

Constructing Intermodal Literacies

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ACM Technology Enhanced Learning, Milan, November 2003

The Everyday Learning group at Media Lab Europe invent tools and environments with and in which people can experiment with ideas, create things using computational materials, and make their creations public. We are interested in how these processes support people's learning through life – meaning through the lifetime and through day-to-day living, in everyday situations.

We call these "informal" learning situations. They differ from "formal" learning situations as you'd find in schools and professional training programs where, typically, someone external to the learner says not only what the learner should learn, but how to go about learning it.

Instead, we are interested in situations where learning is based on the learner's curiosity, where learners come because they want to rather than because someone tells them they should, and where learners have the freedom to pursue ideas in their own ways. Therefore we are interested in settings like homes, museums, zoos, clubhouses, community centres, airports, shopping areas and workplaces, and how we can help to shape these settings as informal learning environments that are welcoming, engaging and productive.

An important aspect of such environments is that they provide material and social supports for people to pursue creative activities centred around some core idea. For us this core is often a basic idea in math or science, because we are interested in how more people can develop thinking that will enable them to participate fully in our technological society.

In order to design learning environments that will be welcoming and meaningful for many people, we need to consider the broad diversity that characterises human thinking and knowing. This leads us to the design principle of representing ideas in multiple ways and at multiple scales. It also leads us to arrange unusual learning partnerships, such as between members of different cultures and different generations.

As we create tools to support these varied learning processes, we study how people go about using the tools to learn and to reflect on their learning, and this study in turn informs our design and development of the tools.

A current focus is on the question of how devices with limited power, bandwidth and screen real estate – but nevertheless with remarkable computational and multimodal capabilities – can render representations of complex information. We need to create entirely new vocabularies in text, audio, visuals, even haptics, considering how combinations of such vocabularies can best convey meanings to people who think differently from one another.

Several of our projects pose experiments with people’s expressions and communications through particular modal combinations. One example, *TextTales*, introduces the notion of a “short form” through its peculiar combinations of text and image. A *TextTales* display is typically projected in a public space. The large-scale display consists of 9 pictures in a 3-by-3 grid. Up to 3 associated captions appear under each picture. People send these captions via SMS text messaging. By sending a new caption, a participant augments the photo and states an idea or opinion about the image contents. When a new caption appears it replaces the oldest member of the triplet of text lines, refreshing the composite image and the extended discussion. Thus an everyday tool like a mobile phone becomes an instrument for expressing opinions and building ad-hoc communities of interest.



Left: The *TextTales* interface with 9 images and, for each image, the three most recently sent SMS text captions. *Right:* A *TextTales* installation in Dublin’s Fatima Mansions community. More recent installations create fora for discussing effects of environmental tobacco smoke and legislation that restricts smoking in public places.

Dwell for a moment on the idea that pictures together with texts – or even just pictures alone – could be the form of a discussion, extended or bounded. This is an important idea. It is not a new idea – Dondis, Berger and many others have dealt with the related notions of visual

literacy (Dondis 1973, Berger 1990/1973). But it is an important idea to re-think and expand as we enter an era in which many people will be able to communicate through images of different kinds and through images in combination with other modalities for expressing ideas. As inventors of new devices to support such representations and communications we would not presume to develop such schemes solely in the research lab. We work with potential users to develop the tools and contexts in which these new capabilities will become most beneficial for people.

In the TexTales project we work with citizens to create and arrange photographs that become bases for the displays and texting. The photographs concern issues relevant to people at specific times and places, such as renovation of low-income housing in an inner-city neighbourhood, tensions among factions within a rural community, and legislation restricting smoking in public places (Ananny et al. in press, Ananny and Strohecker 2002). Large-scale displays of composites of such pictures and associated texts are forming the centerpieces of public events in Dublin, Amsterdam and other sites. As we work with people to prepare these collections we are particularly interested in how the TexTales tool can facilitate communication between members of different generations and different cultures. The project is intermodal, intergenerational and international.

TexTales' combination of images with associated captions creates a new convention for expressing and forming ideas at personal and public scales. We have seen how people can become facile and fluent with this intermodal "short form", just as people learn to compose Haiku poetry, sonnets and short stories. Each of these forms has a unique structure that distinguishes it from longer similar forms, and each may have subcategories that enrich the definition of the structure and appropriate content. A writer decides to produce a short story instead of a novel for particular reasons and in producing the work follows through with compatible fine-grained decisions.

Associated with each short form are a culture and a craft that influence production and reception of examples. Traditions grow around and through the practice of generating examples of the form. There is a sense of purpose and quality associated with each. Just as a short story is a good match for quick reading on a commuter train and a novel suits leisurely reading at home or on the beach, various combinations of texts, sounds and graphics enabled by portable computational devices will emerge to reflect people's needs to express themselves in different places, along different timescales and among different people.

Unlike most established short forms, TexTales' entries are inherently pluralistic in their use of multiple lines of text and in their combination of texts and image. This pluralistic structure is compatible with pluralistic authorship reflecting and supporting community involvement. Relations of meaning between the lines of text, between

texts and image, and among participants are defining characteristics of this dynamic form.

Developing fluency with the form involves becoming deeply familiar with these relationships. We have identified some of these relations as textual references to a particular picture, person or place, texts intended to begin or continue a "conversation", texts that are signed or anonymous, and texts that function as commentary or graffiti. As people experiment with such relations between and among texts and images, they deepen their engagement with the display, with each other and with the co-constructed ideas represented in the projection.

We believe this sort of familiarity, facility and fluency constitute a kind of literacy, an "intermodal literacy", for which *TexTales* provides just one example. We are exploring other examples as we create possibilities for interactivity through multimodal interfaces. Each of the various interfaces contributes to our understanding of visual, aural, and tactile symbol systems, how they can work together and how people can use them as an expressive language. This examination of synergies among representational forms is consistent with our goal of supporting learning through expression and construction.

The design strategy of creating multiple representations is compatible with technological developments that challenge us to consider how portable devices with limited power, bandwidth and screen real estate – but nevertheless with remarkable computational and multimodal capabilities – can render representations of complex information. We need to create entirely new vocabularies in text, audio, visuals, even haptics, considering how various combinations of such vocabularies can best represent meanings created by and conveyed to people who think differently from one another. Peoples' development of such intermodal literacies becomes another aspect of our research.

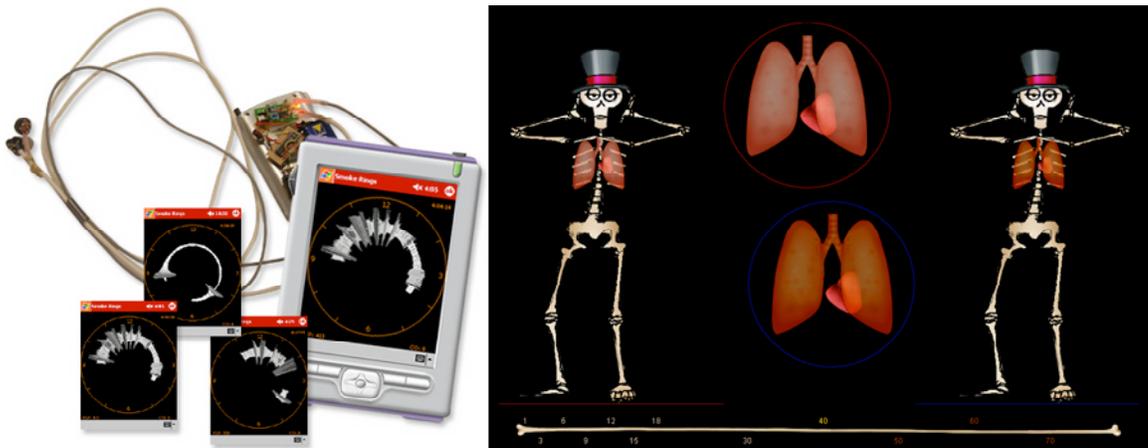
Certain precedents inform this work as we consider the constraints and benefits of tools for mobile learning. Picture phones and sensor-enhanced PDAs may lend themselves to the concept of learning-on-the-go, but learning is complex, and informational forms on mobile devices need to represent ideas succinctly. The representations need to be concise but richly expressive.

In order to understand and address this need we are looking to precedents: Haiku poetry, sonatas and short stories as noted above, and also sonnets, telegrams, e-mails, "concrete poetry" (for which e. e. cummings provided the quintessential examples) (Cummings 1994), certain games, photo essays, magazines emphasizing the role of captions, and silent or subtitled films. Each of these examples provides an opportunity to examine a particular mode or modal combination relevant to our study of how people develop intermodal literacies: we consider rhythmic sounds, music, spoken words, words arranged as text – at times in so deliberate a fashion as to become image-like – text combined with still and moving images, and games that become forums

for playing with notions of co-construction and discernments of the public and the private.

In addition to experimenting with such representational schemes we are acknowledging that the nature of the interactivity with a mobile intermodal device affects potentials for personal engagement, collective contribution and therefore an overall learning experience. In some projects we are complementing interactions in an immediate temporal and spatial sphere with interactions through partnered devices in a subsequent time and place.

TexTales is an example of such a “collect and reflect” interface: community members create photographs and seed captions which they and others later augment, echo or otherwise play with through texting in a public forum. In another project, Smoke Rings, users collect readings of environmental tobacco smoke through a sensor-enhanced PDA and later upload the data to a simulation environment that projects long-term health consequences of sustained exposures (Strohecker et al 2003).



Left: A wearable monitor detects and registers variable levels of constituents of environmental tobacco smoke. *Right:* The clock-like logs can be uploaded to a simulation environment where users can see potential effects of sustained smoke exposures. The visualisations resemble x-ray images of changes to the hearts and lungs of user-created cartoon characters as they progress from infancy through old age. Each character appears twice, one registering projections from studies supported by medical communities and the other registering projections from studies supported by interests of the tobacco industry. Guess which one appears healthier.

Another project, Nature Trailer, uses GPS, sensors and map overlays to create a handheld tool that graphically informs hikers of changing weather conditions and provides stories told by people who have experienced similar conditions at the varying locations. Later, the hiker can view and augment traces of the exploration (Donovan et al. 2003).

We believe that rich representation and interaction schemes can help mobile communications devices to transcend gadgetry and transform learning as a pleasurable, constructive, everyday experience.

Acknowledgements

We thank Kathleen Biddick for her collaboration leading to early installations of TexTales and discussions reflecting concerns related to the notion of intermodal literacies. We also thank Sile O'Modhrain, Helen Doherty, Larry Friedlander, R. S. Steinberg, Vicki Porter and members of the Everyday Learning group at Media Lab Europe for such discussions.

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