

CAN THE SMALL BUSINESS INSTITUTE'S FIELD-BASED CONSULTING ENHANCE KNOWLEDGE RETENTION AND ACQUISITION?

ABSTRACT

Numerous entities such as parents, students, legislators, and the public are criticizing higher education including business schools for costs, lack of transparency, and relevance to the real world. Several studies have found declines in student performance and the lack of improvement in critical thinking and analytical skills. The deepest question is – are pedagogical methods leading to long term retention and use by graduates? Traditional education provides explicit knowledge via lectures and textbooks. Tacit knowledge is acquired with direct experience, observation, and reflection. Research on knowledge acquisition and retention shows that several steps must be taken to move neurological impulses into long term memory. The authors argue that more teaching emphasizing tacit knowledge such as the SBI's field-based consulting should be utilized. The authors review the history of the SBI program and argue that field-based consulting has more potential to tap into long term member, be retained, and used throughout an alumni's business career. Questions for future research are included.

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INTRODUCTION

Higher education is being heavily criticized by legislators, parents, students, researchers, and interested stakeholders. Criticisms include costs, lack of transparency, accountability, lack of assurance of learning, and in some reports actual declines in student performance (Spellings (2006; Moskal, Ellis and Keon, 2008; Arum and Roksa, 2011).

The deeper question is what is being taught, is it relevant, and retained for use in a graduate's career? Finally, what pedagogical approaches have the best possibilities for long term retention? The authors argue that the SBI program is uniquely positioned to provide meaningful experiences that students will retain at a much higher rate and use in their careers.

The following explores the history of the SBI program, its benefits, knowledge acquisition, knowledge retention how the brain stores information, what is retained and

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why, what is not retained, and why the SBI program has greater potential for being retained and used through a SBI graduate's career.

THE SMALL BUSINESS INSTITUTE PROGRAM

In 1974 a small group of professors left the Decision Sciences Institute to start the Small Business Institute (SBI) Program. At its core the concept is to use real business clients as part of the learning experience. To date the concept has been used in management, marketing, strategic planning, market research, and many other marketing, and branding classes.

A number of research studies have found several benefits of the SBI program. These benefits include: problem based learning (Cook, Belliveau, and Koop, 2013), dynamic group activities with other students (Ames, 2006), a broad interdisciplinary approach (Cook et al, 2013) negotiation and networking skills (Lacho and Bradley, 2010), community development opportunities (Lacho and Bradley, 2010), not passive learning (Cook et al, 2013), exposes students to real world issues include those with ethical (Hoffman, Bechtold, Murphy, & Snyman, 2016), real world economic development (Bradley, 2003), and builds critical thinking and initiative (Boyles and Lang, 2009). The latter documented client interaction and critical thinking skills in three separate methods of teaching strategic management using actual clients.

KNOWLEDGE ACQUISITION AND LEARNING

O'Dwyer et al (2009) found that education provides both explicit and tacit knowledge - the first is acquired with traditional lectures, textbooks and the second is acquired with the student's direct experience, observation of the behaviors and skills used, and time for reflection on those skills. Hoffman et al (2016) argued that field-based consulting classes, where students interact with real world clients in business problem identification and solution-finding, captures both explicit and tacit knowledge. These classes merge the acquisition of explicit knowledge through traditional lecturing with tacit knowledge acquisition through the direct interaction and feedback from actual business owners. The question becomes whether any of these activities create knowledge structures that are resilient and accessible throughout an individual's business career or whether this knowledge is lost soon after the course is completed.

KNOWLEDGE ACQUISITION AND RETENTION

Over the years there has been extensive discussion about what is the best delivery approach to ensure that the student learning goals and objectives of the institution are being taught in a way that will allow for accurate assessment of learning outcomes to occur. In a recent white paper by AACSB (2014) the original outcomes assessment process, as described by the AACSB Assessment Resource Center (2007), are converted into a collection of questions that institutions and faculty can address in developing a comprehensive assessment process. These questions are:

1. What will our students learn in our program? What are our expectations?
2. How will they learn it?
3. How will we know they have learned it or not?
4. What will we do if they have not learned it?

While these questions may provide guidance in establishing an assessment process, they do not address a critical concern of students that what is being taught is being taught in a way that the knowledge will be retained and available to students after they have left school. From this perspective Bechtold and Hoffman (forthcoming) posit that an additional question must also be included in the assessment process:

5. Will our students retain this knowledge after they leave the program?

For this question to be answered institutions must consider the inherent challenges regarding how people learn and retain information, how the educational delivery process enhances or impedes the retention of knowledge, and whether the assessment tools implemented capture outcomes that increase the probability that this knowledge will be retained.

Learning and retention issues

There has been substantial research into teaching modalities that may enhance knowledge retention. Research conducted by the National Training Laboratory of Bethel, Maine in their work on the “Learning Pyramid” attempted to describe what the average retention rate was of adult students for various teaching modalities. They found that average student retention rates through traditional lecturing and reading was 10% or less while practicing and doing enhanced activities raised average retention rates to 75% or higher (Strauss, 2013).

Critics such as Daniel Willingham identified several factors that impact retention which included:

1. What the material is.
2. The age of the subjects.
3. The delay between study and test.
4. What were subjects instructed to do.
5. How was memory tested.
6. What subjects know about the to-be-remembered material (Willingham, 2013).

Dunlosky, Rawson & Marsh, et al (2013) reviewed ten teaching techniques and analyzed quantitative research that had been conducted to establish the efficacy of each technique. The authors found two moderating effects which seemed to have significance influence on how information was processed and retained. The first was the level of prior knowledge of the subject that students had and the second was the amount of time between when the material was studied and when the material was tested. In virtually all instances knowledge retention was measured through a test either during the course or at its end.

Both Willingham (2013) and Dunlosky et al (2013) indicate that the time between information delivery and testing had a significant impact on knowledge retention. Their findings seem to indicate that most measurements of learning and knowledge retention occur on a “one-time” basis following known schedules that allow students ample time to prepare. What much of this research fails to show is whether that knowledge is available to students on demand after they have graduated from college. This, of course,

is a critical argument regarding the value of a university program as questioned Moskal et al (2008) and Arum and Roska (2011). To answer this question, one must not only consider teaching delivery but also how the brain acquires and stores knowledge to determine whether there is alignment to insure long-term knowledge retention.

Neuroanatomy of the brain, learning and retention

When researchers talk about knowledge acquisition and retention they are talking about memories. Yet the term “memory” is not a single activity held in a single repository in the brain. According to the field of neuroscience the term “memory” actually consists of several types of information recall as well as a number of locations in the brain. The intent of these functions is to assist cognition in dealing with life issues and drive certain memories from short-term to long-term in nature.

The two broadest categories of memories are declarative, which deals with facts and events, and non-declarative which deals with skills and habits (Brem, Ran, & Pascual-Leone, 2013). Declarative memory are mostly explicit memories that can be broken into two sub-categories, semantic and episodic. Semantic memories are learned and deal with general facts and knowledge independent of context and personal relevance. Episodic memories are related to experience that the individual has and is extremely contextual to the event (Brem et al, 2013). Non-declarative memory, also described as procedural memory, are memories that deal with skills such as riding a bike and are learned through associative learning such as classical conditioning or by non-associative learning such as reflexive responses (Brem et al, 2013; Robertson, 2009). Often times procedural memory is also considered when describing those skills and abilities that are practiced at a sub-conscious level. Memories can also be classified as to whether they were acquired recently or in the past (often called remote memories) as well as whether the duration of the memory exists for a short-term or a long-term (Moscovitch, Nadel, Winocur, Gilboa & Rosenbaum, 2006; Brem et al, 2013).

Short-term memory (STM), often called primary memory, has been described as an essential component in cognition and is utilized over a very short time period ranging from just a few seconds to a few hours. STM requires a conscious maintenance on the part of the individual and once this maintenance is gone these memories will quickly erode (Brem et al, 2013). Long-term/long-lasting memory (LTM), often called secondary memory, involves the reactivation of past knowledge and experiences. It is the mechanism where memories gain stability and strength and therefore become resistant to interference and degradation (McGaugh, 2000). The natural question is how do memories that require conscious maintenance to exist evolve into memories that are free of conscious maintenance and yet are stable, strong and consistent. This is accomplished through another neurological process called memory consolidation.

Memory consolidation is a process that consists of three milestones which are described as encoding, consolidation and long-term stability, and retrieval (Karni, Meyer & Rey-Hipolito et al, 1998). This process is influenced by hormonal and neural processes as well as molecular and cellular mechanisms and may take hours or even days to complete in the brain. The process also requires many “offline” activities which allows for the release of certain chemicals in the brain and even a sleep state which reduces the amount of noise in the brain and allows the formation of LTM (McGaugh, 2000).

STM and LTM do not appear to act independently of each other. Jonides and colleagues in 2008 concluded that STM may consist of temporarily activated LTM representations. Other studies, using brain imaging techniques, have confirmed this assumption that regions of the brain normally associated with LTM are activated during processes utilizing STM (Wheeler, Petersen & Buckner, 2000).

Working memory (WM) is a temporary active manipulation of information necessary for complex tasks. It draws from both external stimuli that is being experienced as well as internal (retrieved) stimuli from the brain. Baddeley (2000) described WM as an executive activity that draws from visual semantics, language and episodic LTM to help define and solve complex operations. WM allows individuals to focus on relevant stimuli while ignoring irrelevant noise and is considered necessary to successfully complete higher cognitive functions such as decision-making, mental imagery, or language functions (Gazzalery & Nobre, 2012; Brem et al, 2013).

Prospective memory (PM) involves an intention to carry out an action in the future. The future orientation of the action requires that the memory be tagged and retained until it can be activated at the right time or in the appropriate context. PM involves both WM and LTM processes and it has been proposed that as the memory is being encoded by the brain it achieves a special status in part due to its future orientation and activation requirements (Wittman, 2009, Reynolds et al, 2009, Burgess et al, 2011). According to Brem et al (2013) working and prospective memory have a special place in the memory domain as they rely strongly on executive processes.

Finally, it appears that the conversion of a memory from cognitive data used over the short-term to a knowledge database that is available for future executive decision-making may require several features that activate the neurological processes that transform memories from short-term to long-term. These features include a close connection to time perception and attention, the potential future value of the information being stored, and the emotional valence of the memory contents (Brem et al, 2013).

Emotional connection seems to be an additional modifier in creating long-term memories. Students must feel connected to the knowledge. This can be done in one of two ways. The first method would be for instructors to determine what, if any, questions students have that they would like to have answered in the course and work the answers into the material. This could include questions stemming from their past employment or other experiences. Another way of establishing emotional valence is to allow students to see how the knowledge helps them improve their performance. Through practice and practical experience students will use this information to acquire proficiency and, much like a successful athlete, will use that proficiency as a way to enhance personal identity and self-esteem.

This then appears to be the great challenge in teaching and learning. To not just provide students with information to prepare them for a test but rather to provide them with knowledge that they can draw upon throughout their career and adult lives. This knowledge must be delivered to students in a way that allows them to cognitively prepare the knowledge to become a prospective long-term/long-lasting memory as well

as the time to process and transition from short-term memory structures into long-term ones. To accomplish this transition this knowledge must allow students to connect it emotionally to some aspect of their career goals as well as develop practical experience as to how the knowledge can be used in the future.

The relevance of a course in the mind of the student has always been recognized as a critical pathway to knowledge retention. Field-based consulting, with its emphasis on real-world problem solving with an actual client, can provide a much stronger emotional connection to the material being taught, and learned, than more traditional experiential learning exercises such as case studies or in-class exercises or traditional lecturing. A much stronger emotional connection to the knowledge can be more easily established due to the external validation provided by the business client. Even negative feedback from the client can establish neurological pathways that can establish long-term knowledge recall, especially if there is a period of reflection between student and faculty to re-consider the client's problems and issues as well as the proposed recommendations.

FIELD BASED CONSULTING AND KNOWLEDGE RETENTION: A CALL FOR FUTURE RESEARCH

Because field-based consulting programs involve real world clients, students will be exposed to a collection of issues that will impact their ability to critically assess problems their clients are facing as well as developing potential solutions to these problems. Students will have to consider the technical and practical challenges that the client is facing as well as issues related to stakeholder engagement and management such as practices that are considered moral and ethical. Since field based projects will cover most or all of the semester students will have time to critically reflect upon these problems and issues. In most cases this reflection will increase the level of emotional connection to the solutions that they propose. Presentation and client feedback will further increase the emotional connection (positively or negatively) and post-presentation self-reflection will help students determine the future value of the knowledge and, most importantly, provide the quiet time that the brain needs to execute the neurological processes necessary to convert the knowledge from short-term working memory to long-term knowledge retention.

Currently, assessments are based on class material presented by the instructor. The instructor knows what the students will be presented and can base assessment questions on those expectations. However, field-based consulting places students in the real world where frequently students are exposed to unanticipated or unexpected events or issues such as uncooperative clients, unethical clients (Hoffman et al), cash flow, and bankruptcy (Hoffman et al, 2016). These cannot be anticipated and built into pre-determined assessments. Therefore, quantitative measurements will not capture the qualitative results of field-based consulting projects.

Future Research Questions

Theory needs to be further developed that merge what is known about how the brain stores and retains knowledge and the attributes of experiential teaching such as field-

based consulting projects that enhance the conversion of knowledge retention from the short-term to the long-term. Suggested questions should include:

1. What role does the “real-world” aspect of field based consulting have in establishing perceived future value of knowledge and experience? Will that perception activate long term knowledge retention processes in the brain?
2. Does the emotional connection that is developed between client, student and course material over a semester long project enhance brain activity associated with long-term knowledge retention? Do certain projects, clients, or issues build greater emotional connections and therefore greater retention?
3. What role does client feedback have in initiating long-term knowledge retention processes in the brain? What role does feedback from outsiders (judges or community members) during the final presentations affect retention?
4. Does reflection at the individual, team and student/faculty levels, both during and after a field-based project, enhance long-term knowledge retention? If so what reflective measures are best- student reflection papers or other items?
5. Does the knowledge acquired in field based consulting classes remain available to alumni after graduation? If so, what types of knowledge the expected or the unexpected such as a client facing bankruptcy during the class?
6. How long after graduation will this knowledge remain in a stable state and available to alumni?

Clearly many of these questions will require longitudinal studies that will span a much longer time dimension than a single semester or even an academic career. Cohort studies such as those typically found in epidemiologic studies on public health may be the best methodology to answer some of these questions but the inherent cost in terms of time and money may make studies of this type impossible. One-shot surveys of alumni that participated in the class some years after graduation may offer some insights but not without significant effort on the part of faculty who taught the course, researchers who wish to explore the question, school foundations who have access to alumni information, and the alumni themselves. It may also be difficult for alumni many years removed from school to make the connection between field-based activities in school and current problem solutions that may be in a completely different context. For this reason, qualitative research methods (i.e. individual case studies or small focus groups) may be more appropriate in assessing long-term knowledge retention.

CONCLUSION

The question of long-term retention of knowledge acquired in a university setting cuts to the heart of the question regarding the role that universities play in preparing students for future careers. Future studies that reach out to alumni in various stages of their career could provide insight into the role that experiential learning opportunities such as field based consulting has had in developing long-term knowledge retention pathways in the brain. Neurological studies imply that once these pathways are established that the potential that this knowledge would erode is significantly diminished (McGaugh, 2000). A systematic outreach to alumni at various stages of their career would not only provide insight into the effectiveness of student field-based

consulting in developing long-term knowledge retention but also the value that this experience had to the career development of former students.

Without creative and innovative solutions to assessment (Carrell & Willmington, 1996) that reach out beyond the classroom it will be difficult to dissuade some of the criticism that business education has received. However, by merging current teaching and assessment pedagogies with research on the neuro-anatomy of the brain and what must occur for knowledge to be retained one can theorizes on the strengths of field-based consulting in developing the right environment for long-term knowledge retention.

The role of higher education is to prepare students for future career success. However, it is possible that many of the current approaches of teaching and assessment do not create the right knowledge retention environment within the human brain. The basic question that must be asked is whether we are teaching students so that they will be successful in their current course work leading to positive course assessment or will they as alumni of the institution have a foundation of knowledge that can be utilized for unique problem solving throughout their career?

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