Identifying learning effectiveness of context-aware ubiquitous learning with the phenomenological method:
A state-of-the-art review

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Abstract
Context-aware ubiquitous learning (u-learning) is an emerging field of learning technology, and it provides new educational practices for knowledge development and transfer, which are vital for written and oral communications via language. To date, most u-learning studies aimed at the applications in different academic and industrious fields as well as the evaluation of learning effectiveness via various ubiquitous computing devices (including PDA, smart phones, wireless communication, RFID readers and sensors, or QR codes); however, few studies focused on the analysis and formation of learning models in u-learning. In order to give a clear theoretical concept of u-learning for future educational research and development, the authors of this paper explored how learning effectiveness
could be identified via u-learning surroundings, u-learning design, and human-computer interaction in recently published studies. The authors collected and analyzed u-learning studies published in 2005-2011, and followed the procedure proposed by the phenomenological review method, including (a) identifying meaningful statements, (b) giving meanings to those statements, and (c) creating thick descriptions. Finally, the authors reported the current developments in u-learning, and provided the connection between learning effectiveness and u-learning design and surroundings. The result demonstrated that the successful u-learning originated from the personal and strategy-based learning design; furthermore, the design factors would influence learners’ recall, learning achievement, and motivation. Moreover, the review study also revealed that proper u-learning design would increase learning effectiveness, and interested researchers might apply the identified learning model behind the u-learning design as a consideration to construct or refine their u-learning.