

Mobile Literacies

Navigating Multimodality, Informal Learning Contexts and Personal ICT Ecologies

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Abstract. The affordances and ubiquitous uptake of technically convergent devices has led to widespread change in communicative practice. Mobile devices and their wider ICT ecology have afforded people with the means through which to consume and produce multimedia content. In such an environment, literacy can no longer be limited to the reading and writing of word and character-based texts. The emergent field of New Literacies research has contributed early understandings of these new practices. This paper contributes to understanding how these new literacies occur within a mobile and informal learning space. This study details *mStories* a creative, participatory, digital mobile storytelling project comprised of nine adult participants who created “stories” with their mobile phone device. These stories were shared on the *mStories* project website, which became a repository for: fiction, non-fiction, poetry and diary-style content. Stories used a range of written text, visual images, sound, music and video. Using content analysis, interview and survey methods this paper describes mobile literacy as characteristically situated and experiential in nature. The mobile device was catalytic to furthering digital writing on other devices within the individual’s wider ICT ecology. This research contributes understandings of multimodal mobile literacies as part of a foundation for framing and understanding mobile learning in informal settings.

Keywords: Mobile learning, informal learning, new literacies, ICT ecology.

1 Introduction

Social media, web 2.0 applications and mobile devices have come to characterise a digital landscape that affords people with new ways to interact, communicate and learn. The communication culture and the artefacts that comprise it are increasingly described as participatory, visual, and multimodal in nature [1,2,3,4]. Mobile devices are just one tool that enables people to navigate these new semiotic surrounds. The technical convergence that typifies later generations of mobile devices has privileged digital media (e.g. video) and multimodal content (e.g. image, video, sound) over traditional written text. People now have the tools with which to produce and share

their own multimedia culture and meanings [5]. User-generated content platforms form an environment that supports widespread participatory culture: non-experts are able to create and share new content online [3]. Mobile devices are one gateway to participating in such a culture.

1.1 ‘New’ Literacies

Shifts within the socio-technical landscape, challenge traditional concepts of literacy and what it means to be literate. In this context traditional definitions of literacy that privilege the written word to the exclusion of all else, fail to account for the many ways in which people go about interacting, communicating, and making meaning with the tools they have. Recent literacy research has begun to redefine and explore these phenomena. Discussions have shifted from the singular ‘literacy’ to the plural ‘multiliteracies’ [6]. Terms such as ‘visual literacy’, ‘multimodal literacy’, ‘digital visual literacy’ and ‘design literacy’, attempt to account for both the mode and skill associated with such behaviors [4], [7,8,9,10]. New literacies present educators and technologists with more than just a change in terminology. The acquisition and learning of these skills differs to that of traditional literacy. Where reading and writing were acquired within the educational institution and/or home, new literacies may be informally learnt, self-taught and formed outside the classroom. As such, the concept of new literacies is part of a wider paradigmatic shift in learning. Educators may find themselves to be less literate in these new skills than their students [18]. The rapid innovation of technologies brings rapid change to the modes and medias that comprise these new literacies. In these conditions, achieving a complete understanding of these new communication skills may be impossible for any one individual – teacher or student, adult or child [19]. These changes disrupt traditional models of learning.

The importance of such research is not only in its theoretical contribution to understanding existing practice but also in its recognition of the importance of such skills. Like reading and writing, understanding of digital technologies and multimodal literacy practices is essential for participating in a society that utilizes both [11]. The relationship between digital technologies and new literacies has been recognised as a significant area for research [12]. To date, however empirical studies of new literacies have predominantly focused on either formal learning environments, child or youth practice or digital desktop technologies [7], [9], [11], [13]. New research into the literacies afforded by mobile device challenge some of the assumptions made in prior studies and indicates that there is a real need for further research [14,15].

1.2 Digital Storytelling

Digital storytelling is especially relevant to discussions on new literacies. Pioneering work has demonstrated the extent to which digital storytelling can empower and give voice to its participants [16,17]. This work, however, is largely under-theorized and not framed in terms of literacy. Notable exceptions to this include recent studies of mobile digital storytelling that are framed by theoretical perspectives, such as social semiotics, that are derived from new literacies research [18,19]. However, these stud-

ies derive their empirical data from work undertaken in a formal educational setting [18] or with adolescents [19]. The informal adult learner, though a major adopter and user of mobile technology, is not accounted for. Though still an emerging field, mobile digital storytelling presents practical strategies that are well suited to exploring and researching new literacies.

1.3 Mobile Digital Literacies

The question for mobile learning is how these literacies are enacted within the mobile space. Mobile technologies support learning in informal places, and can situate a learning conversation within the individual user's work and personal time and space [20,21,22]. To understand what form this learning conversation might take, we need to understand new literacies from a mobile perspective. This means not only practically grounding the research, for example in studies involving mobile devices, but orientating such studies theoretically within existing contributions of mobile learning. From such a vantage point studies may better account for human and computer mobility, informal practice and how literacy practice form part of the wider ecological mobile complex [23].

1.4 Contributions

This paper contributes an understanding of new literacies that emphasises the informal adult learner within the mobile complex. Despite the widespread adoption of smartphone technology, research on mobile literacies has confined itself to young persons or those enrolled in formal education. This paper presents *mStories*, a participatory mobile digital storytelling project comprised nine adults from across Australia and the UK. Through qualitative methods, this paper describes the mobile meaning making practices of adults in informal settings. This paper draws attention to the inherently multimodal (e.g. image and text, sound and video) nature of mobile device use, and how this usage relates ecologically to other devices owned by the individual. This paper describes how participants engaged in creating multimodal content within the ever-changing context of the mobile space and the learning behaviours that participants presented. From these contributions future research may be better placed to explore how such skills are acquired or best applied to facilitate learning.

2 The *mStories* Project

mStories was established as a participatory creative project. Creative perspectives have been shown to be a valuable approach to researching multimodal semiotics and practice [24]. The project was originally structured around the concept of a writers' group: a community group where people could share, engage and learn about creative writing within a community group setting. The project recruited participants through writers' groups and community networks. The group was originally established to work face to face, but the digital aspects of the project changed the dynamic in which

people wanted to participate [25]. Secondly, though established on a writers' group model it was largely non-writers who expressed interest in joining. The final *mStories* participant group was composed of nine people. Participants were from Australia (n=5) and the UK (n=4), the age range spanned from 21-25 to 46-55 and there were both male (n=4) and female (n=5).

Whilst pre-existing user generated platforms (e.g. Facebook, YouTube, Flickr) offer places for people to create multimodal content, such forums already have firmly established genres. In contrast, *mStories*, as an independent project, provided a creative space from which people could engage informally in *new* meaning making and practice.

2.1 Methodology

The project-based approach was able to accommodate a diversity of mobile device types and individual participant needs. We address the research question through qualitative data on both 'what is made' and 'how it is made'.

Research Question

How can we best describe adults' informally acquired mobile literacy practices?

Data Collection and Analysis

The research question was addressed through three iterative phases of data collection and analysis. The stages are depicted in Table 1.

Table 1. Iterative staged data collection and analysis

<i>Stage</i>	<i>Method</i>	<i>n</i>	<i>Aims and data collected</i>
1	Preliminary survey	9	Who participated and why? <ul style="list-style-type: none"> • Participants' demographics • Type of smartphone and existing usage • Occupation and hobbies • Motivations for participating
2	Content analysis of <i>mStories</i>	9	What was created? <ul style="list-style-type: none"> • Modes and media used • Genres and content created
3	Post-story interview and survey	9	How did people create the <i>mStory</i> analysed in Stage 2?

3 Findings

The findings from the *mStories* project are presented sequentially by stage. Qualitative data is summarized and supported by example quotations. In instances where it is both clearer and more informative to present findings numerically (e.g. common themes) we use numeric data, though as a qualitative study this data has no statistical significance.

3.1 Stage 1: Preliminary Survey

The preliminary survey was designed to find out what mobile phone devices people owned and how people used such devices. There are several different ways of distinguishing between different Smartphone devices, but not all of these are useful to understanding how the device shapes users' communication practices. Of most use to understanding questions of device affordance is the mobile's user interface (UI). Differences in device UI may indicate the affordances and constraints of the device from the user perspective. The preliminary survey categorized devices through two distinguishing UI features: screen-size and primary mode of user input. Three categories were identified:

- *Type A*: devices with large screens and touch-screen input (e.g. an iPhone)
- *Type B*: devices with medium sized screens and QWERTY keyboard input (e.g. a BlackBerry)
- *Type C*: devices with smaller screens and numeric keyboard input

Participants were asked to select one of three simplified images (depicted in Table 2.) and identify what they used their device for. The results from this demonstrate that whilst all participants used their phone for calls and text messaging, there were differences in phone usage across the three device ownership groups. As seen in Table 2, those *mStories* participants who owned a Type A mobile device participated in more multimodal producing behaviors than those who owned other device types. None of the participants had ever used their device to create a mobile story before.




Hobbies, Interests and Motivation to Participate

Although writers' groups were initially approached, members from writers groups accounted for only one third (n= 3) of the final group. Whilst there were two professional writers in the group, other participants had a range of occupations (Table 3). Participants' hobbies were similarly diverse and included things such as photography, drama and acting, sports and outdoor activities. Interest in the project was gauged through the open question: "What interested you in: participating in the *mStories* project?" Participants' responses were coded thematically. From this coding three dominant themes emerged:

- *To be creative* (n= 5): e.g. "A chance to be creative and conduct my own e-show"
- *It sounds interesting or fun* (n=4): e.g. "sounds fun, interesting and a tiny bit silly"

- *It is different or new (n=5)*: e.g. “Writing a short story with a mobile phone isn’t something many people would consider and all the better a way to inject some stimulus into the writing world”

Table 2. Phone ownership and existing usage

<i>Literacy practice as categorized by the researcher</i>		<i>Activity</i>	<i>Participants’ Device Type</i>		
			<i>Type A n= 5</i>	<i>Type B n=1</i>	<i>Type C n=3</i>
					
<i>Multimodal and multimedia dominant literacy</i>	<i>Consumption</i>	Surfing the net	5	1	1
		Watching online video	2	1	1
		Downloading music or video	1	-	-
		GPS and maps	5	1	1
		Playing games	3	-	-
	<i>Production</i>	Taking photos	5	1	1
		Making videos	3	-	-
		Recording sound	2	-	-
<i>Both</i>	Social networking	4	-	-	
<i>Text dominant literacy</i>	<i>Reading</i>	Reading eBooks	2	-	-
	<i>Reading and Writing</i>	Text	5	1	3
		Email	5	1	-

3.2 Stage 2: Content Analysis

The completed mStories and their inclusion within the *mStories* website provided data about the media, genre and context that create the employed by users (Table 3).

Media and Mode

Of the nine creative stories generated by participants all stories employed the visual mode through either still or moving image. Text and image combinations accounted for the majority of stories uploaded. One example of this is “What am I wearing today?” a sequence of daily self-portraits that are accompanied by text offering the author’s personal reflections and comments (Figure 1). Participants demonstrated the ability to not only use different semiotics (e.g. image and text) but to combine these to create a single comprehensive semantic unit in which different semiotics “spoke” to each other. An

example of this can be seen in Figure 1., where the pronoun “this” (in the written text) can only be understood in relation to the visual image to which it refers.

Table 3. Participants, their mStories, media and device usage

ID No.	Participant/Author			Genre	Media	Context	Phone type
	Occupation	Sex	Age (Years)				
1	Fire fighter Sydney (Australia)	M	21 – 25	Documen- tary	Video	Journey from fire station to fire.	A
2	Writer Cambridge (UK)	M	26 – 30	Poem “iambic textameter”	Text Photo	Poem and photo inspired by view of a churchyard.	C
3	Fundraiser London (UK)	F	26 – 30	Themed Photos	Photo	Mornings in London taken from flat and commute to work.	C
4	Manage- ment Consultant London (UK)	M	26 – 30	Photo diary	Photo	Commute to work in London.	B
5	Accountant Sydney (Australia)	M	31 – 35	Mixed genre (Composite Diary)	Photo Video Music	Idealised Satur- day compiled of many Saturdays at markets, beaches, art galleries, gar- dens, and a fire- works display.	A
6	Interaction Designer Sydney (Australia)	F	31 – 35	Diary	Text Photo	A daily portrait and diary entry about the clothes a person wears.	A
7	Medical doctor neonatal intensive care Cambridge (UK)	F	31 – 35	Photo diary	Photo	Moments from a “special day” in London taken at markets, on the tube, in the shops, at the theatre and at home.	A
8	Writer and mother Sydney (Australia)	F	36 - 45	Short story fiction	Text Photo	‘Spooky story’ set in many dif- ferent locations: playground, the street, a pre- school classroom etc.	A
9	Researcher Sydney (Australia)	F	46 -55	Poems	Text Image	Poems set to photos of flow- ers.	C



Today it's raining when I woke up so I decided to wear this outfits:same jeans as yesterday; I only do laundry on the weekend so it's not unusual for me to keep wearing the same jeans for 3 days! ;-)

I have this wrap dress or cardigans that can be worn in 3 different styles (as you can see from the photos) sorry the lighting in my bedroom isn't very good. So I wear this today with black t-shirt underneath. Also have my long booths on today. Mainly because it's raining

Fig. 1. What am I wearing today? (Excerpt)

Genre

Several genres were represented, including a short speculative fiction story, poetry, documentary and diary forms. Photo or video diaries were the most common genre on the *mStories* website. However, whilst participants adopted various genres, these were appropriated in ways that subtly morphed existing conventions. One poem, written using SMS on a Type C mobile phone, was comprised of four lines of iambic pentameter. However, the author chose to refer to this as the iambic textameter, in recognition of the mobile technology. Similarly, the visible presence of the mobile phone covering the face of the author in the story 'What am I wearing today?' (Figure 1.) diverges from both the traditional conventions of portraiture, and the contemporary convention of a "selfie", which is a photo taken of oneself using a phone held at arm's length..

Though the diary genre was popular, these were sometimes part fiction in nature. One story, entitled "My Saturday" was a composite mix of photo and video from many Saturdays that formed a single narrative structured from morning to evening (Figure 2.). As a pastiche of photos, videos, sound recordings and music, the story of "My Saturday" resists clear categorization. Similarly, the question of what counts as poetry is challenged by the two poetic contributions, both of which use text and image. Given that the poem's meaning is bound to both modes, such content presents a challenge to existing definitions of poetry.



Fig. 2. My Saturday (excerpt)

Context

What is easily observable from Table 3 is the extent to which the stories reflect the context in which they are situated. Though Story 9 was a series of poems that reflected professional photographs of native Australian flowers, the eight other stories all directly reflect a dialogue between the participant and the mobile context in which they are situated. This dialogue can result in different outcomes. In Story 8 photos of local places in Sydney are rewritten by text into a spooky, speculative fiction. In ‘What am I wearing today?’ (Fig. 1), the participant’s choice of clothes is made in the morning before she goes to work; each photo reflects the time of that person’s experience, and their place of decision in front of the mirror.

3.3 Stage 3: Post-mStory Survey and Interview

The post-mStory interview and survey explored how participants’ created their story and made decisions about mode and process associated with generating that content.

Modal Choice

Participants’ choice of mode or media was principally motivated by the perceived needs of either the individual author/creator or the story itself. The dominant themes that emerged from the data were:

- *Practical needs*: “I wanted to illustrate the pace of my journey to work and needed something that was quick to use and easily accessible. The camera works on one click so I could get an image quickly without drawing too much attention to myself
- *Expressive needs*: “I thought about taking a series of photos and adding text but decided that the task could be accomplished more simply if I allowed the pictures and sound to speak for themselves”
- *Interest needs*: “I love photography. I thought it was a good way to register my day like a diary”

Participants were asked whether they supplemented their mStory with any content not created on their mobile phone. Two participants with Type C devices added photographs to their mStory: they chose to use a camera because of the perceived limitations of their device: One person’s phone did not have a camera, whilst one chose to use their camera to get a “higher quality of photo” than their phone allowed. Both said that the photo “added a great deal” to the SMS poems that they had written. In addition to this, two participants who created mobile video content with Type A devices resorted to their laptops to format their final submissions. Both participants found it to be too time-consuming and difficult to do on their mobile device.

Participant Process

In describing the process, participants were heavily influenced by the mobile context in which they created their stories.

- “I was inspired by the view out of my window...”
- “I wanted to give the impression that they were doing the commute with me”

However, whilst the mobile space provided creative impetus, the shaping of this into a meaningful story is a result of the individual’s own dialogue with that mobile context of use. This dialogue was inseparable from the individual and their personal motivations, interests, likes, and reflections. Thus, decisions on what to create a story about were driven by what the individual perceived to be interesting: e.g. “I wanted to create something fun and exciting”. Likewise, reflection on that environment also became an important part of this dialogic interaction. In one example, a fire fighter who used his phone to create a video story about his work describes: “Since making my mStory I have caught myself taking photos of things. I feel this is because capturing these things makes me aware of them”.

Did mLearning Occur?

Outside of an educational environment and in an informal setting, it is often difficult for people to recognise or articulate what they are doing in terms of learning. Asking direct questions on learning, especially within a creative project, is potentially problematic. However, from indirect questions such as ‘what did you gain from this experience?’ and ‘what did you like or dislike?’ qualities important for learning did emerge:

- *Self-efficacy*: “I gained a lot and I found that I gained the knowledge that I can think on my feet more than I think I can... And yeah that’s the thing I learnt [...] thinking on your feet you’ve got nothing backing you up. You’ve got no permission to write. And I was able to embrace that challenge and I was happy when I produced something that I kind of liked”
- *Adaption*: “On a computer at home I would have a research document, drafts [...] you can’t do that on a phone, so I had to produce something completely different.”
- *Reflection and metacognition*: “Since making my mStory I have caught myself taking photos of things. I feel this is because capturing these things makes me aware of them. The type of thing that became my mStory is fairly common, one that I normally experience and forget. Even though I still haven’t looked at my mStory since I created it, I still very clearly remember what happened, whereas I don’t remember half of the other similar instances. This is something that has also occurred with other photos since. I think capturing events has made me aware that things I find mundane, may, if looked at closely, actually be worth remembering.”

All participants reported to never having created a digital or mobile story prior to joining the project, yet all participants did create something entirely new. From this we can infer that learning, in an informal sense, did take place. However, gauging the extent of this learning is very difficult and constitutes a significant area for future research.

4 Discussion

When combined, the findings from the three stages of data collection allow us to form an elementary understanding of how the wider mobile complex affects new literacy practices. Whilst the design of the device may afford or constrain different multimodal uses, people are not technologically determined. Personal choice exerts itself, whether through the choice of device at purchase or the decision on which features and functions to use. Moreover, mobile devices cannot be considered in isolation from the individual’s wider ICT ecology of different technologies and contexts of use [26]. Within the *mStories* project participants turned to other devices to realize design intentions and overcome the limitations of their particular device. It is important to recognise that each individual’s personal ICT ecology is, to some extent, shaped by wider socio-economic factors such as cost, availability and access to different devices.

By opening up storytelling to multimodal methods and approaches, the *mStories* “writing group” was able to accommodate a diverse group of people: writers and non-writers. The dominance of visual content is supportive of a society that has shifted from a word-centric to a visual-centric culture [1]. Whilst the affordances of the device do allow for greater multimodal communication, participants’ choice of mode was motivated by the perceived needs of what they were creating. The final stories are highly designed, and show a high degree of sophistication in the way images, texts and sound are used to communicate. Participants’ stories simultaneously appropriate and challenge existing genre conventions. This aligns with recent research that suggests digital technologies may be changing the structure of stories and narratives

[27,28]. Situated practice was a recurring theme within all participant feedback; the mobile context of use provided creative stimulus to many of the stories. In contrast to other ICTs, the device's mobility provided new opportunities through which participants were able to be creative. Participants adapted their skills to engage in a new practice and engendered a greater sense of self-efficacy and engagement in reflective practice. These qualities are essential for learning.

Throughout this study several themes emerge to address the research question: "How can we best describe adults' informally acquired mobile literacy practices?" In answer to this, adults' informally acquired mobile literacy practices can best be described as:

- Multimodal
- Participant designed
- Situated
- Experiential and reflective
- Motivated.

5 Conclusions and Future Work

Mobile devices afford visual and multimodal communication; by embracing this, the *mStories* project was able to widen participation from that found at usual writers' groups. Mobile devices afforded situated, experiential and reflective practice that engaged directly with the mobile context of use. People came to this project, not as blank slates but as people with motivations, individual interests, attitudes and ideas, and used the mobile context as a place in which to be creative. When encountering a limitation in their mobile phone, participants readily turned to other technologies to fulfil their design intentions. This picture of mobile literacy is place-based, ecological and disruptive to our traditional notions of learning and literacy. Such findings may inform both practice and research in mobile learning. Moreover, from this understanding future research is better placed to address key questions about the acquisition of new literacies by adult users in informal settings, and how and to what extent informal learning occurs.

Acknowledgments. As a participatory project, this research would not have been possible without the nine participants.

References

1. Spencer, S.: *Visual Research Methods: in the Social Sciences*. Routledge, New York (2011)
2. Kress, G.R.: *Literacy in the New Media Age*. Routledge, London (2003)
3. Jenkins, H., Purushotma, R., Weigel, M., Clinton, K., Robison, A.J.: *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*. The MIT Press, Cambridge (2009)

4. Kress, G.R., van Leeuwen, T.: *Reading Images: the Grammar of Visual Design*. Routledge, London (2006)
5. Dyson, L.E., Litchfield, A., Raban, R.: *Exploring Theories of Learning and Teaching using Mobile Technologies: Comparisons of Traditional Teaching, eLearning and mLearning*. In: *mLearn 2010, Malta*, pp. 354–357 (2010)
6. Cope, B., Kalantzis, M.: *Multiliteracies: the Beginnings of an Idea*. In: Cope, B., Kalantzis, M. (eds.) *Multiliteracies: Literacy Learning and the Design of Social Futures*, pp. 3–8. Routledge, London (2000)
7. Jewitt, C.: *Multimodality, “Reading”, and “Writing” for the 21st Century*. *Discourse: Studies in the Cultural Politics of Education* 26, 316–331 (2005)
8. Kress, G.R.: *Multimodality*. In: Cope, B., Kalantzis, M. (eds.) *Multiliteracies: Literacy Learning and the Design of Social Futures*, pp. 179–200. Routledge, London (2000)
9. Spalter, A.M., van Dam, A.: *Digital Visual Literacy. Theory into Practice* 47, 93–101 (2008)
10. Sheridan, M.P., Roswell, J.: *Design Literacies: Learning and Innovation in the Digital Age*. Routledge, London (2010)
11. Mills, K.A.: *Shrek meets Vygotsky: Rethinking Adolescents’ Multimodal Literacy Practices in Schools*. *Journal of Adolescent & Adult Literacy* 54, 35–45 (2010)
12. Mills, K.A.: *A Review of the “Digital Turn” in the New Literacy Studies*. *Review of Educational Research* 80, 246–271 (2010)
13. Wolfe, S., Flewitt, R.: *New Technologies, New Multimodal Literacy Practices and Young Children’s Metacognitive Development*. *Cambridge Journal of Education* 40, 387–399 (2010)
14. Pachler, N., Bachmair, B., Cook, J., Kress, G.: *A Social Semiotic Analysis of Mobile Devices: Interrelations of Technology and Social Habitus*. In: *Mobile Learning: Structures, Agency, Practices*, pp. 185–204. Springer, New York (2010)
15. Fails, J.A., Druin, A., Guha, M.L.: *Mobile Collaboration: Collaboratively Reading and Creating Children’s Stories on Mobile Devices*. In: *IDC 2010: Proceedings of the 9th International Conference on Interaction Design and Children*, pp. 20–29. ACM (2010)
16. Lambert, J.: *Digital Storytelling: Capturing Lives, Creating Community*. Digital Diner Press, Berkley (2002)
17. Meadows, D.: *Digital Storytelling: Research-based Practice in New media*. *Visual Communication* 2, 189–193 (2003)
18. Nordmark, S., Frolunde, L., Milrad, M.: *Promoting the Creation of Digital Stories by Teacher Students: A Pilot Project on Curriculum Development in a Swedish Teacher Education Program*. In: *Proceedings of Society for Information Technology & Teacher Education International Conference 2010*, pp. 1153–1160. AACE (2010)
19. Ranieri, M., Bruni, I.: *Mobile Storytelling and Informal Education in a Suburban Area: A Qualitative Study on the Potential of Digital Narratives for Young Second-generation Immigrants*. *Learning, Media and Technology* 38, 217–235 (2013)
20. Sharples, M., Taylor, J., Vavoula, G.: *A Theory of Learning for the Mobile Age*. In: Andrews, R., Haythornthwait, C. (eds.) *The SAGE Handbook of e-Learning Research*, pp. 221–247. Sage, London (2007)
21. Coulby, C., Hennessey, S., Davies, N., Fuller, R.: *The Use of Mobile Technology for Work-based Assessment: the Student Experience*. *British Journal of Educational Technology* 42, 251–265 (2011)
22. Dyson, L.E., Litchfield, A., Lawrence, E., Raban, R., Leijdekkers, P.: *Advancing the m-Learning Research Agenda for Active, Experiential Learning: Four Case Studies*. *Australasian Journal of Educational Technology* 25, 250–267 (2009)

23. Pachler, N., Bachmair, B., Cook, J., Kress, G.: *Mobile Learning: Structures, Agency, Practices*. Springer, New York (2010)
24. van Leeuwen, T., Djonov, E., O'Halloran, K.L.: "David Byrne Really Does Love PowerPoint": Art as Research on Semiotics and Semiotic Technology. *Social Semiotics* 23, 1–15 (2013)
25. Frawley, J.: mStories: Exploring Modes of Participation in a Creative Storytelling Project. *The Journal of the Australian and New Zealand Mobile Learning Group* 1, 10–14 (2012)
26. Brady, F., Dyson, L.E.: A Comparative Study of Mobile Technology Adoption in Remote Australia. In: *Seventh International Conference on Cultural Attitudes towards Technology and Communication (CATaC)*, pp. 69–83. Murdoch University, Australia (2010)
27. Alexander, B., Levine, A.: Web 2.0 Storytelling: Emergence of a New Genre. *Educause Review*, 40–56 (2008)
28. Loveless, A.M.: *Report 4 Update: Creativity, Technology and Learning - A Review of Recent Literature*. NESTA FutureLab (2007)