Thinking Innovatively about Teaching Innovation And Ideation: Getting Students to Think Differently

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Abstract
This paper describes a template for innovation/ideation exercises that integrates thinking from the entrepreneurial cognition literature with practical course design elements to systematically develop individuals' ideation capabilities. The proposed approach is appropriate for individuals teaching or facilitating in contexts aiming for breakthrough ideation in business, healthcare, computer-science, and public-administration products and services. The approach is driven by a need within industry and academe for curricula that develop and promote understanding of innovation processes, particularly regarding an entrepreneurial mindset. Included are an industry review and academic perspectives; proposed innovation phases and associated rationales; pre and posttest beliefs, efficacy, and ideation outputs used for initial assessment; and brief discussion on the challenges and value-add of the proposed innovation.

Key Words
Innovation, ideation, teaching, entrepreneurial cognition

Introduction

Innovation in the workplace has been a critical competency able to generate a competitive advantage for many decades (Tidd, Bessant, & Pavitt, 2005; Barsh, Capozzi, & Davidson, 2008). As a result, understanding and promoting innovation processes has been identified by business and educational leaders as an imperative likely to impact the future of organizations (AACSB, 2010; The Chronicle of Higher Education, 2013). However, organizations have been cautioned as to limitations associated with incomplete views of innovation linked to current thinking in innovation and education (Tidd, Bessant, & Pavitt, 2005; Lorange, 2010). Thus, our understanding of how to train or teach others to innovate remains nascent with regard to effective teaching models and curricula. As educators train the workforce of tomorrow, it is crucial that we understand the situational processes that can engender the creation of innovative ideas to solve complex workplace issues (Davis, 2000; Isaksen, Aerts, & Isaksen, 2009).

Individual innovativeness has traditionally been viewed as a trait, rather than a learnable competency, which is likely due to the lack of effective training on innovation skills. As a result, only individuals with natural predispositions to think creatively or take risks, such as the Steve Jobses of the world, have been sought after for this valuable ability. Yet, recent evidence supports the contention that creativity in the context of business innovation is predominantly a learned behavior (Dyer, Gregersen, & Christensen, 2009). Furthermore, our workplaces and educational institutions have inhibited the creation of innovations through rigid rules that penalize failure and cultures that reward the status quo. Thus, while the market demands innovation, most current organizational structures and methods of operation are designed to squelch it, albeit unintentionally.

Consistent with the work of Dyer, et al. (2009), we maintain that innovativeness is a skill that can be taught, but it does take a substantial amount of rethinking the educational experience. Thus our thinking is consistent with the work of Sarasvarthy (2001), who noted successful entrepreneurs often exhibit effectual reasoning; that is, using means to imagine possible new ends. This approach is in sharp contrast to causal reasoning, selecting among means to achieve a pre-determined goal, which is typically taught as part of traditional business curricula. Therefore, the purpose of this study is to examine the course and curricula design elements that create an environment where unique and valuable innovations can emerge. This research addresses how courses can help students develop their ideation capabilities, the ability to generate new ideas. Such capabilities allow students to better understand and contribute to innovation initiatives in their future professional careers.

To accomplish this purpose, we first review the largest problem associated with innovation, namely, coming up with a good idea. Second, we integrate literature on entrepreneurial cognition with practical course design elements to show how the training environment can be designed to systematically develop students' ideation capabilities. We then empirically examine students' innovation competencies with a pretest-posttest design, and discuss the results. Finally, the value-added, challenges, and adaptability of this instruction method for teaching innovation is discussed in the concluding remarks.

The Importance of the Innovation Process to Curriculum Objectives

Understanding and promoting innovation processes has been identified by the Association to Advance Collegiate Schools of Business, or AACSB (2010,as an imperative likely to impact the future of business, and business education. Indeed, organizations have been cautioned as to limitations associated with incomplete views of innovation tied to extant linear models, due to the costs and risks associated with innovation (Tidd, Bessant, & Pavitt, 2005). Similarly, business education has been criticized for teaching within "silos" that overemphasize linear thinking (Lorange, 2010).

One movement that holds the potential to help address this problem is the entrepreneurial revolution of the last 20 years, which has transformed both industry and academe (Kuratko, 2005). An important outcome of this entrepreneurial revolution is research on entrepreneurial cognition, which includes all facets of cognition that are relevant to entrepreneurial processes, such as opportunity recognition, decision making, and complex problem solving in the context of venture creation (e.g., Baron & Ward, 2004; Krueger, 2004; Mitchell et al., 2002).

One area of the entrepreneurial cognition literature that is pertinent to the current study is research on the entrepreneurial perspective or mindset that can be developed by individuals and applied in various contexts (Kuratko, 2005; Krueger, 2007). At the core of the entrepreneurial mindset resides opportunity recognition, which is an orientation toward identifying and acting on options for venture creation. Conceiving more potential opportunities increases the likelihood of finding the best ones to develop. Thus, the entrepreneurship literature addresses relevant issues as to the "cognitive infrastructure" that would enable the identification of new opportunities by individuals (Krueger, 2000).

Similarly, the innovation process is analogous to a funnel with the wide mouth representing early idea generation which should be widened to include a greater quantity of ideas (Terwiesch & Ulrich, 2009). The funnel gradually tapers as ideas are eliminated through feasibility analysis and product development to identify the ideas with the greatest potential, until final

commercialization, where the funnel ends. In addition to maximizing the quantity of ideas, evidence also suggests practices that can break the cognitive inertia often associated with ideation (Reinig & Briggs, 2008) and that increase the variability in ideas strengthens the overall quality of ideas (Terwiesch & Ulrich, 2009).

There is emerging agreement that critical experiences involving deliberate practices that change deep beliefs facilitate the development of an entrepreneurial mindset (Krueger, 2007). In this conception, learning moves beyond mere facts to metacognitive capabilities related to awareness of changes in cognitions, the so-called "learning how to learn." It is through such mechanisms that entrepreneurs understand how they "connect the dots" in self-directed learning. However, there is less agreement as to what should be practiced and how practices should be structured to enhance an entrepreneurial mindset (Krueger, 2007), particularly as related to experiences in the classroom. Thus, we draw inference from the entrepreneurial cognition literature to design practical course management elements, with the intention of systematically developing students' ideation capabilities.

Rationale and Outline of the Innovation Phases

The importance of developing a "cognitive infrastructure" and moving students from "novice" to "expert" scripts has been recognized as important for students to learn how to think entrepreneurially (Krueger, 2007). Metacognition is an awareness of thinking and using self-reflection to change thinking. This type of higher-order thinking has been found to be related to entrepreneurial expertise (Mitchell, 2005; Baron & Henry, 2006). Therefore, helping students develop the mental architecture for the entrepreneurial mindset is of critical importance to developing the skills of innovative thinking.

Critical thinking (or thinking about thinking) appears in many reviews of skills required of business school graduates (Celuch & Slama, 1998). Indeed, examples of the integration of critical thinking pedagogy into education can be found that span the use of specific tools and techniques to curriculum revision (cf. Celuch & Slama, 2000; Wee, Kek, & Kelley, 2003; Roy & Macchiette, 2005; Klebba & Hamilton, 2007; Aitken & Deaker, 2007). However, there is a dearth of understanding in the extant business educational literature on the application of critical thinking pedagogy to the development of an innovative entrepreneurial mindset. As such, appropriately adapted innovation and ideation exercises are primary mechanisms through which metacognitive abilities can be developed and refined.

To initiate the development of metacognition in the educational context, two class periods (approximately 3 hours) are spent introducing critical thinking and its importance to students. The approach sensitizes students to the elements of critical thinking, which can include purpose of the thinking, key question or problem being considered, assumptions, points of view, information/evidence, concepts, implications/consequences, and inferences or interpretations/conclusions and how awareness of the system can be used to add depth and breadth to one's thinking (Celuch, Kozlenkova, & Black, 2010). Students are then required to relate various critical thinking elements to their own experience and then journal about their understanding of the process in this context. As this phase introduces students to the concept of critical thinking and engages them in the process through elaboration and self-reflection and serves as the scaffolding for later idea generation, it is referred to as the *background phase*. Two examples of the critical thinking elements are presented below.

1. Students are encouraged to think of an assumption (or "given") associated with a product or service. They must then remove or reverse the assumption and think of what this might mean for future product/service possibilities. For example, an assumption associated with

restaurants is that they serve food. What if a restaurant did not serve food? Students are instructed to journal a reflection on the new service's value proposition.

2. Students are to go a bookstore and scan magazines that they would normally not choose to read (or, alternatively, engage in an activity they have not done before). They are then instructed to journal a reflection on their "typical" point of view and how they might broaden their point of view from the new sources of information (or new experience).

Following the background phase, the process then focuses on the development of an entrepreneurial mindset and is referred to as the *entrepreneurial engagement phase*. This phase involves using key critical thinking elements in immersion activities that provide further opportunities for deliberate practice with entrepreneurial and innovation cognitions. Immersion activities are assignments that engage students in active learning by structuring the course objectives around experiential tasks. The benefits of experiential learning have long been recognized (Kolb, 1984; Cantor, 1997). Experiential-active learning has been found to crystallize understanding and promote higher-level learning much more effectively than such passive forms of learning as lectures or reading a text. Furthermore, the subject of entrepreneurship and innovation is more effectively learned through hands-on experiences as students engage in solving problems and creating products instead of memorizing specialized content. This type of learning contrasts sharply with more conventional passive learning (Wagner, 2012). Thus, immersion in innovation activities is the ideal course design for maximizing learning outcomes.

Following are three assignments that demonstrate types of experiential activities that can be used to elaborate and reinforce learning from the background phase to show how the approach can be adapted to "real world" client assignments.

1. Working with an existing patent, students are asked to employ assumption reversals to broaden their ideation potential. In this exercise, beliefs that may never surface and/or be questioned are made explicit, reversed, and then used as departure points for potentially new ideas. For example, one assumption might be that the complete patent must be used in the development of a new idea. Reversing or removing the assumption would involve using only a part of the patent and then developing potential ideas from only one aspect of the patent. The ideation process can now continue with alternative aspects of the patent.

2. Again, working with an existing patent, students are asked to ideate based on randomly generated concepts, visuals, and/or video sequences as a means of expanding their point of view. The concepts (visuals and/or videos) are displayed on cards (or presentation software) that are shuffled (or arrayed randomly) and then drawn (or presented) as a means of introducing randomness to the process. Students are given 3 or 4 minutes to write down as many ideas as possible on large sheets of newsprint. The process is then repeated multiple times. Students are then asked to connect and develop new ideas from the multiple iterations of associations.

3. In the interest of extending points of view, students are randomly provided with two mega-trends (e.g., aging boomers, sustainability concerns, rising healthcare costs, etc.), the intersection of which serves as the basis for idea development. Another mega-trend is randomly added to expand the thinking as ideas must now broaden to incorporate the added trend.

Note that the use of multi-sensory stimulation is in keeping with the work of Mayer (1997). This research identified a clear "multi-media effect" in which participants exposed to coordinated visual and verbal stimuli generated a median of over 50% more creative solutions on problem-solving transfer tests than participants exposed to only one modality. This effect was observed across multiple studies and in one case resulted in over 75% more creative solutions generated (Mayer, 1997). Thus the positive outcomes associated with this supra-additive integration of stimuli appear greater than the sum of the parts (Medina, 2008).

After engaging in these types of assignments, students are instructed to journal reflections on their positive and negative experiences with the process. That is, what was confusing, freeing, frustrating, fun, time wasting, insightful, etc., regarding their involvement in the ideation exercise. Exercises like the ones described earlier are used over the entire course of a semester. While the background phase assignments and journaling are completed individually, the majority of entrepreneurial engagement assignments are completed in small groups during class. Thus, students experience much less lecture than the typical class and instead experience a more continuous process of ideation and connecting associations in groups, and reflecting individually on their thinking in groups.

With regard to the role of the professors, whom we refer to as coaches, we typically circulate around the room while students are engaged in ideation, and, through monitoring the process, develop a much better feel for student thinking that allows us to be better "real time" coaches. In addition, we randomly collect a sample of student journals at various points during the semester and provide feedback on reflections emphasizing that the students should strive for depth rather than merely "reporting" on activities. Reflection on one's experiences is vital for the elaboration process, as it facilitates the organization and crystallization of understanding into cognitive categories related to experiential or active learning.

The coaching-and-feedback model is an ideal fit for teaching innovation, as it seeks to help students understand their own personal talents and thought processes, rather than imparting previously structured learning from a textbook to students, as one would find in a more conventional, lecture-style course. Furthermore, if we desire students to create something new, leaning on experience or research limits thinking, as it causes the mind to replicate rather than create. In contrast, focusing on the innovation process itself forces students to find their own unique solutions to problems. The result for students is a more complete understanding of the innovation process, and a more holistic understanding of themselves.

In summary, the intent of these innovation phases is to provide a "nutrient rich" environment for growing an entrepreneurial perspective with particular respect to ideation. This approach marries the entrepreneurial cognition literature with consistent practice that makes explicit the point of the thinking, as it also provides for reflective elaboration of experimental ideation. To analyze the impact of this approach on student learning, the next section describes our assessment process and measurement of learning outcomes.

Assessment

Participating in this assessment were 24 and 22 students enrolled in the spring and fall sections of the upper division innovation/ideation class. Individuals in the classes experienced the pedagogy described above. The assessments utilized a pretest (administered at the beginning of the semester)-posttest (administered at the end of the semester) design.

The questionnaire contained multiple items associated with an ideation-evaluation measure assessed via 10-item scales (Basadur, 2002) as well as an ideation self-efficacy measure assessed via 7-item scales adapted from Celuch et al. (2010) (Cronbach's alpha .83 and .81 for the spring and fall classes). Justification for use of the ideation measure relates to the prominence of deep beliefs as the foundation of entrepreneurial attitudes and intentions (Krueger, 2007). Thus the Basadur measure consisted of discrete beliefs related to ideation. Self-efficacy was measured due to the central role of efficacy perceptions in the development of a self-identity and related behavior associated with innovation and critical thinking (Krueger, 2007; Celuch et al., 2010). The same measures were used for the spring and fall classes. It was expected that consistent practice and experience with the approach outlined earlier would significantly enhance specific ideation-related beliefs, ideation self-efficacy, and the uniqueness of ideation output.

Results

Tables 1 and 2 present pretest and posttest means and *p*-values for the paired sample *t*-tests for the measures for the spring and fall classes. Note that, as expected, posttest means were consistently significantly higher (or lower, depending on item wording) for a shift in beliefs away from self-censoring and prejudging during ideation and more towards greater openness in the ideation process.

Table 1. *Means and* p*-values for Pre and Posttest Ideation Beliefs for Spring Semester*

	Group Means		
Item	**Pretest**	**Posttest**	***p*-value**
I should do some pre-judgment of my ideas before telling them to others.	7.00	5.95	.006
One new idea is worth ten old ones.	4.62	5.86	.066
Quality is a lot more important than quantity in generating ideas.	6.95	3.95	.000
I think everyone should say whatever pops into their head whenever possible.	3.90	4.95	.002
I wish people would think about whether or not an idea is practical before they open their mouths.	5.14	3.67	.001

Further, perceptions relating to ideation self-efficacy were also significantly strengthened. Beyond quantitative assessments, a key question related to the level of uniqueness of the student-developed ideas. In terms of ideation output for the spring semester, eight groups of students engaged in the earlier-outlined exercises and generated many possible alternatives to already existing idea patents. Each group then selected its final idea to be pitched to a client interested in

technology development and transfer. The client had already brainstormed possible commercialization avenues for the patents that served as a baseline for comparison.

Table 2. *Means and* p-*values for Pre and Posttest Ideation Beliefs for Fall Semester*

Item	Group Means		
	Pretest	**Posttest**	***p*-value**
I should do some pre-judgment of my ideas before telling them to others.	7.27	5.82	.002
One new idea is worth ten old ones.	6.59	7.50	.038
Quality is a lot more important than quantity in generating ideas.	7.64	6.56	.035
I think everyone should say whatever pops into their head whenever possible.	4.49	5.32	.100
I wish people would think about whether or not an idea is practical before they open their mouths.	4.68	3.73	.050

Table 3. *Means and* p-*value for Pre and Posttest Ideation Self-Efficacy for Spring Semester*

Item	Group Means		
	Pretest	**Posttest**	***p*-value**
Ideation self-efficacy	5.07	5.96	.002

Of note is the finding that none of the eight student-developed ideas were represented in already-existing client brainstorming lists, which contained more than 30 product ideas. So in terms of idea uniqueness, the present approach exceeded conventional brainstorming techniques in that none of the student ideas overlapped ideas already generated by the client. Similar results were observed for the fall semester ideation output, which was compared to benchmark ideation from the client.

Table 4. *Means and* p*-value for Pre and Posttest Ideation Self-Efficacy for Fall Semester*

Item	Group Means		
	Pretest	**Posttest**	***p*-value**
Ideation self-efficacy	5.63	6.04	.004

Discussion

The proposed innovation phases are designed to address industry and academic imperatives to understand the innovation process and develop an evidence-based approach for teaching innovation skills. This method transcends tools and techniques, as it is oriented toward metacognitive thinking and the development of an entrepreneurial mindset that can extend lifelong learning. As a result, the entrepreneurial mindset that is generated is not limited to the classroom, as it would be useful to individuals working in various organizational contexts. Initial assessment results relating to changes in ideation beliefs and efficacy, as well as idea uniqueness, suggest that the approach holds the potential to positively impact aspects of an entrepreneurial mindset and with further refinement and empirical support could contribute to evolving entrepreneurial cognition and innovation literature.

Challenges and Adaptability of the Innovation

As with any new approach, implementation issues can always be identified. For the proposed innovation, students often struggle with randomly driven ideation. We are so conditioned to linear thinking that it is often difficult for individuals to get started and tolerate initial confusion, as they cannot see the "end game" when participating in such exercises. The aforementioned design elements help address this issue. First, we believe orienting the ideation within a broader critical-thinking system is important, as it provides students with a metacognitive "anchor" from which to increase their tolerance for ambiguity. It does this by showing how the critical thinking elements can be used to enhance generative (creative) capacity and how they can then be used in the more "traditional" way to enhance evaluative capacity during future feasibility analysis related to ideas. This is accomplished during the entrepreneurial engagement phase described above. We also employ deliberate coaching and encouragement during these exercises.

A primary strength of this teaching method is that although we employ the approach as part of an innovation/ideation class, the exercises can be used in virtually any course or training environment that requires ideation, such as product/service development or improvements. The approach has also been applied in 5-week formats as well as for employees within an organization and for individuals in the nonprofit sector (from different organizations) taking the same workshop. This approach is particularly advantageous for the corporate environment; the greatest return on innovation efforts can be captured by improving idea generation, as this stage is relatively inexpensive compared to subsequent product-development stages.

In closing, industry and academe highlight the need for curricula that develop and promote understanding of innovation processes. The uniqueness of the proposed innovation phases relates to the extent to which critical thinking and reflection serve as "cornerstone" and "capstone" aspects of the ideation process. Although many classes and companies use some form of brainstorming, ideation is one of the least-well-understood aspects of innovation. Not surprisingly, there is a dearth of research which explicitly delineates the process by connecting it to extant entrepreneurial cognition literature, so that ideation is a means to contribute to students' entrepreneurial mindset. Thus, while "teaching" someone to be the next Steve Jobs is impossible, creating an environment that facilitates innovative thinking through experiential learning can dramatically help individuals understand the innovation process and develop the valuable mindset and skillset of an experimental innovator.

References

Aitken, R., & Deaker, L. (2007). Critical learning and reflective practice: An exploratory study using tape recorded journals. *Marketing Education Review*, *17*, 1–5.

Association to Advance Collegiate Schools of Business (2010). *Business schools on an innovation mission: Report of the AACSB International Task Force on Business School Innovation.* Tampa, FL: AACSB International, 1–43. Retrieved from http://www.aacsb.edu/resources/innovation/business-schools-on-an-innovation-mission.pdf

Baron R. A., & Henry, R. A. (2006). Why do some entrepreneurs achieve extraordinary success? Insights from cognitive science research on exceptional performance. Paper presented at the Babson Research Conference, Bloomington, Indiana.

Baron, R. A., & Ward, T. B. (2004). Expanding entrepreneurial cognition's toolbox: Potential contributions from the field of cognitive science. *Entrepreneurship Theory and Practice*, *28*(6), 553–574.

Barsh, J., Capozzi, M. M., & Davidson, J. (2008). Leadership and innovation. *The McKinsey Quarterly, 1*, 37–47.

Basadur, M. (2002). *Basadur ideation-evaluation preference scale.* Basadur Applied Creativity Skill-Building Workshops. www.basadur.com.

Cantor, J.A. (1997). *Experiential learning in higher education: Linking classroom and community*. Washington, DC: The George Washington University Graduate School of Education and Human Development.

Celuch, K., & Slama, M. (1998). Critical thinking as an integrative theme for teaching lifelong learning skills in marketing. *Marketing Education Review*, *8*(3), 1–12.

Celuch, K., & Slama. M. (2000). Student perceptions of a marketing course taught with the critical thinking approach. *Marketing Education Review*, 10(1), 57–64.

Celuch, K., Kozlenkova, I., & Black, G. (2010). An exploration of self-efficacy as a mediator of skill beliefs and student self identity as a critical thinker. *Marketing Education Review, 20*, 257–266.

The Chronicle of Higher Education (2013). Attitudes on innovation: How college leaders and faculty see the key issues facing higher education. *The Chronicle of Higher Education Report*, Washington, DC, 1–16.

Davis, T. (2000). Global innovation and growth survey. London, UK: PricewaterhouseCoopers.

Dyer, J. H., Gregersen, H. B., & Christensen, C. M. (2009). The innovator's DNA. *Harvard Business Review*, *87*(12), 60–67.

Isaksen, S. G., Aerts, W. S., & Isaksen, E. J. (2009, spring). Creating more innovative workplaces: Linking problem-solving style and organizational climate. A CRU Technical Report. The Creative Problem Solving Group, Inc., *17*(2), 1–24.

Klebba, J. M., & Hamilton, J. G. (2007). Structured case analysis: Developing critical thinking skills in a marketing case course. *Journal of Marketing Education*, *29*, 132–139.

Kolb, D. A. (1984). *Experiential learning as the source of learning and development*. Upper Saddle River, NJ: Prentice Hall, Inc.

Krueger, N. F. (2000). The cognitive infrastructure of opportunity emergence. *Entrepreneurship Theory and Practice, 24*(3), 5–23.

Krueger, N. F., (2004). The cognitive psychology of entrepreneurship. In R. A. Baron & T. B. Ward (Eds.), . Expanding entrepreneurial cognition's toolbox: Potential contributions from the field of cognitive science (pp. 105–140). *Entrepreneurship Theory and Practice, 28*(6),

Krueger, N. F. (2007). What lies beneath? Experiential essence of entrepreneurial thinking. *Entrepreneurship*

Theory and Practice, *31*(1), 123–138.

Kuratko, D. F. (2005). The emergence of entrepreneurship education: Development, trends, and challenges. *Entrepreneurship Theory and Practice*, 29(5), 577–597.
Lorange, P. (2010, January/February). A new model for management education. *BizEd, 9*(1), 38–41
Mayer, R. E. (1997). Multimedia learning: Are we asking the right questions? *Educational Psychology, 32*(1), 1–
19. Medina, J. B. (2008). *Brain rules: 12 principles for surviving and thriving at work, home, and school*.
Seattle: Pear
Press.
Mitchell, R. K. (2005). Tuning up the global value creation engine: The road to excellence in international entrepreneurship education. In J. A. Katz & D. Shepard (Eds.), *Advances in entrepreneurship, firm emergence and growth: Vol. 8.Cognitive approaches to entrepreneurship research* (pp.185–248). Greenwich, CT: JAI Press.
Mitchell, R. K., Smith, J. B., Morse, E. A., Seawright, K. K., Peredo, A. M., & McKenzie, B. (2002). Are entrepreneurial cognitions universal? Assessing entrepreneurial cognitions across cultures. *Entrepreneurship Theory & Practice, 26*(4), 9–32.
Reinig, B. A., & Briggs, R. O. (2008). On the relationship between idea-quantity and idea-quality during ideation. *Group Decisions and Negotiation, 17,* 403–442.
Roy, A., &. Macchiette, B. (2005). Debating the issues: A tool for augmenting critical thinking skills of marketing students. *Journal of Marketing Education*, 27, 264–276.
Sarasvarthy, S. D. (2001). What makes entrepreneurs entrepreneurial? White paper. Seattle, WA: University of Washington, 1–9.
Terwiesch, C., & Ulrich, K. T. (2009). *Innovation tournaments: Creating and selecting exceptional opportunities.* Boston: Harvard Business Press.
Tidd, J., Bessant, J., & Pavitt, K. (2005). *Managing innovation: Integrating technological, market, and organizational change*. 3rd ed. Hoboken, NJ: Wiley.
Wagner, T. (2012, April 13). Educating the next Steve Jobs. *The Wall Street Journal.* Retrieved from http://online.wsj.com/article/SB10001424052702304444604577337790086673050.html
Wee, L., Kek, M., & Kelley, C. (2003). Transforming the marketing curriculum using problem-based learning: A case study. *Journal of Marketing Education, 25*,150–162.

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