authorities to put in place strong enforcement.

Following this, the teacher then guided the students to draw flow charts to show the process of pollution. In the last activity, the students were asked to create healthy and environment friendly settings that would reduce environment pollution using recyclable materials. The model below shows a group of students work that called for caring for rivers (see Figure 13.6).

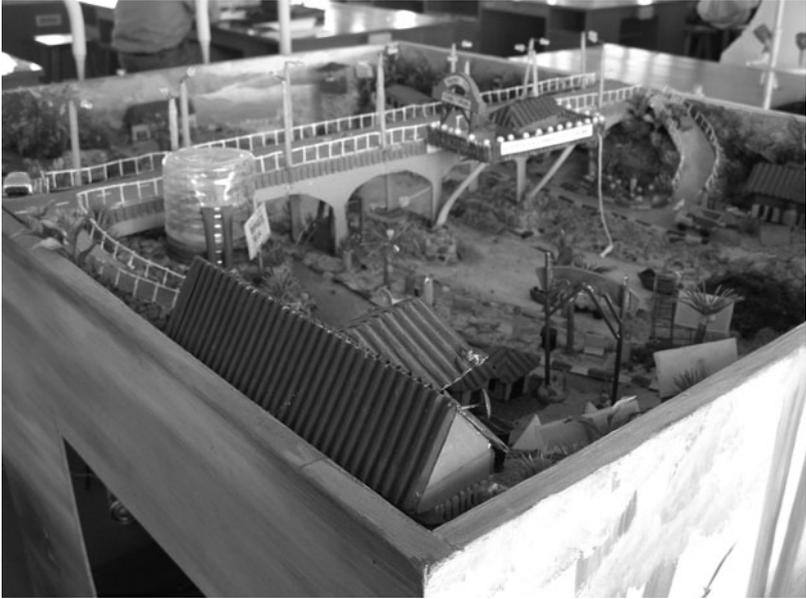


Figure 13.6 A sample of students' work on creating a healthy environment with clean road and water systems

In another school, the *Learning by Design* approach was used to nurture students to think about environmental awareness. Aiming to develop environment analysis and media creation skills among the students, the teachers in this project designed a number of activities that delved into students understanding on sustaining environmental preservation. The knowledge processes were used to enable the students to name an environment-related problem that they could deal with at the school level. The Learning Module included a media production project.

The students explored the school environment and named wastage of waste materials as a project to be conducted in the class. The students noted that there was a lack of awareness among their friends on the importance of managing and minimizing the amount of waste that we produce daily. The 3R concept – Reduce, Reuse and Recycle - was identified as the theme of the project. The teachers designed a number of activities that aimed to enhance students' knowledge on three concepts: Reduce, Reuse and Recycle in the Malaysian context by using local examples and experiences.

Using the framework of knowledge processes, the teachers developed activities for students to discuss their experiences on managing waste materials like paper, plastic bottles, old newspapers and magazines. In talking about reducing waste, the students gave examples of using cloth to wipe

spilled oil and dirt instead of using new kitchen tissues. They also said that lunch boxes were rarely used in schools and that this could reduce the use of paper and polystyrene plates and cups to pack meals and drinks. In talking about Reuse, the students said that they could reuse instead of just throwing away the plastic bags that they get when they buy things. Recycling involves the process of collecting and categorizing the type of waste according to the colour of the recycling bins, and the teachers developed activities on matching colours of bins for paper, plastic, glass and aluminium in Malaysia. At the end of the activities, the students noted that they all have important roles to play in caring for the environment, even though it may seem to make a small difference in their school community project on environment (Figure 13.7 and 13.8).

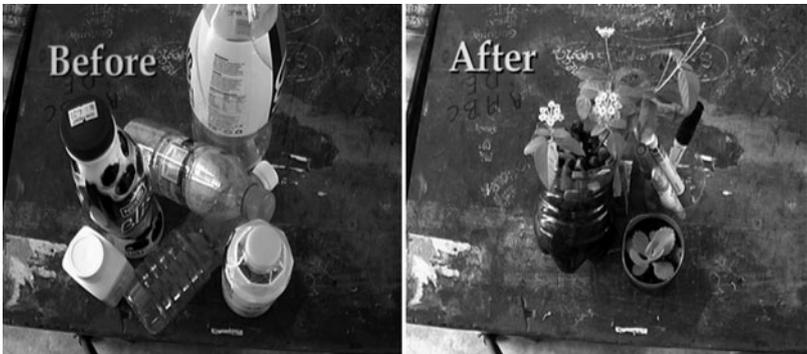


Figure 13.7 Students' works that include the recycling of plastic bottles to plastic pots for plants or pen holders



Figure 13.8 Students use old newspapers and papers to create multipurpose holders as part of their learning activities

In the final activity of the knowledge processes which involved applying creatively, the teachers designed the activity on the production of a short video which would allow students to assess and create visual messages. The teachers felt that it was important that the students were able to comprehend print materials as well as information made up of a fusion of sound, text, images and video.

The video production activity was one exercise that excited the students. The production team noted that that they should make a video that encouraged young people to practise recycling. This student group showed lot of interest in developing their idea; they tried to collect relevant information from the Internet and talked to their teachers to find out more about the topic. In general, they were found to be very hard working, and also they could work as a team efficiently by distributing the work among themselves. Also, the group members finished their assigned jobs in pre-production promptly before their shooting started (Figure 13.9 and 13.10).

Even though the group had a mix of boys and girls from various ethnic groups they all worked together nicely. The teachers were happy with the students' creative skills and in using their voice in persuading others to adopt environment-friendly behaviour. The activity designed in this module offered opportunities for collaborative teamwork among the students. It enabled the students to accomplish tasks related to visual thinking, planning, editing, performing and directing. A total of 12 videos on the environment were produced from different schools in Malaysia and these were uploaded on You Tube.



Figure 13.9 Students using the camera to make a short video production



Figure 13.10 Students learn acting and directing as creative skills

Issues for a working agenda for *Learning by Design*

Cope and Kalantzis's works on Multiliteracies and the project, *Learning by Design* advance profound thinking based on the opinion that every teacher and learner is capable of engaging the world in a meaningful manner with others. Their intellectual contribution is an important one as it intends to transform conventional learning settings present in our communities to more relevant learning environments that are more suitable to the changing world.

It is sometimes assumed that Western-based thinking and models in pedagogy can bring failures in culturally different contexts. Our works with the *Learning by Design* model are relevant when situated appropriately in the Malaysian context. We found the model strong on design where a combination of knowledge processes that encompasses experiencing, conceptualizing, analyzing and applying a productive pedagogy that enriched the quality of teaching and learning experiences of both teachers and students. While the students were excited about playing more active roles, there were times that their activities were deemed to be 'disruptive'. There was less order and neatness in students' learning cultures. Students were seen running in the school compounds with microphones, tripod stands for cameras, props and

lap tops. Sometimes they ran into technical problems with their PowerPoint and video production works and would check the staff room impatiently for teacher assistance. Some teachers and policy-makers may read these as unruly actions, but for us and the dedicated teachers who worked tirelessly in the project, it was a slice of the real meaningful world outside the school gates. Based on our experiences, we have listed below a few issues which we believe are essential ingredients in appropriating the *Learning by Design* model in the Malaysian cultural setting.

Support from the Malaysian ministry of education and other local authorities

The Malaysian education authorities are receptive to innovative approaches in teaching and learning practices that will enable students to confront challenges and carry out problem-solving activities in effective ways. Proper documentation of the works, and letters seeking approval and permission from different levels of education authorities are necessary to ensure the models are implemented smoothly. Some of the procedures may be time-consuming and it is important for researchers and literacy designers to establish a collaborative working culture that includes consistent forms of interaction and professionalism surrounding activities such as the preparation of project briefs, invitations to officials for participating in the *Learning by Design* workshops, field trips, joint problem solving sessions, data sharing and analysis and shared decision-making. The school principal is a key participant in ensuring the development of a collaborative culture, the use of high-quality professional development, and the successful implementation of *Learning by Design* activities.

Reports and outcomes of the *Learning by Design* project were sent to schools, the Ministry of Education and to the National Library. Education officials, principals, university officials and even parents were invited to screenings of student videos and to exhibitions of student science festivals. Teachers were given certificates of appreciation which were important for their professional development and assessment. The display of the Learning Modules, student scrapbooks, models and poster presentations were important in highlighting the output and the outcomes of the project. More importantly, the friendships we developed with state authorities, school principals and teachers unveiled higher levels of trust and respect among colleagues in building a collaborative culture for future ventures.

Caring teachers

Teaching is hard work and our position as researchers in this project offered us opportunities to witness the ways teachers as designers of literacy were able to transform the learning experiences of students in schools. The

teachers in the project who chose to complete all the tasks, such as participating in research interviews and discussions, workshops and designing literacy modules, had little knowledge about Multiliteracies and the *Learning by Design* model. Several teachers grappled with terms like Conceptualizing by Naming and Conceptualizing with Theory, Analyzing Functionally and Analyzing Creatively. But the caring teachers were not worried about the knowledge and skills required by the *Learning by Design* model; more importantly they had an open and positive attitude towards innovative approaches in their teaching subjects. Teachers must willingly open their classroom doors and work with, teach, and learn from others. Caring teachers are really keen on providing a high quality of teaching and have little fear of approaching new teaching strategies as advanced by the *Learning by Design* model.

Caring teachers are friendly toward their students and value their ideas and opinions. The teachers were good listeners and students knew that they could go to them with any problems or concerns. This was seen in numerous circumstances where students had difficulties with the organizing of science exhibitions and festivals, production works or in filming in certain areas of the school. They searched for their teachers in the canteen, in staff rooms and in school corridors to seek their advice and guidance.

Caring teachers have a strong conviction about their work as teachers in bringing changes in students' lives. Their role becomes critical to assess the knowledge and skills of students. Given the diversities in the student backgrounds, experience, and the tensions faced by students, the caring teacher is also a researcher who documents observations of students performance in the classroom to ensure that the learning activities become meaningful and relevant to their daily lives.

Available infrastructure and resources

There are many factors that contribute to effective teaching and learning experiences like the physical and technological infrastructure in a school. Well-equipped classrooms with adequate space for group work are important. Quite often the classrooms have large student numbers and limited facilities like computers, projectors and science apparatus. A school's technological infrastructure is important in meeting student needs if teachers are interested in using new communication technologies to advance multimodality and creative work. The emphasis on multimodality provides opportunities for making sense of images; however, teachers must also have the necessary knowledge and skills to facilitate this discussion. Only selected schools with good computer labs, laptops and cameras were able to generate video productions. Teachers must have the necessary production and other technological skills to guide students in developing narratives, as well as in completing the filming, editing and sound-mixing of the video productions.

Technicians are rare in school settings and teachers confront much difficulty in rendering technical assistance. Not surprisingly, some schools do not encourage the use of computer and science labs, as the issue of equipment maintenance needs more financial resources.

Time is another scarce resource in schools. One of the major challenges in advancing the *Learning by Design* model was time. The teachers noted the difficulty of developing activities and completing the Learning Module. This is where collaborative work among the teachers becomes important. In both the English and science literacy case-studies, the teachers had to prioritize the activities in their daily schedules and support each other by collaborative work. The teachers shared their tasks in selecting appropriate activities and preparing notes. The teachers clearly had no extra time, so they had to look for new ways to focus on the work at hand in the given time. In other words, rather than working individually, they shared their work through email with other teachers and used time in new ways.

Schools in rural and remote areas in Malaysia where electricity and Internet connection is unstable will face difficulty in developing learning activities that require new technologies. Teachers will have to think of other methods of introducing visual literacy through posters, calendars, pictures and photographs.

Supervising group work in the classroom

Group work was a popular strategy that was used for completing many tasks in the Learning Modules designed in our English and science literacy projects. Teachers had to be mindful when conducting group-based activities in the classroom as they had to consider the number of members in a group, the nature of the interaction between members in the group, and the type of learning task that was being undertaken. The group composition in terms of the ability of students, sex, ethnicity and religion are sensitive markers in the Malaysian cultural milieu that warrant serious attention. Teachers have to pay attention to language issues and cultural issues to ensure that every member has an important part to play in finishing the given task.

Managing student activities

Working on media productions, screenings and science exhibitions brings a lot of excitement and fun to students. While working on media productions, the students had to develop storyboards and scripts, and had to stay back after school for production meetings and filming schedules. It was important for teachers to notify the school authorities and seek letters of consent from parents so that the students could finish the given task.

Some of the ideas developed by students required informal dress in school, and it was essential for students adhere to suitable dress when filming video

and staging performances during the exhibition. Shorts, short skirts, spaghetti straps and sleeveless t-shirts are frowned upon in Malaysian school settings and it was important for teachers to guide students to think about their own conduct, social responsibility and ethics. Given that the videos were uploaded on You Tube and that there was press coverage of exhibitions and film screenings, it was critical that teachers and students were mindful of upholding the school's image.

Conclusion

The written text still forms the dominant form of communication mode in many Malaysian classrooms today. Yet, outside of school, the most influential and widely disseminated modes of communication and learning are visual. Currently, we are bombarded by colours, layout design, icons, graphics and many other visual symbols. Schools in Malaysia recognize the importance of reconstructing teaching and learning to make positive changes in preparing students for real-world struggles.

The Multiliteracies framework and the *Learning by Design* approach can be relevant when situated in the local context. Both the case studies presented in this chapter were appropriated successfully in the Malaysian cultural context as it engaged project participants from different local groups. In this case, upon seeking the support of principals of schools, as well as the Ministry of Education, teachers proceeded with the design of materials that were closely linked to learners' everyday living cultures. Not only were these materials authentic and relevant; they also engaged students as responsible citizens of the wider local community, developing a culture of professional knowledge-making and design-thinking. The *Learning by Design* model not only prompted new teaching and learning experiences. It also created a pool of teachers and researchers as designers to shape and form knowledge process that were relevant to the needs of Malaysian society. While the teaching of science in the English language had attracted a lot of controversy, the collaborative effort of science and English teachers designing and delivering learning modules addressed local concerns, while at the same time enhancing science literacy, language proficiency and the professional development of teachers. The case studies indicate an important juncture in innovating educational approaches in the Malaysian learning setting. Indeed, they marked a shift from the conventional approaches of classroom confined settings, teacher and textbook-centered methods as well as passive students' voices, to a platform where teachers are engaged in designing knowledge in critical and creative ways and students' voices can more clearly be heard.

The agency of teachers is a critical issue here. They need to be convinced of the potential benefits of bringing critical and creative perspectives to the learning contexts. Teachers were challenged by their involvement in these projects. The experiences of the teachers were a fraught mix of confusion,

hard work, difficulty, anxiety and enthusiasm. There were times when some were wary and weary, especially in relation to critical reflection and understanding of their classroom practices and the challenge of moving on to transformed practice. The teachers who participated in the project were brave and had a sense of responsibility to improve literacy. The framework offered to the teachers required them to readjust their thinking about classroom practices and instruction methods, as well as to appreciate the diverse talents of students.

For us, the voices of the project participants in both English and science literacy reflect the transformative potential of engaging in literacy research and intervention strategies as advanced by Multiliteracies and the *Learning by Design* model. We have experienced contesting of ideas and disagreements on pedagogical designs, as well as the excitement of having something to say that others value and that can inform the field. With concerted effort, action and sufficient resources, we believe that the Multiliteracies and *Learning by Design* perspective will mark the beginning of a learning process that will support our students to decode, make meaning, use and critically analyze multiple text types for multiple purposes in diverse contexts linked to their personal, school, work and civic lifeworlds.

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14

Examining the “Tools of the Trade”: A Knowledge Process Approach to Materials Analysis and Materials Evaluation

Luke Rowland

Textbooks, audio and video recordings, websites, and teacher-designed worksheets, tasks, and activities represent just some of the many “tools of the trade” for language and literacy teachers and learners. Teaching/learning materials such as these play a pivotal role in the classroom and thus deserve careful analysis and evaluation to ensure that they are engaging, supporting and inspiring learners to the fullest extent possible. One way to do this is to examine the materials for the knowledge processes – experiencing, analyzing, conceptualizing, applying – they anticipate. This chapter outlines a procedure for converting the Knowledge Process framework into materials analysis and evaluation instruments for use within any educational context where there is an interest in a Multiliteracies approach to language and literacy teaching and learning. It also presents a case for the use of knowledge process materials analyses/evaluations at institutions in which there is no intention of implementing Multiliteracies pedagogy.

Knowing is the process of connecting the stuff of the mind to the stuff of the world. Knowing is a form of action and to know in this active sense is to learn.

—Kalantzis, Cope & The Learning by Design Group,
2005, p. 70.

Introduction

Textbooks, audio and video recordings, websites, and teacher-designed worksheets, tasks, and activities – these constitute just some of the “tools of the trade” for language and literacy teachers and learners. Teaching/learning materials such as these perform a number of crucial functions in the language and literacy classroom. They mediate the underlying educational philosophy of a teacher or institution. They are a vehicle for the target language and content. They provide a basis for lesson structure and activity

sequencing. And at their best they engage, support and inspire learners. As central as they are then to the pedagogical process, it is clear that teaching/learning materials deserve careful analysis and evaluation to ensure that they are optimally contributing to language and literacy learning in any given educational context.

For teachers and institutions interested in applying a Multiliteracies approach to language and literacy pedagogy, *materials analysis* and *materials evaluation* are best carried out in accordance with Multiliteracies principles (see New London Group, 1996; Cope & Kalantzis, 2000; Kalantzis & Cope, 2012). Kalantzis, Cope and The Learning by Design Group (2005) have drawn upon such principles to create a form of literacy pedagogy called *Learning by Design*. As the cornerstone of this relatively new method of lesson planning and materials design, the *Knowledge Process* framework presents itself as an ideal candidate for repurposing as a specialized materials analysis or materials evaluation instrument. By assessing the ways in which various teaching materials anticipate and encourage the four knowledge processes – *experiencing*, *conceptualizing*, *analyzing*, *applying* – and by juxtaposing that information with their institution’s professed approach to language and literacy pedagogy, it is possible for teachers and materials developers to gain an overview of how well the macro and micro elements of their courses and programs align. This chapter outlines a procedure for converting the Knowledge Process framework into materials analysis and evaluation instruments for use within any educational context where there is an interest in a Multiliteracies approach to language and literacy teaching and learning. It also presents a case for the use of knowledge process materials analyses/evaluations at institutions in which there is no intention of implementing Multiliteracies pedagogy.

Materials development: analysis and evaluation

A considerable amount of language and literacy teachers’ work outside the classroom concerns the development and appraisal of teaching/learning materials. Tomlinson (2012) indicates the broad scope of this activity, stating that materials development “refers to all the processes made use of by practitioners who produce and/or use materials for language learning, including materials evaluation, their adaptation, design, production, exploitation and research” (p. 143). To ensure that the materials they are using are indeed meeting the needs of their students, whether these materials are professionally produced (for example, textbooks) or designed in-house by teachers or curriculum development groups, teachers are responsible for periodically analyzing and evaluating their teaching materials. Often this is done in an ad-hoc manner and quite subjectively, involving a cursory look at the cover, table of contents, or activities in a new book and a consideration of how the book might generally support the teacher’s pedagogical aims, for example.

This method, which McDonough, Shaw and Masuhara (2013) call an “external evaluation” (p. 53), is often appropriate and satisfactory for teachers with time and resource constraints and whose primary concern is the short-term goals and challenges of an individual class. However, when teachers or institutions desire more precise information about their materials for some reason or intend to analyze and evaluate teaching materials on a larger scale, for example when designing or updating whole courses which affect large numbers of students across multiple proficiency levels, then more detailed procedures for analysis and evaluation become necessary.

Materials analysis and materials evaluation are terms that are often used synonymously in the materials development literature. However, various scholars (for example Littlejohn, 2011; Tomlinson, 2012; McGrath, 2013) have distinguished the terms by highlighting their contrasting aims, which are seen to make them most applicable at different stages of the materials development process. As McGrath (2013) notes, the purpose of materials analysis is “descriptive-analytical rather than evaluative” (p. 53); it is a means to examine “materials ‘as they are’ ” (Littlejohn, 2011, p. 181) and “to understand what assumptions and beliefs lie beneath the surface and what effects can be anticipated” (McGrath, 2002, p. 22). Materials evaluation, on the other hand, “is a procedure that involves measuring the value (or potential value) of a set of learning materials” (Tomlinson, 2014, p. 15). The focus of materials evaluation is on the *uses* of materials and the materials’ effects, both intended and unintended, upon their *users* (i.e. teachers and students). While materials analysis considers the *implications* of materials then, materials evaluation assesses the *effectiveness* of materials. Considering these aims, it is understandable that materials analysis more often than not precedes materials evaluation in the materials development process.

Generally speaking, the procedures for both materials analysis and evaluation in language and literacy education involve the creation and application of criterion-referenced checklists which can be derived from various sources, such as a set of teacher beliefs; the principles of a particular pedagogical approach (for example, communicative language teaching); relevant research findings; or an institution’s educational ethos (see for example, Tomlinson & Masuhara, 2004; Masuhara et al., 2008; Rowland et al., 2014; Tomlinson, 2014). The checklist is then applied to a set of teaching materials by analysts/evaluators who, when working in groups, will often employ measures for enhancing the rigour of the procedure by, for example, including tests for inter-rater reliability.

While the process of materials analysis is frequently characterized as an objective practice in which analysts most often respond to *yes/no* questions (for example, *Is an answer sheet provided with the materials?*), materials evaluation typically presents evaluators with *to what extent* questions which require answers of varying degrees (for example, *To what extent does the material*

encourage student autonomy?). Whereas Harwood (2010) likens the process of materials analysis to the traditional research practices of qualitative and quantitative content analysis, Masuhara and Tomlinson (2010) explain that materials evaluation perhaps represents a divergence from accepted research paradigms because “however systematically conducted, [materials evaluation] is subjective” (p. 417). Table 14.1 summarizes the main differences between materials analysis and materials evaluation.

Nevertheless, very similar steps for actually carrying out materials analyses and materials evaluations can be found in the literature (see Masuhara et al., 2008; Harwood, 2010; Rowland et al., 2014; Tomlinson, 2014; see also Silverman, 2011 for a similar approach to traditional content analysis). The basic steps are:

- Form a group of analysts/evaluators if possible, rather than having an individual analyst/evaluator.
- Select a set of materials for review and decide upon a *unit of analysis*.
- Devise a criterion-referenced checklist based upon the reason for analysis or evaluation.
- Select a sub-set of the materials to trial the checklist for practicability, omissions, and/or bias. Make adjustments where necessary.
- Compare individual analysts/evaluators appraisals of the sub-set of materials to ensure an acceptable level of inter-rater reliability.
- Have the group members individually analyze/evaluate the complete set of materials.
- Perform statistical analyses of the data collected.
- Review the results of the analysis/evaluation with reference to the original purpose for analysis/evaluation.

These steps provide a general procedure for carrying out either materials analysis or evaluation. However, they can and should be adjusted to suit the specific purposes for materials analysis/evaluation at a given institution and any particular contextual constraints, related to personnel, resources and timeframes.

Table 14.1 Differences between materials analysis and materials evaluation

	Materials analysis	Materials evaluation
Aim	Descriptive-analytical	Interpretive-evaluative
Focus	The materials themselves	The uses and users of materials
Researcher stance	Objective	Subjective
Contextual sensitivity	Often context-light	Usually context-dependent
Checklist questions	Yes/no type	To what extent type

***Learning by Design* and the knowledge process framework**

In their 2005 volume, Mary Kalantzis, Bill Cope and colleagues (2005) introduced a practical approach to Multiliteracies pedagogy called *Learning by Design*. The idea behind *Learning by Design* is that new forms of pedagogy are necessary to prepare learners for the rapidly changing social, economic and technological orders effected by “new capitalism” (Gee, 2000), globalization, increasing migration, and the Internet. Kalantzis et al. explain that traditional instructional methodologies are struggling to address this:

... complex range of factors – among them, the changes in society and the economy; the potential for new forms of communication made possible by emerging technologies; and rising expectations amongst learners that education will maximise their potential for personal fulfilment, civic participation and access to work. (p. v)

The authors contend that to meet these challenges language and literacy pedagogy needs an overhaul. It needs to acknowledge the increasingly diverse nature of students, schools and societies. It needs to (critically) exploit new technologies which have superseded the importance of the printed page in people’s working lives. It needs to prepare students for staking a place in the “knowledge society” (Kalantzis et al., 2005, Chapter 2) by helping them to become knowledge-producers rather than merely knowledge-consumers. And most importantly, it needs to be deliberately and thoughtfully *designed* by language and literacy teachers to do all this.

Essentially, *Learning by Design* is a type of formal learning and it involves the conscious and explicit pedagogical moves that teachers (and learners) make to teach or learn a subject within institutional educational contexts, such as schools and universities. It is contrasted (but also connected) with the implicit, though still obviously vital, informal learning that happens in people’s everyday lives outside the classroom. At the core of both types of learning are the knowledge processes, which are described by Kalantzis and Cope (2012) as “epistemic moves, or things students can do to know” (p. 359) and which together form the Knowledge Process framework. What separates the two types of learning is that “informal learning occurs without conscious pedagogical design” (Kalantzis et al., 2005, p. 41), while formal education relies heavily on systematic, calculated methods of teaching and learning. In short, *Learning by Design* can be characterized as teachers’ and learners’ reasoned choices about which knowledge processes and sub-processes to engage at different times and for different purposes (see Table 14.2 for a breakdown of the knowledge processes and sub-processes).

Principled pedagogical choices between the knowledge processes are necessary at various times because each process involves a specific form of action best suited to achieving particular ends. *Experiencing* refers to people drawing

Table 14.2 A breakdown of the knowledge processes and sub-processes

Knowledge processes	Knowledge sub-processes	To understand lesson content, learners take the following meaning-making actions:
Experiencing	<i>the Known</i>	<ul style="list-style-type: none"> • Learners draw upon and articulate personal knowledge and familiar, lived experiences
	<i>the New</i>	<ul style="list-style-type: none"> • Learners immerse themselves in and reflect upon new situations and information
Conceptualizing	<i>by Naming</i>	<ul style="list-style-type: none"> • Learners abstract and define individual concepts from lesson content
	<i>with Theory</i>	<ul style="list-style-type: none"> • Learners map the relationships between concepts to achieve a schematic overview of a topic
Analyzing	<i>Functionally</i>	<ul style="list-style-type: none"> • Learners examine how ideas and information are used in the world outside the classroom
	<i>Critically</i>	<ul style="list-style-type: none"> • Learners account for the human perspectives, interests, and motives behind ideas and information
Applying	<i>Appropriately</i>	<ul style="list-style-type: none"> • Learners test their understandings of lesson content by producing something conventional
	<i>Creatively</i>	<ul style="list-style-type: none"> • Learners recombine the conventions they have studied to create something hybrid or transgressive

Source: Based upon Kalantzis et al., 2005, pp. 73–4 and Rowland et al., 2014, pp. 11–13.

upon familiar experiences or immersing themselves in new situations to increase their understanding of an idea or information. *Conceptualizing* is the development of abstract terms for ideas and the synthesis of these terms into a coherent schema to provide an overview of a topic. *Analyzing* is an action that breaks ideas and information down into their constitutive elements to examine how and why they function as they do. *Applying* is the act of testing one’s knowledge of a topic by producing something conventional or creating something entirely novel. When designing pedagogical tasks, materials, and courses, teachers should carefully consider the type of engagements they intend for learners to have with ideas and information at different stages of a lesson or course. This can then guide the teacher in making decisions about other important aspects of their teaching, including the most appropriate means of introducing lesson content to the class; possible lesson and activity sequences and timings; potential student interaction patterns; and suitable assessment, feedback, and evaluation procedures.

When *Learning by Design* is implemented in the language and literacy classroom, the dynamics between learners and *texts* becomes central. These dynamics are, in essence, the meaning making actions (i.e. knowledge processes) that learners bring to bear as they interrogate and assimilate the ideas,

discourses, and perspectives that texts convey. Kern (2008) explains the importance of this, stating that:

... texts – whether written, oral, visual, or audiovisual – offer more than something to talk about (that is, content for the sake of practicing language). They offer students the chance to position themselves in relation to distinct viewpoints and distinct cultures. They give students the chance to make connections between grammar, discourse, and meaning, between language and content, between language and culture, and between another culture and their own. (p. 380)

Of course, such texts represent an integral part of language and literacy teaching/learning materials and thus they deserve careful analysis and evaluation.

Using the knowledge process framework for materials analysis and evaluation

Kalantzis et al. (2005) explain that the knowledge processes are “not a sequence-to-be followed. They are not a pedagogy in the singular, but a kind of meta-pedagogy, a schema against which any possible pedagogy can be mapped” (p. 87). This makes the Knowledge Process framework an apposite tool for analyzing and evaluating existing language and literacy teaching/learning materials even if those materials have not been designed in accordance with *Learning by Design* principles. By subjecting materials to a knowledge process analysis/evaluation, teachers and institutions with an interest in Multiliteracies can perform a diagnostic assessment of their current language and literacy programs. As Rowland et al. (2014) posit, from a Multiliteracies standpoint, using:

... the [Knowledge Process] framework as an analytical, diagnostic lens can reveal which knowledge processes are being targeted by which materials, in what percentages, and whether inconsistencies or imbalances exist in the program as a whole or within various areas of the program. (p. 148)

With this kind of information, teachers or institutions can begin to remedy any obvious disparities between their professed method of language and literacy pedagogy and the actual forms of teaching and learning that their materials are encouraging.

The knowledge process framework for materials analysis

To perform a materials analysis using the Knowledge Process framework, the analysts should follow similar steps to those outlined above. After

selecting the materials for review, the analysts next need to determine the precise unit of analysis. Different studies present different ways of doing this. Littlejohn (2011), for example, although not referring to a knowledge process materials analysis specifically, provides a very thorough account of how to divide “materials into their constituent ‘tasks,’ and then to analyze each task in turn” (p. 188). The unit of analysis is thus the individual tasks represented within teaching/learning materials, which Littlejohn identifies by examining materials for changes in pedagogical processes, learner interaction patterns, and different content focuses. Similarly, Fterniati (2010) reports on a Multiliteracies materials analysis study of elementary school language arts textbooks in Greece in which she uses pedagogical *activity*, as well as text, as the units of analysis. Overall, the benefit of selecting task as the unit of analysis is that a very detailed breakdown of a set of materials can be achieved.

However, where the materials analysis is being performed to provide a broad overview of a large number of materials, then such a fine-grained analysis may not be warranted. Rowland et al. (2014), for instance, selected as the unit of analysis in their study the “*core meaning-making activity* represented by *an item of material overall* rather than the individual stages or tasks within an item of material” (p. 145; emphasis added). One objective of their analysis was to provide a summary of which knowledge processes were being anticipated by 167 items of EFL material at a Japanese university, and whether some knowledge processes were being favoured over others throughout a second-year language and literacy program. A “larger” unit of analysis facilitated the expedition of their materials analysis project while also providing a sufficient overview of the materials for their particular context and purposes.

With the unit of analysis defined, the analysts can create a criterion-referenced checklist based upon descriptions of the knowledge processes provided in Kalantzis et al. (2005) and Kalantzis and Cope (2012). As a materials analysis checklist, it should primarily feature *yes/no* questions; an example checklist is provided in Table 14.3. A further point to note is that when applying the checklist to the set of materials, the analysts need to decide whether the unit of analysis is to be categorized as mainly anticipating one knowledge sub-process or whether a task or item of material can be categorized as targeting multiple knowledge sub-processes. Once again, this will depend upon particular contextual constraints, the preferences of the analysts, and the specific purposes of the materials analysis.

Deciding which knowledge sub-process is being anticipated by a task or item of material can be achieved by looking for evidence in any instructions that are given on the material, in the activity structures and procedures indicated by the material, and in the objectives (both implicit and explicit) of the material. It is often obvious which knowledge sub-process is being targeted by a task or an item of material. For example, the book review in

Table 14.3 An example materials analysis checklist for language and literacy materials, derived from the Knowledge Process framework

Do the materials (or the tasks within the materials) (mainly) anticipate		Yes/No
Experiencing <i>the Known</i>	The articulation of personal knowledge and familiar, lived experiences?	
Experiencing <i>the New</i>	Immersion in and reflection upon new texts and information?	
Conceptualizing <i>by Naming</i>	Abstraction and definition of concepts?	
Conceptualizing <i>with Theory</i>	Mapping the relationships between concepts to achieve a schematic overview of a topic or text?	
Analyzing <i>Functionally</i>	The examination of how texts function in particular ways?	
Analyzing <i>Critically</i>	Accounting for the human perspectives, interests, and motives behind texts?	
Applying <i>Appropriately</i>	The production of something (such as a text) according to conventions studied in class?	
Applying <i>Creatively</i>	A recombination of conventions studied in class in order to create a hybrid or transgressive product?	

Source: Based upon Kalantzis et al., 2005, pp. 73–74 and Rowland et al., 2014, pp.11–13, 19.

Figure 14.1 (and, for that matter, perhaps all pedagogical book reviews) is clearly encouraging deeper learner engagement with a new text or new ideas within that text. Book reviews then can generally be categorized as anticipating the knowledge sub-process of *experiencing the new*, regardless of their different emphases (for example, whether a review of the plot, the characters, or the setting, etc.). However, occasionally different analysts will interpret materials in different ways. A group of analysts can increase the reliability of their analysis by firstly examining and discussing a trial set of materials to bring their interpretations into alignment. This will increase the likelihood of individual analysts categorizing units of analysis in similar ways during the materials analysis proper.

The knowledge process framework for materials evaluation

The same basic procedure for analyzing materials can be used when adapting the Knowledge Process framework for materials evaluation. Again, the materials and the evaluators would need to be selected, and the unit of analysis would need to be determined (see Ellis, 2011 for materials evaluations using task as the unit of analysis). One obvious difference between analysis and evaluation is that the evaluation checklist should feature *to what extent* questions and the evaluators should then rate the materials against the criteria on a multiple-point scale (for example, a five-point scale

Book Review	
Book title: _____	Author: _____
A Descriptive Paragraph	
<p>Where is your book set? What does this place look like? It might be a whole country, city, town, rural place or even just one building (e.g., a workplace or a house). Write one paragraph that describes the setting of your book in detail. If your book has many different settings, choose the setting that you think is the most important for the story. Some things that might be included are buildings, streets, nature, weather, colours, fashion, and so on.</p>	
<p style="text-align: center;">Name of the place : _____</p> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/>	

Figure 14.1 A sample item of material (book review) which anticipates *experiencing the new*

with 1 representing the least extent and 5 representing the greatest extent). The results of a knowledge process materials evaluation would indicate not only whether a particular knowledge sub-process is being encouraged or not, but the extent to which the materials are targeting it.

As mentioned earlier, a knowledge process materials evaluation would be a more subjective assessment than a straightforward analysis answering *yes/no* questions, but the results could be especially useful to teachers and institutions for purposes of comparison on a number of levels. For instance, comparisons could be made between:

- Different materials encouraging the same knowledge processes from within the evaluated set. An example line of inquiry might be: *When comparing these two items of material, what determines the difference in extent of encouragement of this particular knowledge sub-process?*
- Items of evaluated materials and items of material from other similar courses at an institution. An example line of inquiry might be: *Considering that these two language and literacy courses have similar goals and objectives, how similar are the different courses' materials in encouraging particular knowledge sub-processes? Why?*

- Entire language and literacy courses or programs. An example line of inquiry might be: *Do other language and literacy courses or programs feature a similar overall breakdown of materials encouraging the knowledge sub-processes to similar extents? Why/why not?*

An example checklist for evaluating materials according to the knowledge sub-processes they encourage is presented in Table 14.4.

A further major difference between analysis and evaluation is that whereas materials analysis generally occurs before materials are used in a lesson and indeed often as a method of selecting materials for classroom use, materials evaluation can and does occur at different stages of the materials development process. Furthermore, at each stage it may focus on evaluating entirely different aspects of the materials. Tomlinson (2011) explains that:

Evaluation can be *pre-use* and therefore focused on predictions of potential value. It can be *whilst-use* and therefore focused on awareness and

Table 14.4 An example materials evaluation checklist for language and literacy materials, derived from the Knowledge Process framework

To what extent do the materials (or the tasks) encourage learners to:						
Experience <i>the Known</i>	Articulate personal knowledge and familiar, lived experiences?	1	2	3	4	5
Experience <i>the New</i>	Immerse themselves in and reflect upon new texts and information?	1	2	3	4	5
Conceptualize <i>by Naming</i>	Abstract and define concepts?	1	2	3	4	5
Conceptualize <i>with Theory</i>	Map the relationships between concepts to achieve a schematic overview of a topic or text?	1	2	3	4	5
Analyze <i>Functionally</i>	Examine how texts function in particular ways?	1	2	3	4	5
Analyze <i>Critically</i>	Account for the human perspectives, interests, and motives behind texts?	1	2	3	4	5
Apply <i>Appropriately</i>	Produce something (such as a text) according to conventions studied in class?	1	2	3	4	5
Apply <i>Creatively</i>	Recombine conventions studied in class in order to create a hybrid or transgressive product?	1	2	3	4	5

description of what the learners are actually doing whilst the materials are being used. And it can also be *post-use* and therefore focused on evaluation of what happened as a result of using the materials. (p. xiv; emphasis added)

Clearly, pre-use evaluations would be similar to a materials analysis (as it has been defined in this chapter), although featuring different questions. The evaluators would be predicting the extent to which materials would encourage various knowledge sub-processes by envisioning the materials’ use in lessons. On the other hand, whilst-use and post-use evaluations would involve increased amounts of coordination, time, and resources on the part of the evaluation team as they performed ethnographic observations of the materials being used during lessons. However, such evaluations would likely produce excellent data with well-documented connections between specific items of materials, learners’ uses of said materials, and the particular knowledge sub-processes that the materials encourage the learners to engage in. Quite simply, the evaluators would have more evidence as to which meaning-making actions the learners were actually performing when interacting with the materials in class.

Conclusions

The Knowledge Process framework represents a powerful lens through which to analyze and evaluate teaching/learning materials. It is especially useful in educational contexts in which a Multiliteracies approach to language and literacy pedagogy is either being considered or implemented. This is because the Knowledge Process framework can be applied both as a *diagnostic tool*, to assess the current state of a set of materials and to identify which knowledge sub-processes are being anticipated by the materials, or as a *design tool*, to create new materials which target particular knowledge processes at particular times for particular reasons (i.e. the *Learning by Design* approach). However, it should be noted that it is certainly a specialized analysis/evaluation instrument, in that it is only really effective for examining the connections between materials and knowledge processes. The literature on materials analysis and evaluation, as discussed in this chapter, advocates the consideration of a multitude of factors for a complete assessment of the properties or value of a set of materials. These include, for example, how much choice learners are given when using the materials, how appropriate the materials are for a particular cultural context, or how accurately the materials reflect life outside the classroom, among many other factors.

With that said, there is considerable benefit in identifying which knowledge processes teaching/learning materials are targeting in language and literacy classrooms. According to Kalantzis and Cope (2012), each knowledge process is associated with a traditional form of literacy pedagogy. *Experiencing*

is at the heart of “authentic literacy pedagogy” (p. 95), a humanistic, process-oriented approach to teaching and learning, while *conceptualizing* is most important in *didactic literacy pedagogy*, which is more teacher-centred and rule-focused. *Analyzing* is tied to *critical literacy pedagogy*, in which education is viewed as a force for social change. Finally, *applying* is a mainstay of *functional literacy* approaches, such as genre theory and systemic functional linguistics. With this in mind, Rowland et al. (2014) explain that:

... even for institutions with no immediate plans to adopt a Multiliteracies approach, the use of the Knowledge Process framework for materials analysis [and evaluation] can reveal the pedagogical literacy tradition underpinning the courses they provide.... Such information is important because it can, for example, expose mismatches between an institution’s professed approach to literacy pedagogy and the actual materials and activities that are employed in the classroom.

If, for example, a teacher or institution espouses the importance of individual agency and subjectivity in the teaching/learning process (rather than, say, the requirement for learners to conform to a system or set of rules), one would expect to find materials and tasks that anticipate and encourage the knowledge process of *experiencing*, associated as it is with authentic literacy pedagogy and humanistic philosophies. A knowledge process materials analysis/evaluation is an excellent tool for determining if this is indeed the case, and if it is found not to be, the teacher or institution can set about remedying the situation by designing new materials that better suit their educational ethos.

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15

Engaging Learner Diversity through *Learning by Design*

Rita van Haren

Diversity is a key issue in education not only because of ongoing inequalities in student learning outcomes, but also because of the importance of supporting each individual to reach his/her potential to contribute to individual well-being, social cohesion and national economic prosperity. This chapter focuses on how the Learning by Design pedagogy addresses diversity in two Australian high school classrooms. Through interviews with students and teachers, and analysis of student work samples and teachers' learning designs, key factors that address diversity are identified. These include incorporating students' lifeworlds and their individual attributes in learning designs, scaffolding learning, creating student agency, including challenge and intellectual quality, and providing a meta-language for students to participate in their learning.

Diversity and *Learning by Design*

Increasing local diversity and globalization, the impact of technology and ongoing inequalities in the educational outcomes of students provide challenges for teachers. In Australia, performance by students on the Organisation for Economic Co-operation and Development's (OECD) Programme for International Student Assessment (PISA) indicates that students perform on a par with the best students in other high-achieving countries (Australian Council for Educational Research (ACER) and OECD, 2000; Thomson et al., 2003; Thomson & De Bortoli, 2008; Thomson et al., 2012). However, the results also highlight issues of diversity as socio-economic background and achievement are more strongly associated in Australia than other high achieving countries. In the Australian results there is a larger gap between the highest and lowest performing students. This underperformance by some students indicates that their needs are not being met through current educational practices and that education continues to work more effectively for some groups of students than for others.

Despite the rhetoric of educating students for the 21st century, many education systems, nationally and internationally, have responded to issues

of diversity in performance through back-to-basics approaches and universal standardized testing (US Department of Education, 2001; Australian Government Department of Education, Science and Training, 2006; UK Government Department of Education, 2010). The diversity of students is defined according to gross demographics such as gender, language, culture/ethnicity, ability/disability, religion, socio-economic background or geographic location, with government investment in programs which focus on, for example, students with disabilities or abilities, indigenous students, boys, students whose first language is not English and students from low socio-economic backgrounds. Many of these responses have resulted in widening rather than narrowing the gap between performing and underperforming students (Darling-Hammond, 2010; Ravitch, 2010; Tanner, 2013). Apple (2006) explains that such policies create differences and stratify even more powerfully by class and race. The perception is that because education is available to everyone, it must be equitable. When students underperform, the deficit is ascribed to them because they are seen to have missed or not taken the opportunities offered. Diversity in their experience is acknowledged primarily through educational practices that celebrate diversity and promote assimilation (Kalantzis & Harvey, 2003).

While gross demographics are very useful to generate population data about students, they do not recognize the complexity of difference; for example, the intersections of gross demographics such as class and gender or gender and race create even more variation. Nor do gross demographics support teachers to address the individual attributes of students. This requires teachers to plan teaching and learning experiences that value students' lifeworlds and subjectivities – their interests, experiences, abilities, insights, needs, cultural and ethnic backgrounds, physical and cognitive abilities, learning styles and intelligence. For most teachers, this would cause them anxiety as it would seem to increase their workloads – it is much easier to teach to the middle with a one-size-fits-all approach and require students to assimilate, making little or no allowance for students' individual lifeworlds and subjectivities. *Learning by Design* (Kalantzis & Cope, 2005; 2012a; 2012b) offers a pedagogical approach to teach at the individual level.

The *Learning by Design* framework was developed by Kalantzis and Cope (2005) based on the Multiliteracies principles of diversity, pedagogy and multimodality. They argue that curriculum and pedagogy must address diversity through the transformation rather than the assimilation or integration of the learner (Kalantzis & Cope, 2012a; 2012b). The framework focuses on recognizing and harnessing the individual attributes of students in teaching and learning. It thus requires teachers to purposefully deploy appropriate pedagogies and meaning-making modalities which are inclusive of the diverse needs and ways of knowing of their students.

Modern technologies require students to make meaning of a range of multi-modal texts, as well as become knowledge producers/creators. Technology may

increase the engagement of students in their learning, but its mere provision will not support the diversity of learners. Only with appropriate pedagogical support will all students be able to become knowledge producers/creators. Effective teachers with a repertoire of pedagogical practices and knowledge of which practices to select are critical to address the diversity of their students and to prepare them to be active citizens in a democratic society. Through its knowledge processes of experiencing, conceptualizing, analyzing and applying, the *Learning by Design* framework has the potential to transform classrooms and curriculums, and to improve student learning outcomes.

The research reported in this chapter is concerned with how *Learning by Design* supports a range of practices which address the diversity of students in the middle years of schooling where issues such as engagement and underperformance are particularly challenging. The research investigated student and teacher perspectives on the ways that this framework enables teachers to address diversity, and how this, in turn, impacts on the learning of students to enable them to achieve equivalent learning outcomes.

Research design

Using methods of ethnographic classroom research, the data involved a thematic analysis of the perspectives of teachers and students through semi-structured interviews (Minichiello et al., 1995; Burns, 2000), audio recordings, a student survey, teacher and student reflections, researcher journal reflections and field notes, teacher and student artefacts, and pedagogical strategies. It also included member checking and triangulation with assessment data.

Four students and two teachers participated in the research. Students were in year 8 (aged 14 years) and attended an Australian urban high school with a student population of 700. Approximately 33% of its students are identified as “low socio-economic” based on the Australian Bureau of Statistics’ Index of Relative Socio-Economic Disadvantage. Data from state standardized tests indicated many uneven patterns of success and school mean scores that were below the state mean scores.

The school had adopted *Learning by Design* as a pedagogical framework in 2004. The teachers in this research were teachers of English in the middle years. One participant was an experienced teacher, having taught for 27 years, who had been planning with *Learning by Design* for two years. The other participant was in her first year of teaching and it was her first experience of using the framework.

The students

The students were randomly selected based on gender and ability, judged by their performance in literacy in the state standardized tests and confirmed

Table 15.1 Student diversity in initial interviews

	Student male 1 (M1)	Student male 2 (M2)	Student female 1 (F1)	Student female 2 (F2)
Interests/ lifeworlds	Computers Football Music World issues	Skateboarding Pet dog Music Cars	Music Reading fantasy Netball Horse riding	Sport – especially skiing and basketball Music
Preferred multiple intelligences	Logical Linguistic	Intrapersonal Interpersonal Kinesthetic	Intrapersonal Kinesthetic	Kinesthetic Interpersonal
Academic performance	High – likes mathematics, reading and writing	Low – prefers and excels in practical subjects	High – successful in Academic and practical subjects	Low – indifferent to most subjects except for sport

by school-based assessments. Initial interviews and ratings using the Multiple Intelligences Checklist for Adults (MICA), modified for middle-years students (McGrath & Noble, 1998), confirmed the diversity among these four students (see Table 15.1).

The students were very similar in terms of their family and cultural backgrounds, and socio-economic status. What delineated their diversity were their contrasting individual attributes. Their self-assessments of how they learned best varied from logical and linguistic to kinesthetic and intrapersonal strengths. Their interests ranged from skateboarding and sport to computers, music and reading. These interests represented student lifeworlds and reflected the interests of their peers or affinity groups (Gee, 2004, 2007; Kalantzis & Cope, 2012b). Student M1 aligned with the “computer-heads,” while Student M2 was one of the “skaters.” Student F1 was aligned with the “squares,” while Student F2 was a “sporto.” These affinity groups encapsulated a variety of beliefs, attitudes and behaviours.

Connection to lifeworlds and learner subjectivities

In their interviews, all students expressed the importance of learning being connected to their lives (Education Queensland, 2001; Comber and Kamler, 2005; Hayes et al., 2006; Kalantzis & Cope, 2012a; 2012b). Student M1 stated:

I found a common link. A subject like popular culture links to me as a person and what I'm interested in, then I just find it quite easy. But with units of work that I don't like, I find it harder because there is no real link or common interest. This topic was different to what I usually do. It was new stuff to learn.

It was about me and about the 1970s and your background. I found out more about me.

Scaffolded learning

All students described how they liked the support teachers provided by scaffolding their learning (Vygotsky, 1962; Ryan & Deci, 2000; Wilhelm, 2007). Student M1 said:

What made it easy was I think my teacher has outlined a lot of things, making it clear and simple so it reduces the difficulty.

Intellectual quality

Three of the students stated that they enjoyed thinking and meeting intellectual challenges (Newmann, 1996; Education Queensland, 2001; Ladwig, 2005; Hayes et al., 2006; Amosa et al., 2007). Student F1 brought out the importance of intellectual quality and student lifeworlds in responding to a question about whether she liked school:

Depends on what you are doing. If you are doing something interesting, like big projects or debates, seeing different points of view and asking questions. If I feel connected to it and know what it's getting at – what the point is ... It is easier to understand why you are doing it and you can actually put it into your life now.

Agency

All students indicated they liked success, choice and working collaboratively; these all link to students having more agency and being more engaged and intrinsically motivated (Ryan & Deci, 2000; Raison, 2003; Hargreaves, 2006; Kalantzis & Cope, 2012a; 2012b). Student M2 stated that he liked working in groups where you could have a “more open opinion; a lot of ideas are equal to one good idea and more information.”

The learning module

Using the state curriculum framework, *Every Chance to Learn* (Australian Capital Territory Government, 2006), teachers designed a *Learning by Design* module that included outcomes to read and write effectively, critically interpret and construct texts, speak with purpose and effect, contribute to group effectiveness, and understand and value diversity. The subject matter focused on the use of technology for entertainment and communication, group identities, popular culture in the media and how these impact on identity (Figure 15.1).

Experiential learning

Connecting the learning to the diverse lifeworlds of students was built into the learning design through activities such as creating timelines about the use of technology in their lives (“Experiencing the Known”) and interviewing their parents about their experiences of technology when they were growing up (“Experiencing the New”). The students were able to draw on their prior knowledge and lifeworld experiences of technology, going beyond the world of the classroom and making their own connections to the learning. Teacher B described this:

In the experiential learning there were collaboration, discussion and listening. They know their own background and through the discussion, they became less inhibited. They were reaffirming what they knew. They had their own ideas

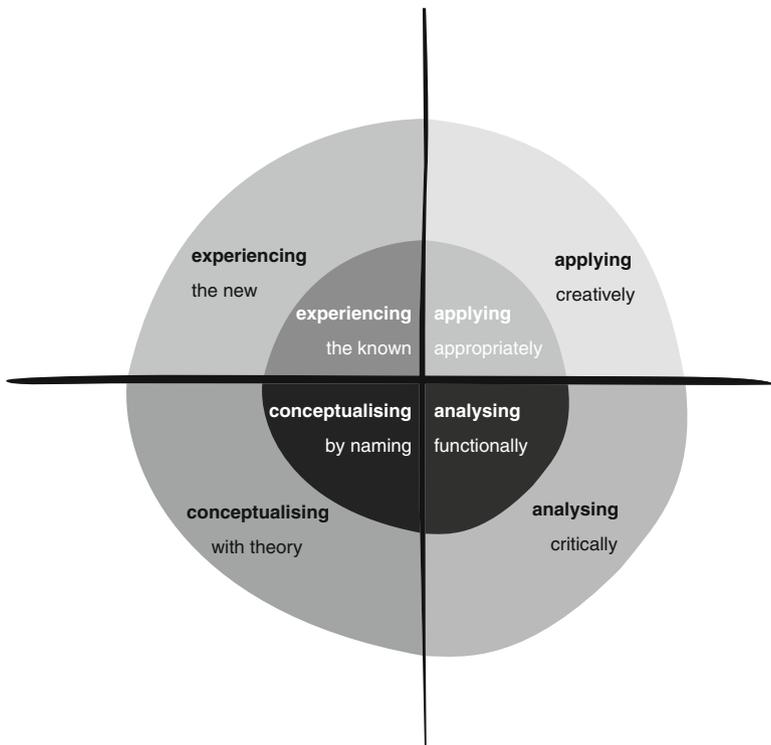


Figure 15.1 The “knowledge processes” of the Learning by Design framework aligned with the Multiliteracies framework

but they were building on ideas and learning how to use others' ideas. It was like stepping stones. The popular culture topic was interesting to them and they were relating it to themselves. That would have hooked them in. There was also the challenge of doing their own timeline themselves and knowing they have to share that makes them accountable. Once they have shared and learned about others, their interest is stepped up and they can all relate to the topic more.

Through "Experiencing the Known," the teacher provided "access without children having to leave behind different subjectivities" (New London Group, 2000, p. 18). Teacher B used terms such as "building on ideas" and "stepping stones" to show how experiential learning provides scaffolding. She also described how experiential learning is collaborative – sharing, discussion and listening, and students have agency in this learning environment. With this shift in the balance of agency from the teacher to the student, learners become makers of their own knowledge and their subjectivities can be incorporated more effectively in the learning, enabling students to "optimize performance outcomes" (Kalantzis & Cope, 2012b, pp. 10–11).

Teacher A also used terms such as "structure it," "build it up," "starting point," "build," "building on their knowledge," and "the next step" to show the scaffolding of learning in experiential learning. This aligns with Vygotskian theorists, who argue that with scaffolded learning, students internalize the strategies and language connected with the learning, which then become part of the child's psychology and personal problem-solving repertoires (Wilhelm, 2007).

In "Experiencing the New," the students interviewed their own parents and they found out new information; their "new" knowledge soon became their "known" knowledge too. Kalantzis and Cope (2005, p. 48) describe this as: "The place to which you travel becomes part of you, part of your repertoire of life experience, and in fact another aspect of your identity." Teacher A also described the agency in discussion as students "setting their own parameters." In both classes, the students felt they belonged to the subject matter and the learning setting of the classroom. This is one level of addressing diversity, for "Engagement produces opportunities for equity and participation. Failure to engage produces failure, disadvantage and inequality" (Kalantzis & Cope, 2005, pp. 46–47).

The experiential knowledge processes offered engagement and scaffolding so that all students were able to participate. This engagement with learners' identities is described by Kalantzis and Cope (2005; 2012b) as "belonging." They argue that "effective learning engages the learner's identity. It builds on the learner's knowledge, experiences, interests and motivation" (Kalantzis & Cope, 2005, p. 51). Gross demographics such as gender and ethnic background can stereotype students, while individual attributes such as experiences, interests and interpersonal styles enable teachers to address

learners' identities. Kalantzis and Cope argue that the realities of difference are represented through such individual attributes, and that when learners feel that they belong, "their differences become a learning resource" (Kalantzis & Cope, 2012b, p. 177).

Conceptual learning

In the conceptual knowledge processes, the students used Venn diagrams to compare and contrast the changes over time between their own and their parents' lives. This was a "Conceptualizing by Naming" activity, enabling the students to develop vocabulary to discuss and synthesize their ideas about the similarities and differences in communication, entertainment, recreation and transport. From this, they were able to draw conclusions and deepen their understanding of how technology impacts on their lifestyles. Teacher A described the scaffolding of learning by "bringing it all together," "going one step further," "thinking more" and "thinking in a different way," as well as sharing ideas and listening to other perspectives, as important to addressing diversity. Learner subjectivities were harnessed because the scaffolding gave the students the support to think, talk and develop their viewpoints and incorporate individual meaning-making, while the cooperative learning structures ensured each student had the opportunity to have input by speaking and expressing their perspectives. Being able to participate in this way opens up the curriculum to diversity. Further, the discussion (auditory and linguistic) was centred on graphic organizers (visual and linguistic) and so catered for different learning styles and enabled the students to make their own meaning. Meaning-making cannot be limited to just the linguistic or written mode. It is essentially a multimodal process of representation (meaning for self) and communication (meaning for others) (Kalantzis & Cope, 2012a, p. 191).

Teacher B commented on the importance of conceptual learning to develop critical thinking, common understandings and a shared language as a basis or scaffold for further learning. The ownership, engagement and participation of the students, whatever their ability levels, was evidence of how the conceptual knowledge process addresses diversity. She stated:

They learned about similarities and differences between their own lives and their parents' lives. They had to be critical, not just look at the information. They had to justify and use criteria to sort things. We also had to do some conceptual learning before we could do the experiential because we had some common understandings and definitions of technology, entertainment and communication. Once we had done the experiential, in the conceptual we were doing something with it. It was giving them ownership of the knowledge and showing its purpose. It helped them to make sense of it and put it into some order. In the "Theorising," they were applying their learning to their own lives

about how technology affects their lives. Because they have already named, they now have a language to discuss and write about it.

Moving back and forth through the knowledge processes of experiencing, conceptualizing and analyzing built learners' understandings and positioned them as active knowledge makers. Further, not only were the teachers demonstrating their repertoires of practice, they also knew which pedagogical move to make and when. "Weaving" (Luke et al., 2003) purposefully through a variety of activities supported the diversity of their students to achieve the learning goals.

The conceptualizing knowledge process derives from the "overt instruction" of Multiliteracies theory (New London Group, 2000). "Overt instruction" does not suggest direct transmission, rote learning and drills. Such teaching will involve assimilation of the learner and the reproduction of what the teacher presents. Mills (2006) found that when overt instruction became teacher-centred transmission, students were unable to use their own meaning-making resources and hence there was less likelihood of learner transformation.

Rather than direct transmission, both teachers emphasized the importance of collaboration and discussion for students to deepen their conceptual understandings. For Teacher A, the scaffolding of learning through thinking and cooperative learning strategies supported the students to conceptualize collaboratively and then form their own understandings of a concept. Strong, Silver and Perini (2001, p. 32) emphasize the increased role of collaborative learning in catering for diversity, but emphasize that students must still come to an understanding of their own, along paths that are "neither certain nor prescribed." The teacher addresses diversity by drawing out students' prior knowledge and then by building on it to deepen students' understandings of the concept, enabling students to draw upon their own meaning-making resources. Using discussion and a variety of texts – for example, visual and linguistic texts – the teacher is able to cater for a variety of learning styles. The most significant evidence that diversity is being addressed is that all students are engaged, able to access and participate in the learning, regardless of ability. This differs from the classroom in which teachers provide students with fixed or uncontested definitions of a concept rather than problematizing the knowledge (Education Queensland, 2001), and where the direction of the knowledge flow is from the teacher to the students along prescribed and pre-determined pathways.

Having a meta-language is also important for metacognition, which is another form of student agency (Bennett & Rolheiser, 2001; Amosa et al., 2007). Language, indeed a meta-language to talk about learning, makes it real for the student and is essential to understanding. Teacher A described student M2's use of grammatical terms in his essay:

When you have that, using the meta-language, then this is a place of learning. We are in a classroom and we are learning; we are talking, using the language of learning.

Similarly, Vygotsky (1986) argued that the mastery of language is essential to transforming thinking and that this is not linked to a particular age but to appropriate instructional support. In *Learning by Design*, this instructional support is provided in the “Conceptualizing by Naming” knowledge process.

Analytical learning

In the analytical knowledge processes, the students explored a range of texts, including magazines, media articles and essays. “Analyzing Functionally” enabled them to focus on the language and visual features of these texts. This supports students so they can create their own texts in “Applying.” It also enables them to understand the choices authors make to position readers in particular ways in “Analyzing Critically.” They can then value a variety of cultural knowledge and perspectives. Teacher A described how the analytical learning supported students at the applying stage:

When we looked at the features of the magazines in conceptualizing – that led to analyzing how magazines influence identity. We were going back and forth between the knowledge processes, so when you get to applied, it's so much easier. And because of all the scaffolding, they are raring to go with the applying.

In asking questions about whose interests are served in a text and how people are positioned by a text, students are empowered to critique the wide range of information that is available through the media and modern technology. This increases their agency not only in being critical readers, in and beyond school, but also in the creation of their own texts, through which they demonstrate learner transformation (Gee, 2000; 2007; Comber & Kamler, 2005).

Engaging with the ideological is another aspect of intellectual quality. Cloonan (2007), using Multiliteracies pedagogy, argues that through critical framing (analyzing), students learn to detach from what they have learned and critique the learning already gained through situated practice (experiential) and overt instruction (conceptual). Here, the analytical is building on the experiential and the conceptual. The role of critical framing is to deepen understanding by assisting students to denaturalize and assess learning “in relation to the historical, social, cultural, political, ideological, and value-centred relations of particular systems of knowledge and social practice” (New London Group, 2000, p. 34). For example, Student M1 was

able to see how baseless prejudice could be, especially given the similarities amongst people from different cultures. He saw his own interest in music and computers as something that people from other cultures might share. Interestingly, the students detaching from what they have learned in order to critique it leads to them identifying the relevance for their own lives and hence their lifeworlds (van Haren, 2005).

Applied learning

In “applied” learning, students have to move beyond responding to creating and becoming knowledge producers. They were able to do so through a range of modes and media, and so a variety of learning styles were catered for, including the visual, auditory, linguistic, spatial and gestural (Gardner, 1993). Encouraging students to present their learning in different modes provides them with choice – another form of agency – as well as linking to their technological lifeworlds and subjectivities. Tasks included writing an exposition about the influences of popular culture; creating an illustrated timeline based on fashion, sport, cars, music, film and video clips, advertisements, art, etc.; designing an individual magazine cover; and presenting research in multimodal ways – for example, PowerPoint, website, role play, media report, visual representation, video, multimedia presentation, etc. Teacher A, commenting on her students M1 and M2, felt that despite the difference in their academic abilities and subjectivities, both were challenged and supported in the learning module.

Visually M2's Magazine cover was the best because of the title, the background, the picture, the colour. He understood the layout and the genre. It's about skateboarding, which he is mad about. He could have done skating in his talk too, but he chose cars. He put so much detail in his PowerPoint. For student M1, what mattered to him was the technology, as he spent a lot of time on his background – the colour and patterns. This was the same in his talk, when he included a short video clip in his PowerPoint. I think that Student M1, maybe it was the research, was more reflective and thought more deeply. He is a deep thinker and when we got to the essay, he found it more challenging and he liked that. Yes, so the idea of having streamed/tracked classes; it doesn't matter [when you use Learning by Design].

Teacher B also discussed how her students were able to achieve the planned objectives:

The students had to write an essay and for Student F1 this was the main thing she learned in this module. The essay suited both girls and the wide range of abilities in the classroom. I could really see that Student F1 was pushed. This was the same for another high-performing boy in the class who

I am always trying to extend. With Student F2, I could see that she was scaffolded enough, so she could do the essay too. They all had the flexibility to move in the directions that suited them and it was structured enough so all knew how to do it.

Student F2 was quite unresponsive in an early interview in which she was asked to talk about her learning. This contrasted with the final interview in which she presented her completed pieces of work. Here, she felt she had been successful and so felt more confident about sharing what she had done. In this interview, there was a greater sense of agency and she felt that she had “learned stuff out of all of it” showing she had engaged with the learning process and had moved from indifference to becoming an active learner. Like Student M2, her feelings of competence had made her more engaged in learning.

Overall, the knowledge processes gradually increase agency for students – so when students apply their understandings and learning, they will be more successful. Student agency was demonstrated in the varied ways the students presented their magazines covers, timelines, collages, research, oral presentations and essays. Effective transformation requires a shift in the balance of agency from the teacher to the students. The evidence indicates that when teachers gave up control and scaffolded the agency of students through the knowledge processes, students took up this opportunity for autonomy and their learning was transformed. This transformation is more than assimilation and just moving to what the teacher wanted the students to learn.

Assessment and learner transformation

By being able to demonstrate their learning in a variety of ways, the students achieved equivalent outcomes, as evidenced in their timelines, essays, research reports, oral presentations and in the design of their posters/collages and magazine covers using a variety of media and modes of presentation. There were many indicators of student learning in terms of their skills, sensibilities and knowledge. The students developed skills in collaboration and group work; problem solving and thinking; investigation through interviewing and research skills; literacy, including reading at the literal and inferential levels of meaning; writing; speaking and listening; and critical literacy and reflection skills. In doing so, they often went beyond their preferred intelligences. Students F2 and M2 did not rate themselves highly on linguistic intelligence, yet completed an essay. Student M1 did not rate himself highly in the interpersonal intelligence, yet contributed to group interactions and gave an oral presentation to the whole class. This also demonstrated changes in their sensibilities. Student F2 become more confident and started to see herself as a learner in her English classroom; Student M1 also gained better understanding of himself as a learner in

the subject English – he commented that after the research project, he felt much more confident and saw himself as being just as competent in English as mathematics. Student M2 showed his most significant change in how he engaged more confidently in English, while Student F1 gained greater understandings about herself as a learner, particularly how she liked meeting and overcoming challenges.

The transformation of the students was also evident in the outcomes they achieved on the “Learning by Design Criteria for Measuring Learning” (Kalantzis et al., 2005, pp. 95–97). This framework evaluates performance on each of the *Learning by Design* knowledge processes at three levels: assisted competence; autonomous competence; and collaborative competence. All four students were assessed at the beginning and end of the implementation of the learning module. Both teachers felt that Student F2 and Student M2 were mainly at the assisted-competence level at the beginning of the project. By the end of the learning module, they had moved to either autonomous competence or at least to higher levels of assisted competence. Student F1 and Student M1 were assessed mainly at the autonomous-competence level and moved to either collaborative competence or higher levels of autonomous competence. This assessment, plus the evaluation of student work samples, indicates the transformation of all of the learners through *Learning by Design*.

The extent of learner transformation in this study could not have been captured through rigid one-dimensional universal standardized testing which governments have used to respond to issues of diversity. Despite claims that it addresses diversity, such testing is one-dimensional and does not capture the learning that students are able to demonstrate through assessment linked to the teaching and learning in the classroom. Many studies emphasize the importance of addressing diversity through authentic assessment and the measurement of achievement against starting points rather than against state averages (Newmann, 1996; Strong et al., 2001; Comber & Kamler, 2004; Hayes et al., 2006). The negative effects of examinations on many students demonstrate how such testing works against diversity. Ryan and La Guardia’s (1999) research highlights the importance of students’ lifeworlds in designing learning. They found that high-stakes testing constrains teachers’ curriculum choices and teachers’ ability to address diversity by limiting their opportunities to respond to students’ interests. Interventions based on the results of standardized testing can further marginalize the students who are offered drills and a skills focus rather than a curriculum of high intellectual quality.

Deci, Koestner and Ryan (2001) also found that with external rewards, such as grades on an examination or report card, students perform more poorly, think of themselves as less competent, and feel more anxious than when they use feedback from teachers to monitor their learning. This was evident in the increased confidence of Students F2 and M2, who met the

objectives designed by their teachers but generally performed poorly in system testing.

Summary of findings

Through *Learning by Design*, the teachers made pedagogical choices that engaged students in their learning and created a sense of belonging by drawing on and valuing their prior knowledge and linking classroom learning to the students' lifeworlds and learner subjectivities. There were varied starting points and multiple forms of engagement for the learners to address learner differences and bridge the gap in their lifeworld experiences (Kalantzis & Cope, 2012b).

Learning by Design scaffolded student learning to achieve equivalent outcomes. The teachers provided support by weaving between the *Learning by Design* knowledge processes, and the students continually drew on prior learning and their lifeworlds to support new learning. This personalized the learning for each student, even though the learning had been designed for the whole class (Suominen, 2009). Each of the knowledge processes built on each other, and the teachers structured and sequenced them purposefully to deepen student understanding and to increase student agency. Representing different ways of "knowing," the knowledge processes of experiencing, conceptualizing, analyzing and applying catered for different learning styles. In doing so, each knowledge process was important to address diversity (Cope & Kalantzis, 2000; Kalantzis et al., 2005; Kalantzis & Cope, 2012b)).

Rather than top-down didactic models of transmission, teachers selected collaborative activities to enact the knowledge processes so students were thinking, discussing, problem-solving, synthesizing, theorizing, drawing conclusions and developing deep understanding of the subject matter. This ensured intellectual quality and the diverse perspectives enriched the discussion, supported by a developing meta-language through the conceptual knowledge process and the opportunity to critique through the analyzing knowledge process; hence the diversity of the students became a productive classroom resource.

Learning by Design transferred agency from the teachers to the students so they became makers of their own knowledge, not just receivers of it. Successful attainment of the learning objectives increased the sense of agency by the students. Critiquing also empowered the students with more agency. With their increasing agency, there was more engagement and intrinsic motivation, and the students were positioned as active learners able to choose different pathways and end points in achieving the planned objectives (Rogoff et al., 1996; Ryan & Deci, 2000; Comber & Kamler, 2005; Hargreaves, 2006; Kalantzis, 2006; Kalantzis & Cope, 2012a; 2012b).

Further, diversity was also addressed through the students working collaboratively, which gave them increased agency and greater responsibility for their own learning and for that of other learners. In doing so, they became

more tolerant of each other's experiences, backgrounds and learning styles. This also helps to prepare learners for workplace cultures in which collaboration and self-motivation are required.

Moving from the students' lifeworlds by taking them into new learning and expanding their knowledge, understandings and perspectives are essential to learner transformation. Through *Learning by Design*, the teachers tracked and ensured the transformation of the learners against the planned objectives of the learning module through different pathways and multi-modal ways of demonstrating their learning (Kalantzis et al., 2005; Hayes et al., 2006; Kalantzis & Cope, 2012a; 2012b). All of the students, despite their different starting points, achieved the outcomes of the learning module, which were closely aligned with system curriculum goals, including academic and social goals and involving learner transformation in skills, knowledge and sensibilities.

By using the pedagogical framework of *Learning by Design*, the teachers demonstrated that successful learners require teachers who make purposeful pedagogical choices. The teachers, whether very experienced or a beginning teacher, used *Learning by Design* in a way that provided them with a structure for making these pedagogical decisions, but did so with flexibility in order to address the diversity of their students (van Haren, 2005; Neville, 2008).

Conclusion

Learning by Design is an effective pedagogical framework, working with, valuing and harnessing diversity. *Learning by Design* emphasizes the important role of teachers' pedagogical choices to harness student diversity, scaffold learning, incorporate technology and diverse ways of meaning-making, and address student underperformance. The *Learning by Design* approach also offers teachers the possibility of transforming their practice to meet the social justice goals of a truly inclusive education, as it provides teachers with innovative ways of addressing learners' subjectivities, creating belonging and student agency, addressing underperformance, and ensuring learner transformation rather than assimilation.

Learning by Design can also take learners into new places and prepare them to participate in and contribute to a more just and diverse society and world. This is reflected in student M1's comments about what he had learned about diversity in the learning module about popular culture:

Popular culture ... I'm not entirely sure. It's just so vast. The way that even within cultures it is different. Like all over the world there are different groups. You've got people who like sport, people who like their music; you have people who work on computer stuff. You've got many different areas. Sort of, like, when you look at it like that, it's difficult to see how people are sort of prejudiced against different cultures ... when you might not know that they could be

interested in the same popular culture thing, in the same category as you are. It's just the way the world is.

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16

Pedagogical Prompts: Designing Experiences to Promote Deep Learning

Nicola Yelland

This chapter focuses on the ways in which the Learning by Design theoretical framework acts as a pedagogical prompt for teachers so that they are able to create learning experiences that complement the range of pedagogies described as knowledge processes and support 21st century skills and deep learning. The chapter discusses a learning module about the topic of “Living Things” that is an essential component of the National Curriculum for Science in Australia. The learning module was designed to support learning about living things in the early years (Kindergarten (4–5 years of age) to Year 3 (8–9 years of age)) and includes activities that could be achieved at a variety of levels as well as across the knowledge processes of experiencing, conceptualizing, analyzing and applying.

Introduction

The *Learning by Design* theoretical framework (Kalantzis & Cope, 2004, 2010, 2012) focuses on pedagogy as a variety of knowledge processes. In the original *Learning by Design* project, the participating teachers reported two significant shifts in their practice in their adoption of the framework. First, they noted that the pedagogies as knowledge process framework supported the use of a *professional language* with which they could engage with their peers in meaningful conversations about teaching and learning. It also enabled them to encourage their students’ thinking about their learning in a more nuanced and overt way. Secondly, the framework acted as a *pedagogical prompt* for the learning design process. This meant that teachers were able to create contexts for learning that enabled *experiencing, conceptualizing, analyzing* and *applying* knowledge in diverse settings for all students in their classes. It was apparent that when we started the project that the teachers were very good at introducing a new topic by connecting it with the children’s prior knowledge or their own experiences (*experiencing the known*). They were then able to connect this with the new learning required (*experiencing the new*) in a range of ways. They also designed learning activities that required *conceptualizing by naming* when they created contexts for the children to identify and

name the new concepts and link them to their existing knowledge structures and rules. What they did not do very often, or at least in a systematic way, was go beyond these pedagogical processes to incorporate the other elements in the learning design process. Therefore, designing learning activities that required *conceptualizing* by theory, *analysing* (functionally and critically) and *applying* (appropriately and creatively) were often not included in a series of learning tasks. In this way, having the framework acted as a pedagogical prompt to ensure these factors were included. The teachers also indicated that being prompted to design more and varied learning activities not only enriched their own learning and that of their students, but also facilitated deeper learning and meaning-making around the investigations that the students embarked upon. Incorporating new technologies and communicating findings to authentic audiences, who also provided feedback about the quality of their work, was an essential part of this process (Yelland et al., 2008).

Thus, the process of designing learning modules in the context of the *Learning by Design* theoretical framework required that teachers respond to the pedagogical prompts to ensure that the experiences include each dimension where relevant. In this way, the teachers are able to create authentic learning experiences as well as reflect on their own teaching practices and the learning of their students to maximize the potential for learning.

In this chapter, I discuss the design and implementation of learning experiences in an early childhood curriculum (Kindergarten to Year 3) module on the topic of “Living things” and provide examples of the ways in which the *Learning by Design* framework created contexts in which pedagogical prompts were successfully deployed so that the teachers were able to enhance the learning experiences to promote deep learning. The examples are taken from the kindergarten to Year 3 national curriculum in *Science* which is adapted at the State level (Victoria) and organized around specific learning outcomes in the key curriculum areas. The curriculum modules support investigative approaches to learning (Yelland, 2007; Yelland et al., 2008) and builds on the concept of new learning (Kalantzis & Cope, 2012). A module on “Living things” was designed to provide structure to the topic, yet it was flexible enough to let the children follow their own interests. (An overview is shown in Appendix 16.1). In designing the learning module the teachers wanted the children to work both individually and collaboratively on the project activities and to share their findings with their peers, as well as present them to the broader school community. An essential component of the learning process was the use of new technologies and the opportunity to develop skills in creative thinking, collaboration, and to communicate their findings to authentic audiences.

Background

Living in the 21st century is significantly different from living in previous times due to a myriad of factors that centre on the impact of new

technologies on our lives. The role of new technologies is ubiquitous in our everyday lives, yet their use in schools has often been limited due to a large number of reasons, including lack of funding for machines, as well as teachers feeling confident about using them in school-based work (Cuban, 2001).

There have been calls for a refocusing of curricula away from *content* to the acquisition of *21st century skills* (Partnerships for the 21st century, 2008), which have been extended from the original four; *creativity, critical thinking, collaborating and communicating* (Trilling & Fadel, 2009), to include *citizenship* and *character education* (Fullan, 2012). Further, it is also recognized that fluency with new technologies will be an essential component of future employment across the range of opportunities (Cuban, 2001).

Fullan (2012, 2013; Fullan & Langworthy, 2014) regards technology as one of three *big ideas* in education together with pedagogy and change knowledge. For Fullan, the concept of *change knowledge* is an essential component of being successful in the 21st century. Being able to recognize the components of learning are an integral part of being knowledgeable about the mechanisms of change since we need to know “what we should do with all this information to change things, presumably for the better” (Fullan, 2013, p. 1).

Fullan and Langworthy's (2014) *new pedagogies for deep learning* incorporate the idea of giving students a voice in their learning via project-based inquiries, including direct instruction where appropriate, and involving teachers and students in planning learning experiences that are both face-to-face and electronic. It exemplifies blended learning contexts. Deep learning is aligned with the full range of 21st century skills and takes place in the context of curriculum frameworks that support their acquisition, use and application in authentic contexts.

This view resonates with the design principles inherent in *Learning by Design* and the learning modules created using this framework include opportunities for authentic learning (Yelland, Cope & Kalantzis, 2008). Further, because the learning modules are shared online in a bookstore – teachers in the community are able to share their modules and learn from each other about the ways in which they are incorporating new learning (Kalantzis & Cope, 2012). They are part of a community of practice with shared professional identities and learning goals. This community focused on learning processes as well as knowledge building. The authentic activities that engage learners in these school contexts provide them with opportunities to become fluent in 21st century skills. The teachers involved in *Learning by Design* projects have always contended that their participation has enhanced and extended their pedagogical repertoires which expanded as a result of applying the framework and have noted that it has encouraged deep learning of concepts and ideas.

Living things

In Australia, the National Curriculum in Science has two components relating to Science *understanding* and Science as *human endeavour*. Science

as understanding includes the biological, chemical, physical and earth, and space sciences. Science as a human endeavour explores the nature and development of science and the use and impact of science on society. Within the *biological* sciences the idea of *Living things* as a part of the world that we live in is a fundamental concept and extends to the notions that living things are different and diverse, can be plants and animals and only exist in certain circumstances - they need air, food and water to thrive. The overview provided in the National Curriculum and its adoption by the States (e.g. AUSVELS in Victoria) with outcome descriptors, includes a broad overview of suggested concepts, but does not include examples of possible activities that might be appropriate at the various levels of schooling. As such teachers are required to design learning activities that support the overall aims and objectives of concepts for each of the topic areas, to suit their local needs and to demonstrate specific learning outcomes.

When working with teachers on an investigation or topic, it is often useful to begin by drawing up a curriculum web that includes the possible directions that the topic may take. The curriculum web (Figure 16.1) for *Living things* was designed for a K to Year 3 context in which the design was deliberately broad enough to allow not only for a wide range of interests, but also so that outcomes could be achieved at various levels of sophistication. So, for example, kindergarten children (4–5 years of age) could explore the life cycle of a plant by planting seeds and watching them grow over a period of time, while children in Year 2 (age 7–8 years of age) could explore human life cycles in their production of an electronic book illustrating the various phases of a particular life cycle. In planning for the early years, it is essential to consider a range of learning activities that link Science with Literacy and Numeracy, and it is in Science that the children actually have opportunities to analyze and apply the concepts in authentic scenarios and share their findings with a broader community of learners.

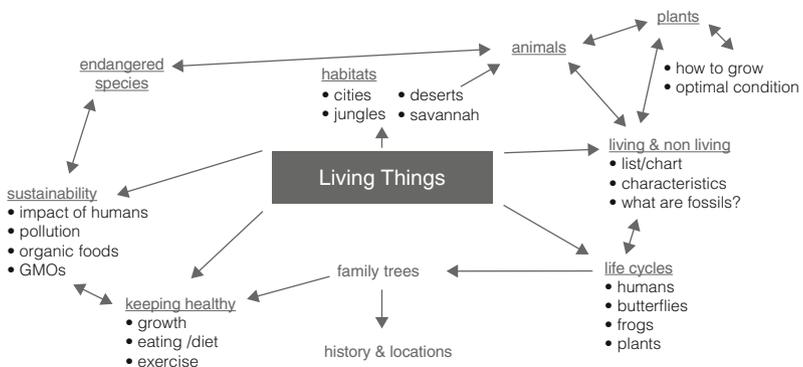


Figure 16.1 Living things curriculum web

Learning about living things

In this chapter I discuss examples of learning activities to illustrate selected elements of the *Learning by Design* pedagogical framework. The examples are from a range of contexts from kindergarten (age 4–5 years) to Year 3 (age 8–9 years) classroom. The schools are located in the State of Victoria, in Australia, and include both urban and rural settings. The kindergartens are community-based and are not part of the compulsory schooling system. School begins in the Preparatory year, once the children are 5 years of age, and continues for 13 years to Year 12. The overview (Appendix 16.1) illustrates some of the range of activities that are possible in this broad topic. As previously stated, the activities were designed for the early childhood years across the age range of 4–8 years of age, and could be successfully completed at different levels of sophistication. Thus, an eBook with 4 year olds was mainly compiled by the teachers, who guided the children about the technical side of the production. In Year 2 the children worked autonomously in their small groups to create the eBook, then presented it to their class and finally, the whole school, at an assembly. Similarly, discussions of what constitutes the difference between living and non-living items became more complex as the children increased in age and the forms of recording their conclusions about the aspects of these differences became more elaborate and were decided upon by negotiation with the group.

What are living things?

Introducing the topic involved a clarification of the concept of what constituted living things and what by virtue of exclusion, were not. With the Preparatory classes this was initiated with a discussion of the characteristics of living and non-living based on our existing knowledge and life experiences (experiencing the known). This was then recorded on a whiteboard so that the whole group could view and comment on it. The discussions then led to consideration of the characteristics of living things, so that we were able to summarize what we knew about the concept (conceptualizing by naming), again in the whole group context. A natural place to begin connecting the known to the new was to consider the children's own life examples and how they had grown since they were born. The children went home to discuss the topic with their parents and came back with photographs of themselves as babies or toddlers. The Kindergarten group then made their photographs into individual jigsaws (Figure 16.2) while the Preparatory class considered how much they had grown since that time in terms of their height/length, their weight and their language, and recorded this in data charts (Figure 16.2).

Again, as an example of moving from experiencing the known to the new, at this point in time one of the children had visited Lake Tyres, located in

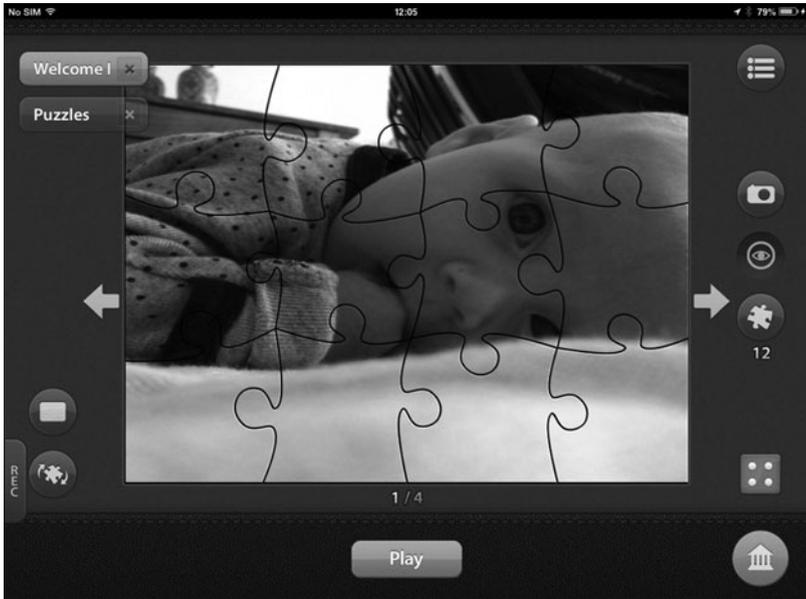


Figure 16.2 Real life jigsaws

the east of the State, and had come across some fossils while exploring with his parents. This led to a discussion about fossils and whether they were living or not based on the fact that they were the remains of living things. The children made clay moulds of the fossils and investigated the prehistoric living things that they represented. Having established what was living and what was not, it was then possible to explore the concept more deeply and investigate the range of living things that they could identify.

In the kindergarten, the teacher bought some hermit crabs and placed them in an aquarium. While the children were fascinated by them, they noted that there was not a lot of action on the part of the crabs and they wondered why. Using iPads to investigate (Yelland & Gilbert, 2013, 2014), they discovered that hermit crabs were nocturnal animals and only moved around at night – they slept during the day, while the children attended kindergarten. They were able to view YouTube videos of the hermit crabs in lieu of staying at the kindergarten all night, and also became curious about other animals that were also nocturnal. The children were also fascinated about the fact that these particular crabs outgrew their shells and had to find new empty ones. Charlotte brought some in readiness for the crabs move as they were not sure when it would occur, and placed them all in the aquarium in anticipation of the event (applying appropriately).

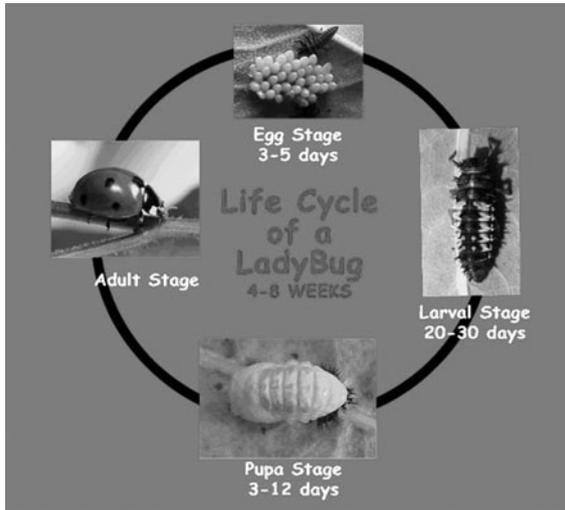
In following up on an interest in minibeasts, a Year 1 / 2 mixed aged class created clay animations (applying creatively) (Figure 16.3). The productions not only enabled the children to discuss and discover new information about ladybugs, but also provided a new skill-building context in which they were able to represent their knowledge in a new modality.



Figure 16.3 Ladybird animation

In Year 2, the life cycles of living things were approached in various ways. One class documented the life cycles of different living things like a ladybug, frogs and the monarch butterfly (Figure 16.4). Other groups made eBooks depicting the human life cycle (Figure 16.5) and animals (Figure 16.6 – Emus). The eBooks were created in small groups of up to four children. The activities were characterized by investigations instigated by the children, discussions about design and a lot of negotiation and resolution about the final product to be presented to the whole class.

In another class, the focus centred on disruptions to cycles and included a consideration of life in another part of the world where the citizens lived on the equivalent of a dollar a day and were basically self-sufficient by growing their own crops and selling their surplus. The catalyst for this discussion was a YouTube video that the teacher found that was part of a series about living on a dollar a day; the episode was entitled “Disaster Strikes” (<https://www.youtube.com/watch?v=bk9GL1AnMLM>).



A ladybug lays eggs.
They then become
larvae & then pupae.
Finally the ladybug flies
out.

Figure 16.4 Life cycle of a ladybird

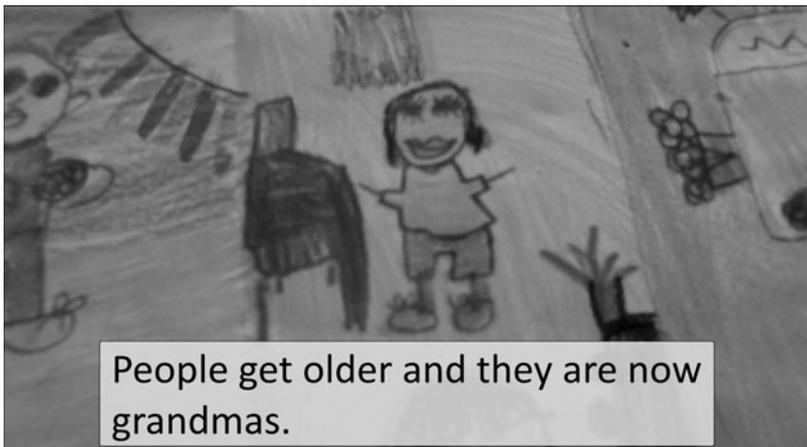


Figure 16.5 Human life cycles ebook



Figure 16.6 Life cycle of an emu

After viewing the video the teacher led the discussion highlighting the differences between living in Guatemala and Melbourne. The children then considered the benefits and drawbacks of each (conceptualizing by naming and theory). A discussion ensued about natural disasters – starting with a consideration of one that we have experienced in Australia (experiencing the known) and moving beyond that to global contexts such as the earthquake in Haiti and the Tsunamis in Japan and Thailand. The follow-up required that the children explore one of these disasters, which were conceptualized as being examples of disruptions to cycles of life – and to present what they discovered to the group (conceptualizing by naming/analyzing critically). One group focused on Haiti and the ramifications of the earthquake (Figure 16.7) and began by locating the country and noting that while it was an island like Australia, this island contained two countries: Haiti and the Dominican Republic. They also noted its distance from Australia and figured out how they would get there if they had to take an airplane.

Meanwhile, in the kindergarten they were planting seeds and recording what they did in an eBook, and in Year 3 considering the optimal conditions under which plants grow (applying appropriately/analyzing functionally) as they created vegetable gardens around the classroom buildings. Because the class had tablet technologies available, the process of planting the seeds could be recorded visually, saved electronically, and read and reflected on at a later date. Additionally, the plants' growth could be recorded on a weekly basis and charted. This enabled the children to represent the growth mathematically and use numbers in a practical and

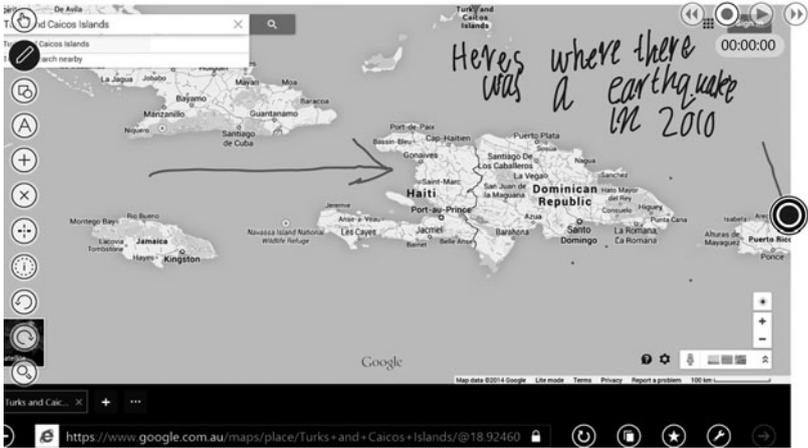


Figure 16.7 Where is Haiti

appropriate way (applying appropriately) in a context that was both fun and interesting to them.

In fact, while the topic was living things, the learning contexts created provided excellent opportunities for the children to use their mathematical skills in real-world contexts (see also Yelland et al., 2014). In a preparatory class (5–6 years of age) as part of the investigation they were about to go on a farm visit. We worked with a small group to discover what animals they expected to see on the farm, as well as to document their favourite animal. The children collected the data and we helped them to assemble it on a graph to represent their findings (applying appropriately). The observations of what the graph revealed (Figure 16.8) were rich in mathematical language and provided a good example of how to use numbers in a relevant way. Some of the things that the children noted were:

- “Who would have thought that pigs would be the favorite farm animal!” I thought it would be cows or horses.
- “I see only one person chose the farm dog. That means six more people chose pigs as their favorite than dogs.”
- “Can you see that the same number of people like dogs and sheep?”
- “Those who like dogs, horses, cows, and sheep (6) are the same that like pigs (6).”

While studying living things, the teachers also integrated the topic by including scenarios for incorporating animals into the basic operation of mathematics. Thus, they did division examples in the context of fish in an aquarium (Figure 16.9). They also visited an aquarium in the city as

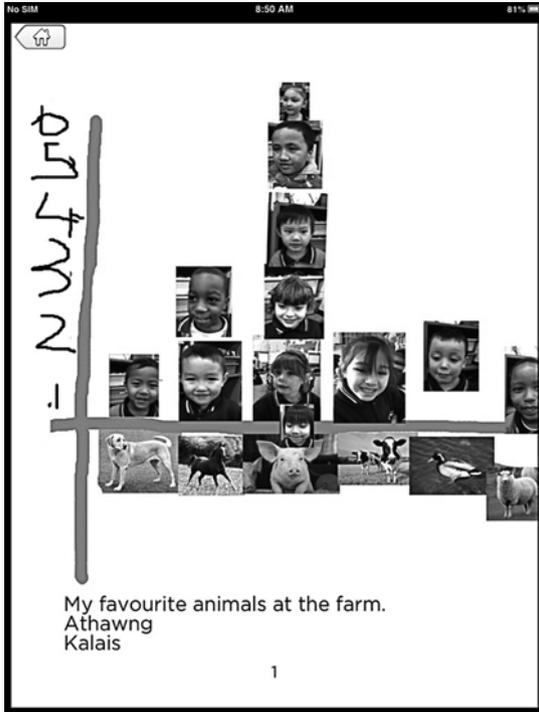


Figure 16.8 What is your favourite farm animal?

Let's Divide

Laura, Dean and Harrison wanted to buy all the goldfish in the Aquarium. Share the goldfish equally between them and record your findings.

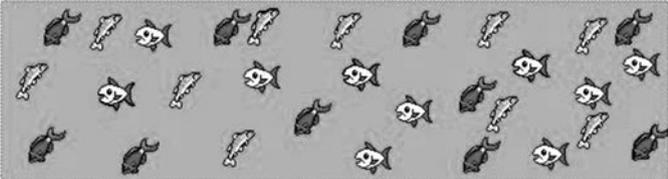
Laura	Dean	Harrison
		
Aquarium		
		

Figure 16.9 Dividing with fish

part of investigating the topic of animals that live in the sea and rivers. Incorporating local visits to farms, museums and other places of interest provide an excellent context for knowledge-building and linking with the local community. The range of resources available is usually rich and varied and complements online resources in new and dynamic ways.

Summary

The *Learning by Design* framework incorporates the concept of pedagogies as knowledge processes, namely: experiencing, conceptualizing, analyzing and applying. The work by our team of researchers has indicated that the language inherent to this process is essential for effective professional conversations about the nature of teaching and learning. Additionally, in using the framework teachers are prompted into action to decide what activities might support learning most effectively related to each of the knowledge processes. This use of the framework as a pedagogical prompt has been cited by the teachers as being one of the major benefits of taking this approach to the practice of designing learning activities. It makes the teacher think of activities to exemplify each one where relevant, while recognizing that any planned activity might also include two or more of the knowledge processes.

In thinking about units of work that teachers prepare around topics in the early years, the traditional approach might include aligning activities in a sequence. Our research has revealed that it would probably include tasks that are focused around experiencing and perhaps conceptualizing by naming. In using the *Learning by Design* conceptual framework teachers are prompted to think about additional types of pedagogies that incorporate conceptualizing by theorizing, analyzing functionally and critically, and applying appropriately and creatively. This extends their pedagogical repertoire and enables deep learning. The topics are designed as a coherent set of activities that range over the pedagogies as knowledge processes and a basic philosophy encouraging investigative approaches that centre on authentic activity. Further, the use of new technologies encourages multimodal learning and communicating findings to a broader audience.

We have found that the early childhood teachers that we have worked with are highly motivated to adopt this format for designing learning experiences and are able to map outcomes to state-based curricula in a natural and practical way which in turn facilitates their reporting process. The work also resonates with other theoretical work that is promoted in the various State Education Departments (e.g. Fullan, 2012, 2013), aligns with preparing children for new learning (Kalantzis & Cope, 2012), and encourages the use of 21st century skill building (Trilling & Fadel, 2009).

Appendix

EXPERIENCING

KNOWN

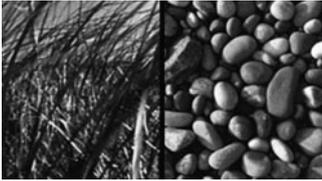
Drawing on learner prior knowledge and experience, personal interests, life worlds, the everyday and the familiar, making connections to self and to other texts and establishing baseline knowledge.

NEW

Introducing and familiarising learners with a new experience by exposing them to texts (real or virtual), guest speakers, presentations, excursions, etc and ensuring they can respond in open-ended ways.

Living Things need water, air, food & shelter to survive.

1. Collecting photos of living and non-living things and classifying in a matrix.

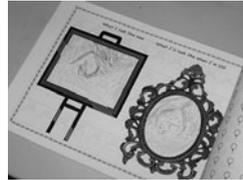


2. Video: Is it alive or not? <http://illinois.pbslearningmedia.org/resource/tdc02.sci.life.colt.alive/is-it-alive/>

3. When I was a baby... (photographs/drawings)



1. When I am 100 years old – I will look like this...



2. Are fossils living things? (Lake Tyres).



3. Visiting zoo/ natural history museum.



CONCEPTUALISING

NAMING

Using the experiential learning to define and draw out new concepts/ideas/ themes/ understandings/ vocabulary, and identifying numeracy and literacy strategies.

THEORISING

Generalising and synthesising concepts by linking and drawing them together, exploring them in more depth, deepening understanding and practising skills. It may include 'what if' scenarios.

EXPLICIT TEACHING THROUGH MODELLING, SHARING AND GUIDING

1. How do we know its living?
 - a. It has a face ୩୩୩୩
 - b. It grows ୩୩୩୩୩
 - c. It moves ୩୩୩୩
 - d. It talks ୩୩୩
 - e. It has a heart ୩୩୩
 - f. Has hands ୩

What conditions do you need for plants to grow well?



 ANALYSING

FUNCTIONALLY

Examining the structure of multimodal texts and linguistic, visual, gestural, audio and spatial grammar in context. Examining function: What is it for? What does it do? What are the effects?

What happens when there is not enough water or too much water?

The Change series: Episode 4 – Disaster strikes. <https://www.youtube.com/watch?v=bk9GL1AnMLM>

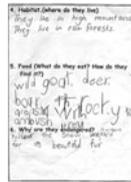


CRITICALLY

Interrogating purpose & audience, & how multimodal 'grammatical' choices position audiences.

Examining relevance, different perspectives & individual, social, cultural & environmental effects. Who gains/loses?

What happens when people kill animals for their skin, their horns or to eat?



 APPLYING

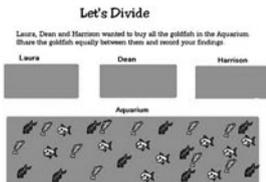
APPROPRIATELY

Applying independently what has been taught and providing assessment opportunities. It involves transformation, reinventing or revoicing the world in a new way. It can be creative.

1. eBooks – My name is... I like to... I am good at....



2. The Aquarium – using division


CREATIVELY

Doing things in interesting ways by independently taking knowledge and capabilities from one setting and adapting them to a different setting. Can also include extension of the learning.

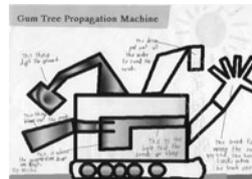
1. Life cycles of humans (eBook)



2. Mini-beasts animation



3. Plant propagation machine



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