APPLYING LEARNING THEORY TO MOBILE LEARNING

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TD at Work ISSN 2373-5570, Electronic ISSN 2373-5589, ISBN 978-1-56286-977-9, Electronic ISBN 978-1-60728-221-1 is published monthly by the Association for Talent Development, 1640 King Street, Alexandria, VA 22314. TD at Work is available for subscription in print or digitally. The subscription rate for 12 issues is $99 (for ATD national members) and $139 (for nonmembers). Periodicals postage paid at Alexandria, Virginia, and additional entries. POSTMASTER: Send address changes to TD at Work, 1640 King St., Alexandria, VA 22313-1443. Claims for replacement of subscription issues not received must be made within three months of the issue date. Copyright © January 2015 TD at Work and ATD. All rights reserved. No part of this work covered by the copyright hereon may be reproduced or used in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or information storage and retrieval systems—without the express written permission of the publisher. For permission requests, please go to www.copyright.com, or contact Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923 (telephone: 978.790.8500, fax: 978.646.8600). ATD Press grants permission for the material on page 16 to be reproduced for personal use.
It’s in your pocket. It’s in your bag. It’s even snuggled up next to you while you sleep. You know what we’re talking about—mobile devices. Mobile devices have become an important part of our daily lives and, because of our familiarity with the technology, present a terrific opportunity to enhance learning and performance in the workplace. We often use mobile devices to search for information, communicate, and seek performance support. But how do we use our devices for mobile learning? Actually, what is mobile learning? 

The first challenge when considering the use of mobile learning (m-learning) is defining what mobile learning is. The second challenge is identifying the movement, adoption, and implementation of mobile learning as a learning strategy. It’s no surprise that mobile devices, which were primarily built for information sharing, communication, and entertainment, are a rapidly changing technology. The mobile learning space, however, has progressed at a much slower pace.

In this TD at Work, we will first focus on formal instruction and the three learning theories: behaviorism, cognitivism, and constructivism, and the techniques that are known to promote learning. We will then examine three informal learning categories: information, performance support or decision support, and social or expert learning. While these may be tangentially influenced by learning and development (L&D) organizations, these types of informal learning are important because learners have come to rely on them and they are becoming integrated into work and personal life. The more you know about these informal learning sources, the better equipped you will be to influence the design of mobile learning applications or blend them with formal instruction.

WHAT IS MOBILE LEARNING?

Earlier definitions of mobile learning focused on the technology (the provision of training on PDAs, smartphones, mobile devices). Later, the definition of mobile learning evolved to focus on mobility (any learning that happens when the learner is not in a fixed place), then learning (the acquisition of knowledge and skills through mobile devices), and most recently, a focus on performance put forth by The eLearning Guild (any activity that allows individuals to be more productive when consuming, interacting, or creating information mediated by a mobile device). 

As we can see, there are a variety of ways to define mobile learning. In fact, Australian researchers are now trying to determine a dynamic definition of mobile learning.

Whether we can define it consistently, whether we can afford it, or whether we can support it—the bottom line is that mobile learning is not going away. We should at least figure out a way to design for it. Porting e-learning, designed for a specific platform that has specific affordances, over to a mobile device does not make m-learning. It makes headaches.

In a comparison of mobile learning drivers and barriers from a 2007 study by The eLearning Guild to a 2014 study by Toward Maturity, we notice that the reasons we wanted to implement mobile learning in 2007 (the drivers) are similar to the reasons we want to implement it in 2014. We also note that the barriers, although in slightly different priority, also remain relatively similar. Our ability to address these barriers has not progressed much in seven years.

FOCUS ON LEARNING

When looking at mobile learning opportunities, instruction can be categorized as formal instruction or informal learning, and participants can learn using both. As educators, we are often focused on formal instruction but we should not ignore the opportunities offered by informal learning applications such as performance support and decision support,
expertise location, and information applications. The figure on page 3, Formal Instruction and Informal Learning, depicts the dichotomy of formal instruction and informal learning.

Let’s start by focusing on formal instruction and the techniques that are known to promote learning. We will first look at two learning cycle models that provide the bigger picture in which formal teaching strategies are used.

The first two learning theories, behaviorism and cognitivism, use a four-phase model to describe the learning cycle. The first phase is presenting information. In this phase, information is chunked, sequenced, and (in the case of mobile learning) formatted for use with mobile devices. The second phase is guided practice, which enables the learner to rehearse new skills or knowledge with cues, hints, and other scaffolding support. The third phase requires the learner to practice independently and gain mastery of the skills and knowledge. The last phase is assessing the student’s learning. In this phase, skills and knowledge are tested to determine if mastery has been achieved. If mastery is achieved, the next module is presented and the cycle repeats. If not, remediation is offered. What is important about understanding the four-phase model is that without feedback during guided practice, independent practice, or evaluation, it is not instruction. There are a lot of programs that present information and use a quiz as evaluation—these are not instruction.

The third instructional theory, constructivism, follows a slightly different model. Rodger W. Bybee’s five Es—Engagement, Exploration, Explanation, Elaboration, and Evaluation—are an example of a constructivist learning cycle. In this model the instructor engages the learners by piquing their interest, challenges them to explore a topic on their own, and allows them to explain their ideas. Then the learners elaborate on their ideas by making connections to other theories or applying their ideas to a new situation. Diagnostic evaluation takes place in all four phases, and both learners and instructors are involved in gauging the understanding of concepts and development of skills.

As training professionals, it is essential to understand the three learning theories if you want to deliver solutions that build the skills and knowledge needed by your learners. Mobile devices are still a relatively new delivery medium for learning and they are continually adding functionalities. There is great risk of using the

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<td>1</td>
<td>Increase learner or user access and availability</td>
<td>Increase learning access and flexibility</td>
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<td>2</td>
<td>Accommodate learner or user needs</td>
<td>Increase on-the-job productivity</td>
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<td>3</td>
<td>Increase speed of content delivery</td>
<td>Support organizational change and provide a faster response to changing business conditions</td>
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<tr>
<td>4</td>
<td>Improve learner or user performance</td>
<td>Increase the reach of learning solutions</td>
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<td>5</td>
<td>Reduce costs</td>
<td>Increase the ongoing sharing of good practice</td>
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<tr>
<td>1</td>
<td>The content developed for other media does not transfer well to mobile</td>
<td>The cost of development, set-up and maintenance</td>
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<td>2</td>
<td>Lack of standards</td>
<td>IT security issues</td>
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<tr>
<td>3</td>
<td>Lack of security (vulnerable transmission)</td>
<td>Unreliable ICT infrastructure</td>
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<tr>
<td>4</td>
<td>The screen is too small (affordances)</td>
<td>The wide variation in learners personal technologies</td>
</tr>
<tr>
<td>5</td>
<td>Limited bandwidth (infrastructure)</td>
<td>It is too complex to support</td>
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affordances of mobile devices because they are available, or because a client is focused on some novel functionality. Exploring these learning theories will give you thoughtful strategies, tactics, and techniques grounded in learning research, which will help you move forward with your instruction. Because mobile learning is new and the devices are rapidly changing, there is scant research on learning theory tested on mobile devices, but the learning theory presented here is well researched and relevant regardless of the medium.

### INSTRUCTION AND MOBILE DELIVERY

How do learning theories contribute to the design of m-learning? After the learning goals and objectives are identified, these theories help guide our design decisions. A learning theory describes how learning takes place. Based on how we believe learning takes place, we select our instructional theories, which prescribe how to better help people learn. With a theoretical basis in place, we then proceed to select the appropriate instructional strategies that will help people learn.

Another way of looking at the differences among the learning theories is one devised by Peggy Ertmer and Timothy Newby in which they plot the three theories along two axes, with the Y-axis plotting task knowledge and the X-axis plotting the level of cognitive processing required by the task. Task knowledge refers to how the learner views the difficulty of the content to be learned. Task knowledge is considered to be high if learners think the assignment is difficult, long, or that they will need a great deal of mental or tangible resources to complete the assignment. Cognitive processing also ranges from low to high, and refers to internal mental activities such as perceiving, paying attention, interpreting, understanding, and remembering.

This figure is helpful when trying to decide which learning theory is best suited for your training needs. What is the learner's perception of the difficulty of the task? How much cognitive processing is required? For example, teaching sales associates to describe the features of a new running shoe requires low task knowledge, low cognitive processing, and could be taught well using behavioral instructional strategies. On the other hand, teaching managers to lead...