

## Chapter 19

# Contextual Learning and Memory Retention

### The use of Near Field Communications, QR Codes, QBIC, and the Spacing Effect in Location Based Learning

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#### **ABSTRACT**

*An important part of multiplatform or blended learning is designing learning environments that take full advantage of the relative strengths and weakness of the various platforms employed to meet learning objectives. The desktop has strengths that are conducive to immersive learning environments, whereas mobile devices excel in contextual learning and performance support roles. Blended learning then, is not merely porting the same content from one platform to another, but recognizing the need for unique implementations. This chapter will examine two general applications in which mobile learning takes advantage of the flexibility afforded by the platform. In the first case we will explore the possibilities presented by physical hyperlinks through the use of Near Field Communications, QR codes, and image recognition software. In addition to providing contextually relevant information, the mobile platform is ideal for providing enhanced conceptual retention. The Spacing Effect demonstrates that memory decays according to a well-defined logarithmic curve. Once this curve has been optimized for an individual, it is possible to determine the most productive times to review learning objectives. Mobile devices are the perfect platform to review material initially mastered on a desktop or in a classroom, and these scheduled sessions can boost retention times dramatically. Contextual Learning and Enhanced Retention are two applications that cater to the strengths of mobile devices, and augment a holistic multiplatform approach to learning.*

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## **INTRODUCTION: THE VALUE OF BLENDED LEARNING**

Within the field of simulation & training, the value of increasingly immersive environments is readily apparent. The ability to accurately model reality and provide the user with artificial stimuli allows for the simulation of educational experiences that would be either too costly or too dangerous to conduct in physical space. This approach to technology enabled learning represents one distinct end of the spectrum, where the physical world is largely or entirely replaced by a digital recreation. At the other end of the spectrum are educational experiences that also rely on digital information, but the use of this information is intended to augment, rather than replace, physical space.

Mobile technology provides us with the tools necessary to allow for “contextual learning.” And this approach, which situates learning objectives firmly in their operational context, can provide results and capacities that are not easily achieved with traditional methods.

However, the use of mobile technology in learning is a distinct tool that achieves its greatest potential when used as one component of a multiplatform approach. The strengths of a mobile device, accessibility and portability, can also be liabilities depending on the nature of the educational objective. But if classroom, desktop, and mobile approaches can be integrated to reinforce each other by capitalizing on the strengths of each, then dramatic increases in efficiency and efficacy are possible.

## **BACKGROUND: LOCATION BASED AND CONTEXTUAL LEARNING**

One of the key advantages of the mobile platform is the ability to access a learning objective from any location and at any time. A recent study published in the *Australasian Journal of Educational Technology* (Pettit & Kukulska-Hulme, 2007)

describes how many users in urban areas found their daily commutes to be one of the best times to study educational content on their mobile device. This unparalleled accessibility lowers the barriers for short learning experiences and encourages frequent interactions. A mobile learning session can be very spontaneous as opposed to traditional classroom instruction that requires a tremendous amount of organization and planning to implement.

Typical classroom teaching sessions are scheduled several months in advance. Likewise, web based seminars rely on rigid scheduling, although by distributing the audience they allow for much wider participation. Both forms of instruction enjoy unique advantages but they incur a high opportunity cost in terms of the required commitments from the instructors and participants.

The mobile learning environment is radically different. The typical user interacts with their mobile device frequently (several times an hour, but only for a few seconds at a time). These brief interactions can be used to provide valuable learning experiences, but they must be structured very differently than those designed for other formats. Specifically there are two considerations that should characterize mobile learning content. The first is a streamlined user interface. Even the simple entry of a URL can be so disruptive to the mobile experience as to present an insurmountable barrier to the typical mobile user. The second consideration is the contextual and temporal relevance of the content. In general, there should be some compelling relationship between the mobile content and the users physical location to create an effective learning experience. One exception to this general principle, which will be discussed later in the chapter, is the temporal relevance of scheduled review sessions.

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