

# Language learning on the go

Hayo Reinders explores the potential of location data for language learning and teaching.

This brief article describes current developments in location-based technology and services and their potential for language learning and teaching. Mobile phones and, increasingly, other devices make use of GPS and alternative technologies to determine their position. This can provide users with information that is relevant and timely to the context they are in. For language learners this can be particularly helpful as their location can be used to provide them with domain-specific content (for example, vocabulary) and opportunities for situated learning. Below, I will briefly review current and emerging technologies, before discussing some practical ways they can be employed in (supporting) language learning.

## Location-based technologies and services

Most readers will be familiar nowadays with GPS technology. Global positioning satellite systems have been in existence for many decades but have in the last decade grown tremendously in importance for individual users<sup>1</sup>. This is largely due to their embedding in portable devices such as navigation systems and, in recent years, mobile phones. This has led to the development of services that use the location

data to provide users with all sorts of useful information, such as the whereabouts of their friends, their own location in an unfamiliar city, the nearest hospital, and so on.

But GPS technology<sup>2</sup> is not restricted to use with mobile phones and similar devices. Increasingly, technology is embedded in everyday objects such as company cars (for fleet management), art works (for theft protection), even in pets, and indeed humans. As more devices can transmit their location, the more this information will be used for all sorts of services. And location data is not only dependent on having a satellite lock; assisted GPS helps even when no (strong) GPS signal is available, for example by using wifi networks, or the position of a device relative to nearby mobile phone towers.

GPS is not the only technology that can help to determine location. RFID, or radio frequency identification, uses simple radio signals to receive and send information, including location. Many readers will have used RFID cards to access their office or perhaps have one on their car window to enter toll roads without stopping. What has changed is their price; they can now be produced for as little as a few cents, which makes it possible to embed them

into many everyday appliances and goods, such as luggage tags and library books. Experimental uses not too far on the horizon include embedding such tags in items like milk bottles. When the bottle is nearly empty it communicates this information to the local network, which adds it to your shopping list. RFID tags are particularly useful for determining the position of items or people that come into contact with it; a photocopier is not likely to move around much, but the people using it are. Information about who is near may lock or unlock certain functionality, for example. RFID is particularly useful indoors, where satellites cannot reach without special tools such as GPS repeaters, and as a very cheap means of connecting items with networks.

Many services and products have developed around the availability of location data. Examples include maps that show the user's position and can give directions interactively. The user's location can be shared with others, for example through tracking services such as Google Latitude. 'Check-in' services such as Foursquare and Yelp let users share their location publicly, or discriminately with selected other users. The relationship between location and object works both

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## FOOTNOTES

- 1 They have also become vastly more accurate during that time. It is now technically possible to determine someone's position to within a centimetre.
- 2 GPS is not the only satellite based system to provide such services. Galileo (Europe), Compass (Chinese), and GLONASS (Russian), for example, are alternative satellite navigation systems. As most readers are most likely to use GPS services, I will focus on these here.

ways. For example, shops can send out information when they know a previous customer is nearby.

### Location and learning

What implications does this have for education? The short answer is ‘no one knows’. The potential of location data for learning and teaching is only just starting to be explored and the near future will doubtless see the development of a greater understanding of its benefits and drawbacks. Broadly speaking, though, two areas are starting to emerge where mobile technologies can play a role; in facilitating access to information and (learning) resources, and in supporting students’ actual learning. An example of the former is a particular location triggering the broadcasting of specific information. For example, schools and universities can send out information to students as soon as they enter a particular part of the campus.

Libraries can broadcast opening times, or user-specific information, for example about overdue books. Lecture theatres can broadcast information relevant to the lecture scheduled in that room at a particular time, such as reading lists. These are all examples of *geofencing*, which involves the demarcation of an area, or a building, entering which triggers certain information to be sent out. This applies not only to schools but to all sites. An historic building can broadcast information about each of the different rooms, or objects within them. Individual plants and trees in a botanical garden can send information to visitors about their names or origins.

In addition to location information that is not created or broadcast by a particular site or institution, there is an enormous amount of data available through map programs, such as Google maps. Users can add their own data in different ‘layers’, which can be turned on or off. For example, environmental researchers may add data about air quality in a separate layer, or government

agencies can add data about crime rates. This information can be drawn on for educational purposes; students can look up information, but also add their own. For example, students can take air quality samples for a particular area and upload it.

Another tool that can help to draw on location information is Augmented Reality, or AR for short. AR is simply the overlaying of location data with other information. For example, when looking at the Eiffel Tower through a mobile phone’s camera, information about the Tower’s history, current events, opening times and so on are presented together with the image. The potential for education is only just starting to be explored and is an example of the use of location data that can promote learning that is ‘just-in-time’, available when it is needed, and also connected, in the sense that the overlaid information can be edited by the user, and shared with others. Learning thus becomes not merely accessing information, but co-constructing it.

### Location and language learning

The above programs and services are interesting but the question is to what extent and in what ways they can be harnessed for supporting *language* learning and teaching. One early example of the use of location information is an innovative study by Ogata & Yano (2004). In their study, they attempted to provide L2 learners of Japanese with the right vocabulary and expressions, depending on the context they were communicating in.

Japanese uses different forms of address depending on the social distance between interlocutors and the formality of the context they are in. In the study, participants were given mobile devices that could detect whether participants were in a lecture room (formal) or canteen (informal), and whether they were communicating among students (informal) or between student and lecturer (formal). Depending on the

situation, learners would receive the appropriate language on their mobile device. At the time of the study, it was challenging to develop this type of system. With current technology such as the increasing use of GPS repeaters and RFID and ubiquitous wifi, it should become easier to design support systems such as this, which could be used to provide learners with all types of linguistic, cultural and background information.

In a different study, Beaudin et al (2007) explored the use of ‘ubiquitous sensing’ in the home for context-sensitive microlearning. Hundreds of objects in the house had sensors built in and stuck onto them and these would detect motion and then read out phrases in both English and Spanish. A married couple lived in the house for four weeks and interacted with these objects as they went about their everyday business. Phrases were presented on average 57 times an hour. The participants did not find this high level of interaction overwhelming. The benefits for learning were not directly measured but the participants reported enjoying the many opportunities for ‘micro learning’.

Of course, projects such as these are beyond the practical means of most busy language teachers. However, many more straightforward uses of location data are possible. Below are some suggestions that are easier to implement.

### Directions, field trips and quests

One of the simplest uses of GPS data is to practise giving and receiving directions. Students could start off in different locations and, using maps and/or navigation software, work their way to a common point, possibly in the form of a competition with the first team to arrive winning. Related to this is to use location data for field trips where students have to go and collect information about a particular building, person or topic. This could include going to a local museum, finding historical buildings around town, or locating (and perhaps interviewing) a particular person.

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More extensive activities are quests, similar to those in digital games (Reinders 2012). These combine instructions with information provided by the teacher or that students have to find themselves. Usually quests involve students working together in pairs or small groups, collaborating and sharing information. One activity I have used is the ‘mobile hunt’ in which two or more teams are given different instructions and retrieve information from around town (this could of course be limited to just one campus, for example). In order to solve a problem, students have to share what they have found, working together to collate and compare the pictures, notes and recordings they have collected and then work out how to use that data. I have heard of teachers hiding QR codes (graphic codes that can be read with a phone’s camera and hyperlink to online information) in various locations.

### Maps, map overlays and geo-tagging

Above I have already mentioned ‘layers’, information that users overlay on maps. Students can read these layers when moving around and gather information, and then report these in class. Of course, students can also write these overlays themselves and share them with other students.

Programs like Google Maps let users choose who to share map overlays

with. For example, first year students can write overlays for next year’s students with tips on where to go, how to find their way around campus, and the best places for coffee. More directly related to what is covered in class, they can be asked to tag examples of certain vocabulary items, or even examples of the use of a particular grammatical feature (e.g. on restaurant menus, library catalogues, or anywhere else for that matter). Such noticing ‘on the go’ of target language features in authentic contexts has been suggested to have significant learning benefits (Kukulska-Hulme & Bull, 2009). Of course, teachers can also create this information, and include pictures, links, and even specific vocabulary items or study tips (Bo-Kristensen et al, 2009).

Map overlays are in fact one form of geo-tagging, which involves combining location data with other information. Pictures, for example can be shared with others, with their GPS coordinates embedded in them, making their location visible to others. Students can share, describe and compare these images, guess where they were taken and then compare that against the location data. Other data that can be geo-tagged includes Tweets and other social networking posts, to share where certain information was posted. For example, a user could comment on a movie or a concert as it happens, sharing the location with others.

### Personal location sharing, check-in services

There are a number of programs that let users share their personal location. Google Latitude and Instamapper for example let users track friends and choose whom to share their own location with. New classes could share their location during orientation periods to get to know each other. Another way of using this location information is for one group of students to head out and for another to stay in class, tracking the first group’s location, and perhaps sending out instructions (e.g. via text message) with tasks for the group to complete.

Check-in services go one step further and allow users to let others know they have visited a particular place and find out recommendations about other, similar, places. Students can use this type of service to write reviews of places, read others’ comments and in this way practise ‘real-life’ reading and writing skills. Of course, teachers can create their own locations and leave information and questions for students to find there and respond to.

### Augmented reality

Above, I have already described Augmented Reality. Its benefit for language learners is obvious; instant visual information overlaid on real-world objects can help with vocabulary acquisition, and encourage students to read more about objects and places, thus encouraging greater engagement. Less obvious is the potential for learners to create their own AR experiences, writing and sharing, collaborating and revising information for other users, either classmates, or the general public. In this way, the purpose of the writing is authentic, with real-world implications. It is not hard to think of homework tasks involving information-gap activities where learners contribute different information they have found outside the classroom and then collaborate to combine this.

There are several programmes that offer AR, currently one of the more popular ones of which is

*Layar*. Users simply use the camera feature of their phone to get instant information about the object they point at; restaurant reviews, historical data, opening times, etc.

*Wikitude*, one of the earliest AR applications, is similar, but pulls information from Wikipedia.

Another is the Google project ‘*Goggles*’, which is similar but has the advantage of being able to retrieve results directly from Google’s search engine. In addition to also reading barcodes, it will translate from many dozens of languages into any other language.

One activity that I have used in the past is the ‘virtual tour guide’, where students create directions, map overlays and AR data to guide other students on a tour, with voice recordings, pictures, text and even video for others to use when completing the tour.

## Conclusion

Location data has a number of potential advantages for learning in general and language learning in particular. Location is a highly personal asset and any information or support provided that is specific to a particular time and place is likely to be directly relevant to the learner.

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If information about a location is connected with information about the individual learner, then highly personalised information and support can be offered at the time of need. The benefits of situated learning have been amply demonstrated in general learning, and also in language learning (Hall, 2002, Lantolf, 2000, Ohta, 2001); information that is encountered when it is needed is more likely to be retained.

Similarly, information that is acted on is more likely to be remembered. Location data is often available in particular situations where that information is needed to solve an immediate problem. When combined with the ability of many location data services to connect users and learners to others in similar situations, for example, opportunities for sharing and collaborating increase. The benefits of collaboration have been demonstrated for language acquisition (e.g. Swain & Lapkin, 2001).

Although connecting personal and location data for language learning is in its infancy, I hope to have shown above that both simple as well as more complex activities are possible to implement for language teachers, without specialist skills. The major potential of this lies in increasing opportunities for informal language learning; learners spend more time outside the classroom than in it. If

relevant linguistic information and learning support are available to learners anywhere, then opportunities for learning increase as does learners’ likely engagement with the language learning process and their time on task.

There are some drawbacks to using mobile phones and location data, in particular relating to security, privacy and cost. Especially with younger learners, security is a major issue. Clearly, children cannot be sent on ‘mobile quests’ or otherwise leave the school unattended. However, students can be asked to report on locations they have visited outside school hours, and perhaps take photos, or record and share their geotagged notes. Not everyone, parents and school administrators, will be happy for students to share data about their activities outside of school, and may worry about location data being shared with strangers and possibly abused. Privacy is clearly a major concern. As with email when it first arrived, text messaging, and social networking, the solution is not to shut down access to new technologies, but rather to inform and empower learners to engage in safe mobile activities. This means showing them what information is shared with whom, and how to limit who can, for example, see your location.

Finally, not all students have mobile phones with location capability. Although this is becoming less common as even basic model phones now offer quite advanced functions, it is not possible to simply assume that every student has access to their own phone. I have successfully worked around this problem by having small groups of students share one or two phones. Another issue is the cost associated with mobile data; although GPS connections do not use up mobile data, displaying maps, and using apps, does. Unless students are on generous plans, the costs can be quite high. The alternative is to use wifi where available.

Despite these potential drawback, the potential benefits are considerable; using a device that most learners carry with them most of the time and getting them to use it to interact with the



target language in location-specific and highly contextualised ways offers great opportunities for making learning more engaging and for encouraging informal learning beyond the classroom.

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### Some suggested programs

*Checkin services:*  
www.foursquare.com  
www.yelp.com

*Location services:*  
www.google.com/latitude  
www.instamapper.com

*Augmented reality:*  
www.google.com/goggles  
www.layar.com  
www.wikitude.org

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