OBTC 2015 at University of La Verne
June 17th – 20th, 2015

Submission Template

SUBMISSION GUIDANCE

1) Title of Proposal:

Enhancing Our Teaching by Drawing on Recent Developments in the Science of Learning

2) Abstract:

Please include a brief session description (not to exceed 100 words).If your proposal is accepted, this description will be printed in the conference program.

If we wish to learn in community, we need to be aware of key findings in the science of learning. This session begins with an assessment of current thinking and provides exposure to recent research on the science of learning, with a focus on popular beliefs that are often wrong. We model an effective process that is consistent with learning principles by providing a brief assessment to participants, addressing key principles, and including supporting resources. Research is highlighted on these key topics: self-assessment of learning, learning in teams, problem based learning, deliberate practice, rereading, retrieval, massed practice, and interleaved practice.

3) Keywords:

Use three or four keywords to describe your session.
Learning Science, Teaching, Meta-learning

4) Format
   ___ Activity or exercise
   ___ Discussion roundtable (60 minute only)
   _X_ General discussion session

5) Time Requested:
   _X_ 30 Minutes
   ___ 60 Minutes (*Roundtables must select 60 minutes*)
   ___ 90 Minutes

6) Planning Details:
Does your session have any special requirements for space or materials?

We have no special requirements or needs.

7) Learning Objectives or Goals for the Session:
What are 2-4 specific learning outcomes that participants will get from your session?

In our 30 minute session a participant will:
1. Discover counterintuitive findings from the science of learning that are relevant to our teaching.
2. Review and receive resources that will continue to enhance the session discussion well after our time together.

8) Management or Teaching Topics:

Describe what management and/or teaching topics are relevant to your session, and why. Please include theoretical, disciplinary, or theoretical foundations that will help reviewers understand how your ideas fit within the broader field of management.

This session is designed to enhance teaching and learning practices rather than to teach a particular concept or set of concepts. Thus, this session can be applied to any construct in management. A brief review of the concepts of meta-learning and the science of learning will be introduced and discussed.

This session is motivated by our observation that recent developments in the science of learning are relevant to how to learn whether we are teaching or assisting students. However, our awareness of such developments may be lacking or at least uneven. Thus, we have developed an engaging session that begins by provoking thinking about our current knowledge, and then briefly provides an overview of a few key findings that may be relevant to participants. In particular, we focus on areas in which the findings are often counter-intuitive to most people (Carey, 2014).

Interesting that Medina, a consultant to neuroscience researchers, concludes that the current practice of learning in schools appears to be almost perfectly mismatched with what we have learned is most helpful to the brain in learning (Medina, 2014)

Sensitive to the fact that few of us have time to immerse ourselves in the immense and varied set of literatures that feed into the science of learning, we identify and draw particularly from a few accessible sources that summarize some of these key findings and how they can be relevant to our work:

- *Make it Stick: The Science of Successful Learning* (Brown, Roediger, & McDaniel, 2014)
- *How We Learn: The Surprising Truth about When, Where, and Why It Happens* (Carey, 2014)
- *Brain Rules: 12 Principles for Surviving and Thriving at Work, Home and School* (Medina, 2008)

As clarification, we will be operating on the definition of learning provided by Brown, Roediger and McDaniel (2014. p. 2) – "acquiring knowledge and skills and having them readily available from memory so you can makes sense of future problems and opportunities."

9) Session Description and Plan:

What will you actually do in this session? What activities will you facilitate, how long will they take, and how will participants be involved? Reviewers will be evaluating how well the time request matches the activities you'd like to do, and the extent you can reasonably accomplish the session's goals. Reviewers will also be looking for how you are engaging the participants in the session. Include a timeline for your session.

In our session we will engage our participants by administrating a short quiz and highlighting and discussing key findings from the science of learning.

- Provide an assessment that provokes interest in the topic
    - (Quiz – 7 min.)
- Briefly highlight key findings from the learning sciences
    - (Highlights and Discussion – 17 min.)
- Discuss implications and provide resources for further investigation
    - (Distribute and discuss resources – 6 min.)

10) For Activities and Exercises:

Attach any materials needed to run the activity and debriefing questions. Evidence for effectiveness may also be included.

Part One

QUIZ/ASSESSMENT (Answer True or False, and share your reasoning

(Sample included with key findings in brackets. Bracketing will be removed. The quiz replicates a learning science concept that will be highlighted.)

1. Generally, people have a reasonably good intuition about how they learn best. [Self-Assessment of Learning]
2. People tend to learn best when they are first instructed in relevant material and then presented with an opportunity to apply what they have learned (presenting them with a problem to address prior to providing the educational resources that are relevant to dealing with that problem). [Problem based learning]
3. People have a natural ability to choose effective strategies for learning in teams [Ability to design their own learning in teams]
4. Becoming a top performer typically requires having some innate capability that sets one apart from others versus that truly exceptional performance is largely a function of practice. [Deliberate practice]
5. Rereading text is beneficial to the learning process. [Rereading text]
6. Frequent testing can be a distraction from learning.   [Retrieval]
7. Highlighting and re-reading text is helpful to learning. [Massed practice]

HIGHLIGHT ELEMENTS OF THE FOLLOWING KEY FINDING THAT ADDRESS THE ITEMS IN THE QUIZ ABOVE.

Quality of self-assessment of learning

People tend to make the mistake of assuming that activities that "feel" productive in learning actually "are" productive for learning. This tends to lead people to choose and persist in activities that have proven to be ineffective. For example, surveys show that as high as 80 percent of students favor some of the learning strategies that are least effective (Karpicke, Butler, & Roediger, 2010). As one example, rereading text feels efficacious and reassuring to students but research suggest adds little value to learning. Cramming is another practice that is common among students but also is ineffective for real learning.

Even when students are provided with opportunities to personally test out and compare different learning activities and the evidence is presented to them, they tend to reject the empirical evidence and persist in using methods that are not productive, even though it is based on their own personal experience (Brown, Roediger & McDaniel, 2014).

Problem Based Learning

The traditional method of teaching commonly involves beginning by exposing students to new material (often through lecture) and then having them apply what they have learned. By contrast, research funded by the National Science Foundation investigated how people learn best, and discovered that students learn better if they are exposed to a problem or case and asked to give their initial thoughts on how the situation might be addressed. After doing some initial thinking students are then exposed to new material. This may seem counter intuitive, but this process appears to engage students and ready the brain better to absorb new material. (Bransford, Brown & Cocking, 2000). The challenge cycle is illustrated below.

Learning in Teams

Although there is much to know about maximizing the effectiveness of learning in teams (Edmondson,), we choose to focus on what J. Richard Hackman has noted is one crucial but commonly neglected element–structure (Hackman, 2011; Hackmann & Wageman, 2005). Hackman notes that those who organize teams and teams themselves typically pay too little attention to how the team roles and responsibilities and that initial launch of the team should be structured (Hackman, 2002). This is detrimental to team learning and performance.

One interesting finding from the research on student learning published in *Academically Adrift* (2011) is that students who worked in groups demonstrated less learning across their college experience than students who did not (Arum & Roksa, 2011). Although there may be a number of reasons for this, of particular importance is that most students do not intuitively understand how to structure and operate a team of peers for effective learning. Thus, the potential benefit of working in a team often fails to materialize.

Deliberate Practice

Researchers note that excellent performers implement effective forms of Deliberate Practice (Colvin, 2012; Coyle 2009). Unfortunately, the most common forms of practice that people use do not closely resemble the conditions of Deliberate Practice (Shadrick & Lussier, 2009). In addition, the conditions present in most organizations discourage rather than support Deliberate Practice. General characteristics of Deliberate Practice include (Ericsson, 2009):

- Highly structured activity
- The explicit goal is to improve performance
- Tasks are invented to overcome weaknesses
- Performance is carefully monitored to find ways to improve it
- Requires intense effort and is not inherently enjoyable

Professional development and the development of expertise are typically characterized by a curve that looks something like Figure 1. In other words, learners are on a steep learning curve initially, and then their development tends to plateau.
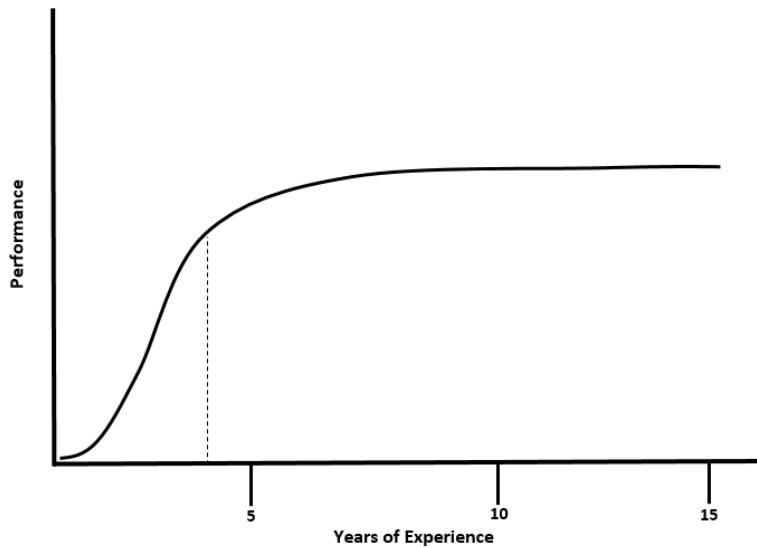
Figure 1.

Individuals, educators, and others can help professionals better understand what Deliberate Practice is and what they might do differently to enable these professionals to continue their development.

Massed Practice

Massed practice (for example, cramming) has been demonstrated to be ineffective for long-term learning. Students retain much more when they spread learning activities across time (Agarwal, Bain, & Chamberlain, 2012). Despite the limitations of its effectiveness, students tend to perceive it to be effective and to use it regularly.

Retrieval

One of the most important findings from the learning sciences is that practicing retrieval is essential effective learning (Carey, 2014). A dilemma with respect to this issue involves the way that society feels about testing. The problem is that too much emphasis has been placed on testing as an assessment or learning, but little is understood by the broader public about the value of testing in formative processes. Even very informal and self-administered quizzes slow the forgetting process and result in significantly better retention.

Thus, people tend not to design their self-organized learning experiences in ways that involve enough retrieval for the explicit purpose of learning (versus merely for the purpose of achieving an outcome on a test) (Argarwal, Bain, & Chamberlain, 2012).

11) Implications for Teaching or for Teachers:

What is the contribution of your session?

These findings are relevant to us in a number of ways:
- For the benefit of our own learning
- In designing courses
- In selection of teaching strategies
- Educating students to be better managers of their own learning
- Educating students as to why we select the methods we use and how that is likely to impact their learning
- Assisting trainers and human resource professionals to be more effective in facilitating the learning of others.

12) Application to Conference theme:

How does your session fit with the overall OBTC theme of Learning in Community?

As our abstract states, if we are to truly learn in community, do we not need to understand the science of learning or the ability to learn? We believe as educators in learning communities we must be curious and willing to enhance our teaching so as to enable our students to learn; thus, gaining knowledge that will be useful, beneficial, and provocative to everyone involved – teacher and learner.

13) Unique Contribution to OBTC:

Have you presented the work in this proposal before? If so, how will it be different? Is this proposal under current review somewhere else? If so, please explain. How will your proposal be different for the OBTC conference?

This session is designed solely for this conference with its emphasis on teaching and learning.

14) References and/or Additional Materials:

Agarwal, P. K., Bain, P. M., & Chamberlain, R. W. (2012). The value of applied research: Retrieval practice improves classroom learning and recommendations from a teacher, a principal, and a scientist. *Educational Psychology Review*, (24), 437–448.

Brown, P. C., Roediger, H. L., & McDaniel, M. A. (2014). *Make it stick: The science of successful learning*. Cambridge, Massachusetts: The Belknap Press of Harvard University Press.

Carey, B. (2014). *How we learn: The surprising truth about when, where, and why it happens*. New York: Random House.

Colvin, G. (2010). *Talent is overrated: what really separates world-class performers from*

everybody else. New York: Portfolio.

Coyle, D. (2009). *The talent code: greatness isn't born. It's grown. Here's how*. New York: Bantam Books.

Bransford, J. D.; Brown, A. L.; Cocking, R. R. Eds (2000). *How people learn: Brain, mind, experience, and school.* Washington, DC: National Academy Press.

Edmondson, A. C. (2012). *Teaming: How organizations learn, innovate, and compete in the knowledge economy* (1st ed.). San Francisco: Jossey-Bass.

Ericsson, K.A. (2009) *Development of professional expertise: toward measurement of expert performance and design of optimal learning environments*. New York: Cambridge University Press.

Hackman, J. R. (2002). *Leading teams: Setting the stage for great performances*. Boston, Mass: Harvard Business School Press.

Hackman, J. R. (2011). *Collaborative intelligence: Using teams to solve hard problems*. San Francisco, CA: Berrett-Koehler Publishers.

Hackman, J. R., & Wageman, R. (2005). A theory of team coaching. *Academy of Management Review*, *30*(2), 269–287. doi:10.5465/AMR.2005.16387885

Karpicke, J. D., Butler, A. C., & Roediger, H. L. (2010). Metacognitive strategies in student learning: Do students practice retrieval when they study on their own? *Memory*, (17), 471–479.

Medina, J. (2014). *Brain rules: 12 principles for surviving and thriving at work, home, and school* (2nd ed.). Seattle: Pear Press.

Shadrick, S. B. & Lussier, J. (2009). Training complex cognitive skills: A theme-based approach to the development of battlefield skills. *Development of Professional Expertise: Toward Measurement of Expert Performance and Design of Optimal Learning Enviornments*, 286–311. Cambridge University Press.