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Context at the Crossroads of Language Learning and Mobile Learning

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Abstract: Contextual learning is the next step in the development of pedagogy in relation to mobile and ubiquitous technologies. The question addressed in this paper is whether research on 'context' within second language learning, and in the language sciences more broadly, can inform the development of the notion of context in research on technology-enhanced learning and mobile learning. As researchers in mobile assisted language learning, we stand at the crossroads of these disciplines. In this paper, we indicate the main sources and research directions that inform our work; we share our observations and propose some tentative conclusions.

Keywords: mobile learning, contextual learning, language learning, second language acquisition, situated learning

Introduction

In many disciplines, effective learning only takes place when knowledge is applied, tested or elaborated in context [1]. With access to the right technology, early stages of knowledge acquisition can also be initiated more easily in context. Understanding and supporting learning in context is a priority for developing the next generation of personalized mobile learning technologies.

When context-appropriate information is readily available and learners are engaged in creating and sharing contextual resources, learning can potentially become more effective and efficient. Context can then assume the role of enabling learning, i.e. actively motivating and instigating new learning, connecting with a vision for the future of language learning based on "context, continuity, and openness to the unexpected" [9]. However this requires a rich notion of context, engaging with the idea that context is continually created through the situated interactions of individuals and groups with their social contacts and aspects of their physical environment. Furthermore, within an intercultural approach to foreign language education [3], learners can be regarded as ethnographers, capable of developing not only linguistic but also cultural skills, such as understanding the explicit and implicit cultural goals of a foreign language community, through active recording, observation and discussion. All this raises questions as to what is appropriate and acceptable behaviour in a particular pedagogical culture or social environment of technology use. It also necessitates an understanding of the cultures of mobile device-enhanced lifestyles [8].

We are interested to explore whether research on 'context' within second language learning, and the language sciences more broadly, can inform the development of the concept of context in research on technology-enhanced learning and mobile learning. As researchers in mobile assisted language learning, we stand at the crossroads of these disciplines. Kukulska-Hulme & Bull [10] have already noted that "there is a large body of research on many aspects of second language learning, but often much of the relevant theory and empirical findings are overlooked by developers of language learning technology support" (p. 1). We seek to understand how cultural imperatives and existing pedagogical approaches may be determining the development of mobile language learning in different parts of the world. In this paper, we indicate the main sources and research directions that inform our work; we share our observations and propose some tentative conclusions.

1. Context in the language sciences

Since our target learning domain is language, we consider here what insights or resources can be gained from the language sciences concerning the role of context in language and in language learning. The breadth of the field of linguistics (both theoretical and applied) prevents a detailed survey here. What we aim for instead is some perspective to help ground the applications of mobile technology for language learning.

Language is fundamentally a tool for engaging in communication, or for what Halliday frequently refers to as semiosis or 'meaning making' [6]. One of the central traits which renders language suitable for producing and interpreting meanings is that it is patterned. This holds at virtually every level of analysis of language, from patterns that govern the concatenation of phonemes and morphemes on up to those that govern the turn-taking in conversations or moves in written discourse. Regardless of the unit of analysis, a central task in linguistics is the uncovering of such patterns and the rules or principles that give rise to them. Similarly, one task of a language learner is to become sensitive, whether consciously or unconsciously, to the patterns or the rules that yield the patterns.

One of the central insights of Saussurean structuralism is that a language can convey meanings due to its nature as a system of relational contrasts. In fact, any semiotic system works this way. A red light means *stop* because it stands in relational contrast to another possibility in that traffic system: a green light, which means *go* by virtue of its contrast with the red light. In a culture (or semiotic system) where a ring on a specific finger of a particular hand (the left hand) means that the wearer is married, then the same finger with no ring can convey meaning as well, indicating the person is single. Illustrating this at the level of grammar and morphology, consider the phenomenon of subject/verb agreement. Of course the following English sentence contains a marker of subject/verb agreement:

She likes the new car.

The grammatical agreement is expressed by the –s ending on the verb *like*. But a Saussurean perspective reminds us that in fact there is no subject/verb agreement displayed in that sentence at all. The agreement is detectable only within a paradigm of related alternative

possibilities that are absent from that single visible sentence, specifically the paradigmatic contrast of *She likes* with *They/You/I/We like*. Imagine that, unlike the English we know, the following sentences were all perfectly grammatical English:

> *She   likes the new car.*
> *They   likes the new car.*
> *We   likes the new car.*
> *I   likes the new car.*
> *You   likes the new car.*

If these were English sentences, then we would have to conclude there is no subject/agreement marking in *She likes the new car* because there is no contrasting form alternating with *likes* there. Hence the agreement resides not in any single sentence or clause we encounter but in the relationship we ascribe between that and its unseen paradigmatic alternatives.

This insight problematizes the role of context in language use and language learning. Specifically, a proficient language user grasps the patterns of a language and thus creates or finds meaning not simply by relying upon what is spoken in an utterance or written in a text, that is, not simply by relying on what is 'there' in a context of use, but by depending on the contrast between what is spoken or written and what could have been but is not. This entails that much of what makes communication possible is objectively undetectable in the material context and exists abstractly in this system of contrasting possibilities in the minds of the participants. This works at all levels of the system, from grammatical features of agreement to the discourse and pragmatics of politeness ("Wait a minute" sounds rude from a clerk because it contrasts with an alternative expression of the same meaning: "One moment"). Seen from this perspective, what characterizes learners or novices and distinguishes them from 'experts' or proficient members of a speech community is their unawareness of these invisible alternatives.

We would like to propose that this allows us to frame one of the basic needs of a mobile, situated learner in a way that suggests how mobile technologies might aid them. The crucial limitation of the unaided learner 'in the wild' is his or her unawareness of the underlying paradigms that imbue the speech or text at hand with its meaning and significance. We can imagine then how the same learner with mobile technologies in hand might be scaffolded into such awareness right there 'in situ'. This gives some substance to the notion of 'contextually appropriate' content. Broadly stated, the device can be seen as a means for rendering visible what is crucial but otherwise invisible to the uninitiated learner. Whether this would be done by smart devices that are context aware or by human experts made accessible to the learner by the technology is a rich area for discussion and experiment.

Here we can only scratch the surface of the language sciences and their potential relevance to mobile learners. Variations of the theme we have sketched so briefly above are elaborated in fine detail in various frameworks of linguistic research. Halliday's voluminous writings on systemic-functional linguistics ([6] inter alia), the sociolinguistic literature on ethnography of speaking [7] and ethnography of communication [13] are just a few that hold promise for

those seeking well-motivated means of framing the contexts of situated language learners beyond the walls of the classroom.

2. Context in mobile learning

In this section, we give an indication of current research on contextual mobile-supported learning, both in terms of theoretical work and by discussing some examplar projects.

Theoretical work on context in mobile learning comes from two different perspectives: a pedagogical perspective and a more technical one. The pedagogical perspective includes ongoing research on flexible and learner-generated contexts in relation to mobile learning [2][11]. In a recent short contribution to a conference on open content, Luckin et al. [12] explain their interest in "participative technology" and the potential for learner-generated contexts:

> The proposal of a Learner Generated Context arose initially from the suggestion that an educational context can be described as a learner-centric ecology of resources and that a learner-generated context is one in which a user or group of users collaboratively marshal the available resources to create an ecology that meets their needs…Through the discussions of the Learner Generated Context group, fresh perspectives on this contention have developed. For example, both spatial and process issues emerge. These could be described as Changing the learning context and generating learning spaces, and Changing the learning process and the learning context. (p. 80).

From a technical perspective, context-enabled learning is a significant extension of current location-based approaches, integrating personalised interaction and adaptive content with context identification and detection technologies including personal task and goal context, location context, object identification and tagging, time, and social context [4][5]. In an effort to align technical developments with developments in pedagogy, De Jong at al. [5] have developed a 'reference model for contextualised media' which they use to identify limitations of current applications and to discuss new solutions and challenges for contextualised learning support. The model consists of five dimensions: content, context, information flow, purpose, and pedagogical model. The usefulness of these dimensions is explained as follows:

> By combining different values for each dimension, various forms of contextualised software can be created for different purposes and with different pedagogical underpinnings. For example, a system with a main purpose of *sharing content and knowledge* between its users, can be described by using *documents* from the content dimension, *relations context* to describe social relations between the users, and a many-to-many information flow. (p. 6)

In the remainder of this section we give examples of recent projects in contextual learning, from among papers submitted to the annual international mobile learning conference, mLearn'08:

Title: ERA: on-the-fly networking for collaborative geology fieldwork
Context: science in universities – undergraduate geology fieldwork
Technology: lightweight wireless ('on-the-fly') network for transmission of video, audio and images; planning to use VOIP and wireless digital cameras
Pedagogy: remote access and collaborative groupwork. A mobility impaired student directing a remote geologist in the field; half of the student group is in a university lab and half on location.

Title: Mobile learning in the museum landscape: supporting higher education
Context: design education – V&A museum in London – bridging museum and university learning
Technology: web-based trails accessed on PDAs inside museum
Pedagogy: construction of a learning experience; learning as dialogue between learner and environment. Users can input responses (photos, text, voice), creating a personalised trail that can be accessed on the web after the visit.

Title: Art Mobile – a new experience in the fruition of the artistic patrimony Context: tourism/ art/ general public; mobile guide to the art contained in a church in Milan
Technology: Pocket PC with Art Mobile application
Pedagogy: concepts and approaches from art theory, e.g. 'mediated fruition'; development of Learning Objects. Users choose among various types of information, including historical, artistic, hagiographic and anecdotal.

Title: Some considerations on a mobile learning experience in a secondary school
Context: tourism as part of school learning - tourist guide/trail creation activities in a city
Technology: MoULe system (mobile and ubiquitous learning) – an online Web 2.0 type environment with mobile functionality; smartphones with GPS provided
Pedagogy: collaborative learning; sociometric testing to determine student groupings; some reflections on knowledge building. Some collaboration between students in class with students outdoors.

Title: Learning 21st Century science in context with mobile technologies
Context: science in schools - science learning across classroom, sports hall and library – learning about fitness
Technology: heart-rate chest strap, handheld visualisation tool, and web-based analysis tool for data analysis in class
Pedagogy: 'scripted inquiry learning' across contexts; critical incident analysis. Targeting support for learning in different locations within a school, and potentially at home.

Title: MiLK: students building mobile learning games in everyday places
Context: science in schools/ games - Adelaide Botanic Gardens; learning outside the classroom
Technology: MiLK - an authoring tool allowing students and teachers to create and share SMS games for mobile phones. There is a social networking element as well, via student 'profiles' showing games played, event journals, discussion and commenting tools etc.

Pedagogy: constructivist and connectivist teaching methods; ecological paradigm; personalised learning discussed. Students design their own learning game, play it and critique each other's games.

Conclusions

One of the basic challenges to creating effective mobile language learning applications lies in how context is to be construed so that it can be exploited for the benefit of the mobile leaner situated in authentic, noisy conditions. While technologies can deal most straightforwardly with features that are concretely present within the material context of the learner, the insight from language sciences is that the most crucial features of context for communication are abstract and not directly susceptible to capture and delivery by mobile technology. Clearly this basic insight does not lead directly to concrete prescriptions for how to create contextually appropriate assistance to learners, but we offer it here as one ingredient which we hope will enrich the scholarly discourse and actual design research on mobile language learning.

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