



ARBS 2018 PROCEEDINGS

5th Annual Conference

Volume III

March 22-23, 2018

East Tennessee State University

Johnson City, TN



Edited by:

Carolyn Rochelle and Prasun Bhattacharjee

East Tennessee State University

2018 Appalachian Research in Business Symposium

Conference Committee

Carolyn Rochelle, East Tennessee State University (Conference Co-Chair)
Prasun Bhattacharjee, East Tennessee State University (Conference Co-Chair)
Sandra Vannoy, Appalachian State University
Kristen Brewer, Eastern Kentucky University
Steve Ha, Western Carolina University

It is our pleasure to present the *Proceedings of the 5th Annual Appalachian Research in Business Symposium* from the 2018 conference held March 22-23, hosted by the College of Business and Technology at East Tennessee State University. The Appalachian Research in Business Symposium provides a venue for presenting new research, discovering contemporary ideas, and building connections among scholars at Appalachian State University, Eastern Kentucky University, East Tennessee State University, and Western Carolina University.

Acknowledgements:

The Conference Committee for the 2018 Appalachian Research in Business Symposium wishes to extend our gratitude to the College of Business and Technology at East Tennessee State University for hosting this year's event. Additionally, we would like to extend our appreciation to all of the participants and to those colleagues who contributed significant effort in service to the conference.

Keynote Speaker:

Anthony "Tony" Keck, Executive VP System Transformation & Chief Population Health Officer at Ballad Health

Website, Registration and Events:

Kristy Buchanan
Laura Bennington
Lisa Pierce
Tammy Peterson

Session Chairs:

Beichen Liang	Jill Hayter
C. Allen Gorman	Kent Schneider
Dana Harrison	Kurt Loess
Gary Burkette	Prasun Bhattacharjee
Gary Shelley	Umit Saglam
Heather L. Moore	

Reviewers:

Appalachian State University

Betty Coffey Lewis Alexander
Brandy Hadley Sam K. Formby
Dawn Medlin Sandra Vannoy
Jacqui Bergman Steve Leon
Joseph Cazier Regina DeLisse Hartley
Ken White

East Tennessee State University

C. Allen Gorman Michael McKinney
Carolyn Rochelle Prasun Bhattacharjee
Dana Harrison Umit Saglam
Joseph Newhard William Trainor

Eastern Kentucky University

Allen Engle Philip J. Boutin, Jr.
Beth Polin Qian Xiao
Kristen Brewer Weiling Zhuang
Lee Allison

Western Carolina University

Jon Marvel
Scott Rader
Steve Ha
William Richmond

Proceedings Editors:

Carolyn Rochelle
Prasun Bhattacharjee

Table of Contents

Analysis of Agile Learning into Information Systems Project Class: A Cognitive Apprenticeship Approach	5
Xiong, Jie, Appalachian State University	
Tang, Yong, University of Electronic Science and Technology of China	
Medlin, Dawn B., Appalachian State University	
Blocks for Bees: Solving Bee Business Problems with Blockchain Technology	11
Dobbins, Avery, Appalachian State University	
Sprinkle, Alisha, Appalachian State University	
Hadley, Brandy, Appalachian State University	
Cazier, Joseph, Appalachian State University	
Wilkes, James, Appalachian State University	
Business Students' Personal Branding: An Empirical Investigation	17
Allison, Lee, Eastern Kentucky University	
Boutin, Jr., Philip J., Eastern Kentucky University	
Cumiskey, Kevin J., Eastern Kentucky University	
Escalation of Commitment in New Product Evaluation: The Moderating Roles of Goal Gradient and Subgoal Effect.....	24
Liang, Beichen, East Tennessee State University	
Ethical Hacking: Cybersecurity Education for the 21st Century	30
Medlin, B. Dawn, Appalachian State University	
Hartley, Regina D., Appalachian State University	
Full Range Focus: How Regulatory Focus Influences the Relationship between Leader Behavior and Subordinate Outcomes	36
Gorman, C. Allen, East Tennessee State University	
Chavez Reyes, Denise, East Tennessee State University	
Impact of NOL Carryforwards: Subsidizing Startups	43
Beach, Robert, East Tennessee State University	
Onboarding Freshman Business Students: Mindfulness, Learning, and a Business Plan for Life.....	47
Roberson, Michael, Eastern Kentucky University	
Reverse Logistics: Scenarios Related To Drone Deliveries and Returns.....	54
Fowler, Victoria, Appalachian State University	
Medlin, Dawn B., Appalachian State University	
Vannoy, Sandra A., Appalachian State University	
Social Constructivism and Cooperative Learning in Marketing Courses: A Sample In-Class Activity	59
Boutin, Jr., Philip J., Eastern Kentucky University	

Table of Contents (Contd.)

“Team Fracking” – The Unintended Consequences of Bullying Within Work Teams	68
Creasy, Todd, Western Carolina University	
Carnes, Andrew, Western Carolina University	
Technology Transfer Policy Efficiency: The Influence of Diversity and Inclusion	73
Emery, Dan E., Appalachian State University	
King, Austin K., Appalachian State University	
Meyer, Kolbert A., Appalachian State University	
Hadley, Brandy E., Appalachian State University	
The Moderating Effects of Salespersons’ Behaviors on Supplier Integration for New Product Development	85
Oh, Jae-Young, Eastern Kentucky University	
Your Learning Style May Explain Your Emotional Intelligence or Your Emotional Ineptitude.....	92
Moore, T. Winters, East Tennessee State University	

Analysis of Agile Learning into Information Systems Project Class: A Cognitive Apprenticeship Approach

Xiong, Jie
CIS & SCM Department
Walker College of Business
Appalachian State University
Boone, NC 28608 USA
xiongjj@appstate.edu (Contact Author)

Tang, Yong
School of Computer Science and Engineering
University of Electronic Science and Technology of China
Chengdu, Sichuan, China
tangyong@ueste.edu.cn

Medlin, Dawn B.
CIS & SCM Department
Walker College of Business
Appalachian State University
Boone, NC 28608 USA
medlinbd@appstate.edu

Key words: Agile Development, Cognitive Apprenticeship, Information Systems Project, Pedagogical Approaches

Introduction

Agile methods, also known as agile software development methods, are considered as one of the most popular ways of delivering software projects through collaborative teamwork to clients. The past few years have witnessed a significant adoption of agile software development within different industries (Beck, 1999; Cockburn, 2006; Cockburn & Highsmith, 2001; Dingsøyr, Nerur, Balijepally, & Moe, 2012; Dybå & Dingsøyr, 2008; Kruchten, 2013a; J. Sharp & Ryan, 2011). Suitable for various software project scenarios with increasing project uncertainties and changes, agile methodologies vary in different development approaches from iterative to incremental, differentiation cycles from days to weeks, team sizes of small to large, ways of documentation, and varying degrees of customer involvements. Centralized on people, agile methodologies emphasize interactions, workable systems, customer collaboration, and response to changes (Beck et al., 2001). Among these agile methods, Extreme Programming (XP) (Beck, 1999; Beck &

Fowler, 2001) and Scrum (Schwaber & Beedle, 2002) have become the most two popular approaches.

However, very little is known about the learning process and outcomes students majoring in Computer Information Systems (CIS) are being afforded in this field of study. This research utilizes Cognitive Apprenticeship as theoretical to investigate and access the learning process and their outcomes. Cognitive Apprenticeship is a constructivism theory that suggests that students learn from each other through modeling, coaching, scaffolding, articulation, reflection, and exploration (Collins, Brown, & Newman, 2007). The role of agile learning is investigated in the paper. Overall, the research question of the paper is

What's the role of agile learning process in Information System Project classes?

Theoretical Background

Agile methodologies bring changes and impacts on various aspects of software development like business innovation (Highsmith & Cockburn, 2001), the people factors (Cockburn & Highsmith, 2001), the ecosystems (Highsmith, 2002), the principles, patterns, and practices (Martin, 2002), and planning (Beck & Fowler, 2001). All of these expectations can be overwhelming for traditional school education. A gap between industry expectations and academic education related to agile methodologies is under criticism (Fox & Patterson, 2012). Due to limited course time, it is unlikely that all aspects of agile methods can be covered. However, important concepts and values of at least one agile method, XP or Scrum, such as the iterative development, incremental delivery, team-customer interaction driven R&D, continuous integration, and team management etc., are necessary to equip the students with appropriate knowledge in order to be successful in the marketplace. Tan et. al. has suggested that a course on agile should include four factors: team-based guidance, stress on working and integrated software solution, value of progressive and flexible methods, being adaptive to changing requirements (Tan et al., 2008). Agile methods are also taught in advanced capstone courses on enterprise software development which are more complicated in used technologies, project scales, and project management. A communication channel and getting stakeholders onboard is crucial for a semester-long project to deliver workable products (Iyengar, 2009). The agile concepts and methods are the fundamentals for agile software development activities, among which teamwork and customer collaboration are the most important issues in teaching and practicing (Rico & Sayani, 2009).

Also, in the design of pedagogy and curriculum for agile methodologies teaching must consider the student perceptions (Melnik & Maurer, 2005). In their case study of a software engineering course with focus on pairing programming and agile methods, a collaborative pedagogy intervention on student perception is studied and verified a social interaction model of student views (Slaten et al., 2005). Since the teamwork of agile software development emphasizes interactions within the team and with the customers, the full agile project cycle in lab courses can benefit students in developing technical skills as well as inter-personal social skills (Schwaber, 2004). These repeated practices of applying agile methods in software development projects courses are essential for students to form a habit and thinking of agile values and practices, through which students can turn to be skilled engineers in the long run. Also this kind of agile methods education can be called sustainable (Martin Kropp & Meier, 2014).

Research Methodology and Data Collection

The research adopts a collective case study approach (Benbasat, Goldstein, & Mead, 1987) to investigate the learning outcomes as well as the learning process. Cognitive apprenticeship is utilized as the theoretical lens to further identify key processes that are important in student learning.

Client Information	Project Description	Methodology	Types of IT Utilized	Outcomes and Sustainable Development	Students' Reflections
Center for Entrepreneurship	Database for volunteers	Agile	Drupal 7 Google computing environment	Maintenance free after implementation, easy to use	Project was successful
Student Club	Information Systems for AITP members	Waterfall	Draw.io, Microsoft Visual Studio, C#	Manage membership information, event attendance information, and accounting/financial information	The new system grants 24/7 access to all needed information
Startup that reviews local breweries	Mobile Applications	Agile/Scrum	Appery.io, AppMakr	Help offer local breweries information	Excellent project to undertake within a semester and a valuable learning experience
Swatching company	Mobile Information Systems	Prototyping	iPad, Gmail.	Reduce cost and enhance productivity	Increase sustainability by eliminating paper based communication
Women's Rugby team	Online Payment Systems	Agile/Scrum	Wix, Square (POS), Google Docs	Enables client to easily and efficiently collect dues from team members	Helps sports team
Cookie Company	Online Mobile Ordering Systems	Waterfall	HTML5, Google Docs, PHP, MySQL	Improves the customer's online shopping experience	Helps local small business
Cosmic Karma	Website	Rapid-application development	Google web developer tool, Wix	Enhances product sales, marketing, company credibility/image and long-term equity	Supports local small business
Advanced Radiology	Peer review system for radiologists	Agile/Scrum	HTML5, CSS3, JavaScript, PHP7, and SQL.	Decreases Operational Cost, Decreases Malpractice Costs	Increases Client Satisfaction
Local small business	Website	Combined Waterfall/Agile	HTML, CSS, PHP.	Allows better communication with potential clients	Supports local small business
MBA Graduate Office	Database	Waterfall	MySQL Workbench and Visual Studio	Increased time efficient and security	Supports the university
University Tech Support	Online Information Systems	Waterfall/ Rapid application development (RAD)	HTML5, Bootstrap3, JavaScript, Durple, CSS	Provides increased work performance, employee satisfaction, accountability	Reduce paper based application, increases sustainability
Local Flower Shop	Website	Waterfall	SquareSpace	Increases long-term customer satisfactions	Supports local small business
A pre-clinical stage pharmaceutical company	Data Storage and Analytics IT System	Prototyping	SQL, C#, HTML/CSS	Significant cut down in paper used	Supports local small business

Table 1. Students Project Summary

Data Analysis and Results

Data was collected in two regular semesters in 2017. Overall, there are 13 cases included in the analysis. Detailed information can be found in Table 1.

Based on the cases, Coaching, Scaffolding, and Reflection are identified as the key frames that support the agile learning process within this study. Coaching includes feedback offering and task performance evaluation from the instructors. Based on the data, all 13 cases involve certain coaching from the instructors as well as from the students. For example, some students in the group have better knowledge in programming, while others have more advanced experiences in project management. Agile learning in a group setting provides students a learning environment that support active learning. Scaffolding in the frame suggests that agile learning is supported by the methods as well as strategies that are designed early. Finally, reflection throughout the two semesters from students and clients further offer opportunities for students to look back and challenge them to address future problem-solving processes.

Conclusions

In this paper, we apply cognitive apprenticeship theory into an IS project class in order to analyze the agile methodology learning process of students, as well as further understand how students can analyze, design, create, and implement an IS project for clients within the local community to support their sustainable development. Through the collective case study method, 13 cases are analyzed. More detailed analysis is needed for future research.

References

- Beck, K. (1999). Embracing change with extreme programming. *Computer*, 32(10), 70–77. <https://doi.org/10.1109/2.796139>
- Beck, K., Beedle, M., van Bennekum, A., Cockburn, A., Cunningham, W., Fowler, M., Thomas, D. (2001). Manifesto for Agile Software Development. *Manifesto for Agile Software Development*. Retrieved from <http://www.agilemanifesto.org/>
- Beck, K., & Fowler, M. (2001). *Planning extreme programming*. Addison-Wesley Professional.
- Benbasat, I., Goldstein, D. K., & Mead, M. (1987). The Case Research Strategy in Studies of Information Systems. *MIS Quarterly*, 11(3), 369. <https://doi.org/10.2307/248684>
- Cockburn, A. (2006). *Agile software development: the cooperative game*. Pearson Education.
- Cockburn, A., & Highsmith, J. (2001). Agile software development, the people factor. *Computer*, 34(11), 131–133. <https://doi.org/10.1109/2.963450>
- Cockburn, A., & Highsmith, J. (2001). Agile software development: The people factor. *Computer*, 34(11), 131–133. <https://doi.org/10.1109/2.963450>

- Collins, A., Brown, J. S., & Newman, S. E. (2007). Cognitive Apprenticeship: Teaching the craft of reading, writing and mathematics. *Knowing Learning and Instruction*, 8(1), 453–494. [https://doi.org/\[BBB14200\]](https://doi.org/[BBB14200]), [MGG06460]
- Dingsøyr, T., Nerur, S., Balijepally, V., & Moe, N. B. (2012). A decade of agile methodologies: Towards explaining agile software development. *Journal of Systems and Software*, 85(6), 1213–1221. <https://doi.org/http://dx.doi.org/10.1016/j.jss.2012.02.033>
- Dybå, T., & Dingsøyr, T. (2008). Empirical studies of agile software development: A systematic review. *Information and Software Technology*, 50(9–10), 833–859. <https://doi.org/10.1016/j.infsof.2008.01.006>
- Fox, A., & Patterson, D. (2012). Crossing the software education chasm. *Communications of the ACM*, 55(5), 44. <https://doi.org/10.1145/2160718.2160732>
- Highsmith, J. (2002). *Agile Software Development Ecosystems*. Boston, MA, USA: Addison-Wesley Longman Publishing Co., Inc.
- Highsmith, J., & Cockburn, A. (2001). Agile software development: the business of innovation. *Computer*, 34(9), 120–127. <https://doi.org/10.1109/2.947100>
- Iyengar, S. R. (2009). Teaching Enterprise Software Development in Undergraduate Curriculum. In *Proceedings of the 10th ACM Conference on SIG-information Technology Education* (pp. 29–32). New York, NY, USA: ACM. <https://doi.org/10.1145/1631728.1631739>
- Kropp, M., & Meier, A. (2013). Teaching agile software development at university level: Values, management, and craftsmanship. In *2013 26th International Conference on Software Engineering Education and Training (CSEET)* (pp. 179–188). <https://doi.org/10.1109/CSEET.2013.6595249>
- Kropp, M., & Meier, A. (2014). New sustainable teaching approaches in software engineering education: How agile methods influence teaching software engineering. *IEEE Global Engineering Education Conference, EDUCON*, (April), 1019–1022. <https://doi.org/10.1109/EDUCON.2014.6826229>
- Kruchten, P. (2013a). Contextualizing agile software development. *Journal of Software: Evolution & Process*, 25(4), 351–361. <https://doi.org/10.1002/smr.572>
- Kruchten, P. (2013b). Contextualizing agile software development. *Journal of Software: Evolution & Process*, 25(4), 351–361. <https://doi.org/10.1002/smr.572>
- Martin, R. C. (2002). *Agile software development: principles, patterns, and practices*. Prentice Hall.
- Melnik, G., & Maurer, F. (2005). A cross-program investigation of students' perceptions of agile methods. In *Proceedings. 27th International Conference on Software Engineering, 2005. ICSE 2005*. (pp. 481–488). <https://doi.org/10.1109/ICSE.2005.1553593>
- Rico, D. F., & Sayani, H. H. (2009). Use of Agile Methods in Software Engineering Education. In *2009 Agile Conference* (pp. 174–179). <https://doi.org/10.1109/AGILE.2009.13>

Schwaber, K. (2004). *Agile Project Management With Scrum*. Redmond, WA, USA: Microsoft Press.

Schwaber, K., & Beedle, M. (2002). *Agile software development with Scrum*. Prentice Hall Upper Saddle River.

Sharp, J. H., Ryan, S. D., & Prybutok, V. R. (2014). Global Agile Team Design : An Informing Science Perspective, *17*, 175–187.

Sharp, J., & Ryan, S. (2011). Best Practices for Configuring Globally Distributed Agile Teams. *Journal of Information Technology Management*, *XXII*(4), 56–63. Retrieved from <http://jitm.ubalt.edu/XXII-4/article4.pdf>

Slaten, K. M., Droujkova, M., Berenson, S. B., Williams, L., & Layman, L. (2005). Undergraduate student perceptions of pair programming and agile software methodologies: verifying a model of social interaction. In *Agile Development Conference (ADC'05)* (pp. 323–330). <https://doi.org/10.1109/ADC.2005.48>

Tan, C.-H., Tan, W.-K., & Teo, H.-H. (2008). Training Students to Be Agile Information Systems Developers: A Pedagogical Approach. In *Proceedings of the 2008 ACM SIGMIS CPR Conference on Computer Personnel Doctoral Consortium and Research* (pp. 88–96). New York, NY, USA: ACM. <https://doi.org/10.1145/1355238.1355259>

Blocks for Bees: Solving Bee Business Problems with Blockchain Technology

Dobbins, Avery
dobbinsal@appstate.edu

Sprinkle, Alisha
sprinkleam@appstate.edu

Hadley, Brandy
hadleybe@appstate.edu

Cazier, Joseph
cazierja@appstate.edu

Wilkes, James
wilkesjt@appstate.edu

Center for Analytics Research and Education
Walker College of Business
Appalachian State University
416 Howard Street
Boone, NC 28607-2037

Key words: Blockchain, bees, honey, pollination, smart contracts

Introduction

This paper will discuss the role that distributed ledger technology, more commonly referred to as Blockchain Technology, can serve in alleviating some of the business problems faced by commercial beekeepers. Specifically we will illustrate how blockchain can be used to reduce honey adulteration, develop smart pollination contracts, and improve the apiary insurance market. By collecting repeated electronic measurements of hive characteristics and performance, accurate models of production can be created for both individual hives and apiaries or larger demographic categories. Importantly, by utilizing the cryptographically secure nature of blockchain to store accurate and distinguishable data about individual beehives, which can later be audited to ensure characteristic validity, it is possible to remove many of the information asymmetries which exist in markets related to beekeeping.

Literature Review

When thinking of blockchain, most think of Bitcoin and cryptocurrency. This is the most popular use of the blockchain due to its secure nature and anonymous transactions (Nakamoto, 2008). However, blockchain can be utilized as a public ledger through a decentralized trustless system with much broader applications than as a currency (Swan, 2015). Blockchain has been demonstrated as a useful tool for agricultural product tracking (Kim & Laskowski, 2017), streamlining and protecting global supply chains (Kumar & Iyengar, 2017), and safeguarding the anonymity and collectivity of client records in the healthcare industry (Ekblaw, Azaria, Halamka, & Lippman, 2016). Blockchain can also be used to create and govern “smart contracts” in an open and transparent form for all parties involved. Utilizing the open ledger nature of the technology, temporary worker contracting has previously been explored, revealing a potential to eliminate external oversight conditions in agreements (Pinna & Ibba, 2017).

The Value in Blockchain

In order to capture the benefits of blockchain technology, data must first be collected from hives. Currently a large majority of beekeepers keep paper records and utilize largely qualitative measures of performance and health such as estimations of honeybee cluster size or space available for new comb to be drawn. In addition to these measures, by collecting quantitative electronic variables, it is possible to build a much more complete picture of a hive’s overall condition. Through the measurement of well defined criteria, it is possible to perform much more accurate and meaningful analysis. By installing a suite of affordable and simple measuring devices, data on temperature and humidity within the hive, as well as location, elevation, weight, and time of day can be aggregated and sent to cloud storage for automatic analysis. From here the production data can be used to elicit characteristics about quantity of honey produced, pollination activities, as well as hive health and physical conditions. Finally the sourced data along with the statistical elicitation can be recorded in a blockchain which explicitly ties the measurements to the specific hive of origin. The field of agriculture has already seen blockchain implemented. In China, chickens are traceable on a blockchain through a company called Gogochicken. This traceability security that blockchain provides can extend to beekeepers and honey suppliers as well.

At a fundamental level, blockchain is data you can trust. Data is bound to a strict framework using cryptography and hashing algorithms to create a database, or chain, based on a preceding transaction. This means that it is mathematically impossible to change data once it has been set without evident tampering, thus providing data integrity. You can confirm that your data is true as of the time it was recorded dating back to the first transaction that occurred. Because this data is stored in the cloud, it can be analyzed by researchers to better predict future outcomes and trends.

Potential Implications

Honey Adulteration

Honey Adulteration is the practice of diluting otherwise pure honey with other syrups in an effort to produce higher volumes of product at lower costs with less volatility. US apiaries produced an

estimated 149 million pounds of honey in 2013. However US consumption of honey was over 410 million pounds; more than twice as much (US Honey Industry Report 2015, Bee Culture Magazine). This illustrates the large existing demand which has been increasing the price of honey steadily over the last decade. This high demand coupled with the recent decline in bee populations (Ellis, Evans, & Pettis, 2010) and the difficult nature of distinguishing pure honey from adulterated products has led to large incentives for producers and suppliers to dilute their honey products, providing unknowing consumers with lower quality goods. This is particularly troubling because by artificially raising the quantity of honey at market, the valuation of pure honey is depressed below its otherwise equilibrium price. This makes it difficult for beekeeping to be profitable and makes the recently increasing mortality rate of bees even more devastating.

Blockchain solutions to this problem are promising however. By tying the data about weight before and after honey collection to each specific jar or container of honey produced it becomes possible for consumers and finished goods producers to easily determine the honey they purchase is genuine by referencing the data stored in a blockchain. Further, this process allows for consumers to know *exactly* which apiary their honey was harvested from and allows for specialization within the market such as mānuka honey which can originate only in areas indigenous to the mānuka tree (Russell, Molan, Wilkins, & Holland, 1990). This leveling of information asymmetries effectively allows beekeepers to separate the market for pure honey from the market of honey which may be adulterated. Since we can assume that pure honey is preferable in all cases where one would use possibly adulterated honey we can safely say that this would raise the price of pure honey, increasing price efficiency and largely mitigating the depressive effects adulteration has on honey prices.

Smart Contracting

Blockchain also has implications in the US pollination market, which is dominated by bees and beekeepers, where more than \$410 million is reported as pollination income yearly (USDA, 2017). Bees are integral in the production process of the large majority of all fruits, vegetables, and nuts sold to consumers (Morse & Calderone, 2000). However, current pollination contracts often leave hives open to dangers such as pesticides from adjacent fields and physical damage from farm equipment, leaving little recourse for beekeepers who are taking on these risks. A smart contract is a piece of code which is stored in the blockchain network. It defines the conditions to which all parties using a contract agree. If all required conditions are met, certain predefined actions, such as payment for a service, follows automatically. Adopting blockchain open ledger technology would allow both beekeepers and farmers to be aware of when bees are performing and contract obligations are being fulfilled, creating evidence based payment criteria. This would also greatly further the use of pay for performance type contracting conditions. By using encrypted data to reveal differences in pollination activity, both beekeepers and farmers would be able to more accurately attribute results to the work done by individual beehives, with certainty in the recorded data, and charge for them accordingly. The data collection behind blockchain technology can also provide for heightened response times in the event of damage to hives by alerting beekeepers to drastic changes in the characteristic data collected, allowing for both pollination contracts to be better fulfilled and bees to be better protected from dangers involved in servicing farms. Similarly, currently the market for pollinators is very closed. Most contracts are formed by word of mouth connections or through industry brokers acting as middlemen, but by collecting data on apiaries it

is possible to create an avenue for more efficient, data driven pollinator matchmaking.

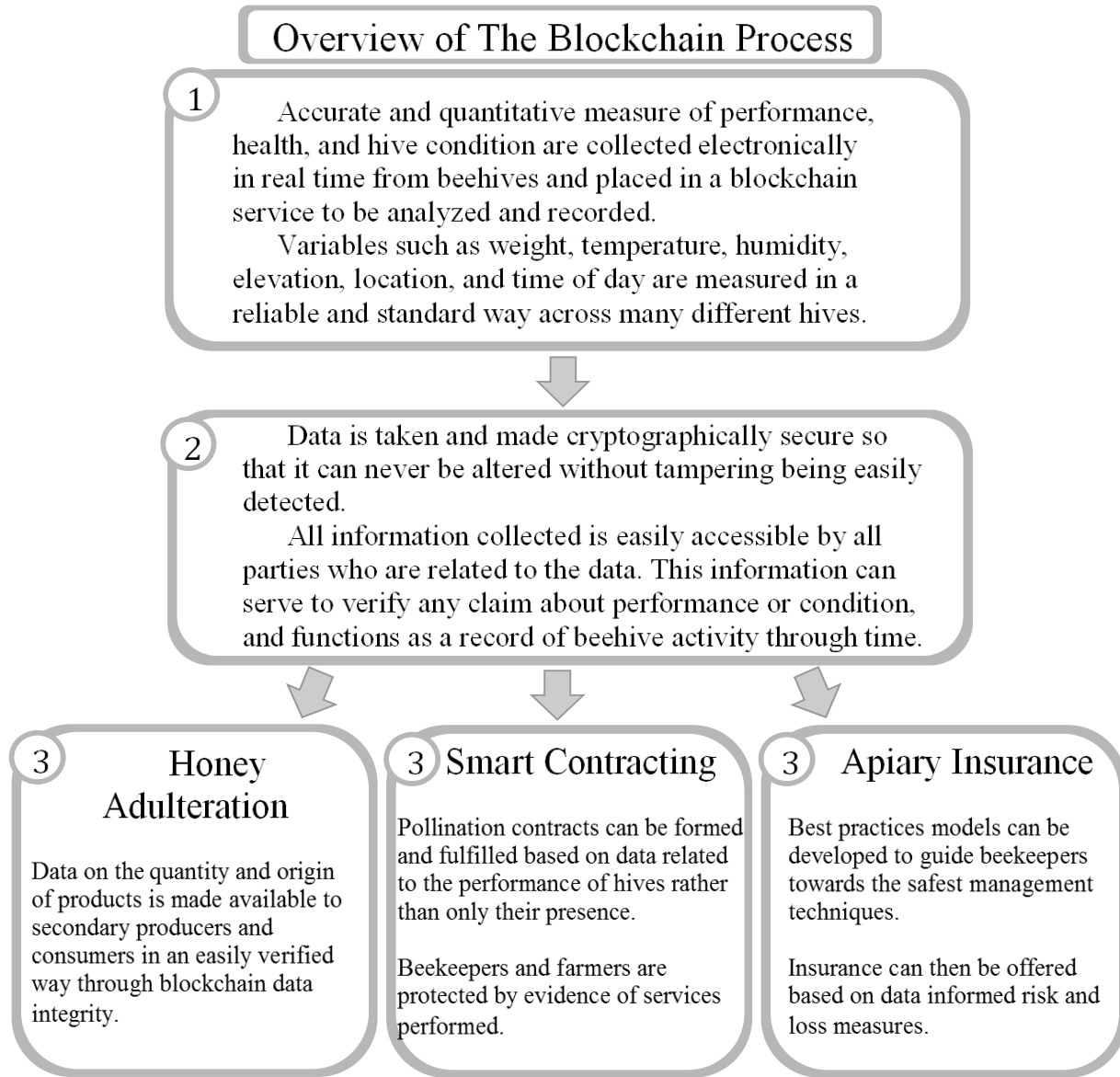


Figure 1. Overview of the Blockchain process

Insurance Industry

Finally, blockchain has the potential to enable the development of an apiary insurance industry. By collecting data on bee health, such as weight, population, population life-stage distribution, temperature, and a wide range of other indicators, thus providing a dataset for comparison, insurance companies would be able to create better predictions on colony loss and the factors

which affect honey yields, creating a best practices model for beehive maintenance and loss prevention. These more accurate predictions would remove a substantial amount of uncertainty around the investment for insurers allowing them to insure more beekeepers and hives, therefore have more acute risk premiums. The implication of the records being cryptographically secure also provides an important auditing and fraud prevention system for insurers. Because of the unalterable nature of blockchain open ledger technology, insurers could evaluate the characteristics of any or all hives from a beekeeper participating in the program and compare the data collection to insurance claims and determine whether a beekeeper has followed a relevant best practices approach to mitigate potential loss. Both of these uses make the beekeeping trade more stable. Almost all beekeepers have experienced large losses at some point in their career. Due to the current absence of an efficient apiary insurance market this often results in a heavy financial burden. Through the adoption of this technology, those events can be reduced and their fiscal repercussions can be lessened by an effective insurance cushion.

Conclusion

By joining a system of electronic data collection, data storage, and validation through Blockchain, it is possible to remove many of the principle/client and producer/consumer information asymmetries which make the beekeeping industry inefficient and slow to technological change. Creating a database of beehives and their characteristics enables improvement in the efficacy and immediacy of many beekeeping practices. By compounding these benefits with cryptographically secure record keeping, the industry could ensure consumers of the sources of their honey products while alleviating any market detriments adulterated products pose, create more fruitful pollination contracts for both beekeepers and farmers, as well as open the doors to insurance markets for beekeeping. Meanwhile, the data developed through these technological improvements has the potential to improve the life and survivability of honeybees by making beekeeping a more accessible and researchable industry.

References

- Ekblaw, A., Azaria, A., Halamka, J. D., & Lippman, A. (2016, August). A Case Study for Blockchain in Healthcare: “MedRec” prototype for electronic health records and medical research data. In Proceedings of IEEE Open & Big Data Conference.
- Ellis, J. D., Evans, J. D., & Pettis, J. (2010). Colony losses, managed colony population decline, and Colony Collapse Disorder in the United States. *Journal of Apicultural Research*, 49(1), 134-136.
- Kim, H. M., & Laskowski, M. (2017). Blockchain: Promise of Economy, Sustainability, and Transparency for Global Food Production. SSRN Working Paper #3028164.
- Kumar, M. V., & Iyengar, N. C. S. (2017). A Framework for Blockchain Technology in Rice Supply Chain Management.

Morse, R. A., & Calderone, N. W. (2000). The value of honey bees as pollinators of US crops in 2000. *Bee Culture*, 128(3), 1-15.

Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system.

Pinna, A., & Ibba, S. (2017). A blockchain-based Decentralized System for proper handling of temporary Employment contracts. *arXiv preprint arXiv:1711.09758*.

Russell, K. M., Molan, P. C., Wilkins, A. L., & Holland, P. T. (1990). Identification of some antibacterial constituents of New Zealand manuka honey. *Journal of Agricultural and Food Chemistry*, 38(1), 10-13.

Swan, M. (2015). *Blockchain: Blueprint for a new economy*. O'Reilly Media, Inc.

U.S. Honey Industry Report – 2015. (2016). *Bee Culture*. Retrieved from <http://www.beeeculture.com/u-s-honey-industry-report-2015-2/>.

USA. United States Department of Agriculture. (2017). *Honey* (ISSN 1949-1492). National Agricultural Statistics Service (NASS), Agricultural Statistics Board.

Business Students' Personal Branding: An Empirical Investigation

Allison, Lee

Department of Management, Marketing, and International Business
College of Business & Technology
Eastern Kentucky University
521 Lancaster Avenue, BTC 142
Richmond, KY 40475
lee.allison@eku.edu
859.622.8944 (Contact Author)

Boutin, Jr., Philip J.

Department of Management, Marketing, and International Business
College of Business & Technology
Eastern Kentucky University
521 Lancaster Avenue, BTC 124
Richmond, KY 40475
philip.boutin@eku.edu
859.622.4981

Cumiskey, Kevin J.

Department of Management, Marketing, and International Business
College of Business & Technology
Eastern Kentucky University
521 Lancaster Avenue, BTC 143
Richmond, KY 40475
kevin.cumiskey@eku.edu
859.622.7016

Key words: Personal branding, social media, employment

Introduction

Personal branding is the process by which an individual actively tries to manage others' impression of their skills, abilities and experiences (Johnson, 2017). It is the marketing of oneself to society (Lair, Sullivan, & Cheney, 2005; Peters, 1997; Shepherd, 2005). While the current job market is touted as being the best in years, employment opportunities for business aspirants in the U.S. economy changed little from 2017 to 2016 when comparing a United States Department of Labor annual report ("United States Department of Labor," 2018). This suggests that new business graduates continue to face the harsh reality of a challenging environment in terms of future employment prospects. This accentuates a great need for business schools to arm students with the personal branding skills requisite for today's competitive employment landscape.

Literature Overview

Tom Peters is largely credited with introducing the concept of personal branding in a piece he wrote for *Fast Times* in 1997 (Peters, 1997). Subsequently, the flames of this fiery concept were fueled by the introduction of a vast array of social media tools that could be leveraged toward personal branding aims, igniting both research and practical interest. Inarguably, employment challenges in the economy continue to confront the last exodus of graduating Millennials as well as their successors dubbed Plurals (Duffett, 2017). Therefore, it becomes increasingly important that business colleges first work with students to encourage the embrace of the personal branding concept. Second, business colleges must assist students in their quest to execute it flawlessly.

It's inarguable that Millennials have a high level of experience when it comes to using social media. Historically, this is exceeded only by the social media fluency of the Plurals. That said, there is a alarming disconnect between social media usage and personal branding strategy. Given some reflection, this is unsurprising. The former attends a consumer perspective, while the latter attends to a savvy business mindset. Presumably, business graduates have been trained in developing just that: a business perspective. It stands to reason that such a perspective would be extended to marketing "self" among university business students. Surely, such students should actively develop and execute a personal branding strategy, but do they? Answering this question is important as it has tremendous bearing on the what the future will deliver to future business graduates, as well as to what will be said of the preparation they are receiving in institutions of higher learning. It has taken years for firms to develop effective social media strategy for their organization and their brands. Initially, even executives shunned social media because they didn't understand it or comprehend how it could best be leveraged. In recent years, researchers have worked to identify challenges that individuals face in attempting to create personal brands (Labrecque, Markos, & Milne, 2011). Building upon that research, this paper seeks to investigate the extent to which current business students embrace the personal branding concept, as well as their perception of the efficacy of personal brand management and how this impacts their perceptions of personal brand authenticity and self-actualization. According to Bandura's self-efficacy theory, individuals' self-beliefs provide the impetus for achievement, serving as a "working model" for their respective world, and these thoughts, or cognitive processes exert determinative influence (Bandura, 2001, pp. 3-4). For this reason, our model begins with an initial assessment of students' beliefs as it relates to the notion of individuals existing as unique individual brands. We hypothesize that individuals who have this cognition will act accordingly in an attempt to design courses of action that allow them to manage this particular perspective. Such individuals will "transcend the dictates of the immediate environment...to produce positive outcomes" (Bandura, 2001, p. 7) with regard to their personal branding. Thus, we expect that personal brand self-efficacy will influence individuals' attainment of important outcome expectations, or their goals of self-actualization. This is based on Bandura's work that suggests that efficacy expectations mediate outcome expectations via behavior. This is important because it is insufficient for an individual to believe that a certain course of action will lead to any given outcome. In order to give rise to the course of action, the individual must also believe that he possesses the ability to perform the requisite activities for the course of action. Further, we hypothesize that authenticity mediates personal branding efficacy's influence on self-actualization goals. Authenticity is viewed as the essence of well-being and healthy functioning (Wood, Linley, Maltby, Baliousis, & Joseph, 2008). These researchers also suggest that living authentically

implies that one lives in accordance to one's own values and beliefs. In uncertain environments (such as that attending the transition from college to a profession), individuals seek more authenticity in their daily lives. This impacts products they consume, brands they own (Bruhn, Schoenmüller, Schäfer, & Heinrich, 2012), and likely, the brands they become. Thus:

H1: Brand concept beliefs positively influence students' personal brand authenticity.

H2: Brand concept beliefs positively influence students' brand management efficacy.

H3: Brand management efficacy positively influences students' personal brand authenticity.

H4: Personal brand authenticity positively influences students' perceptions of self-actualization.

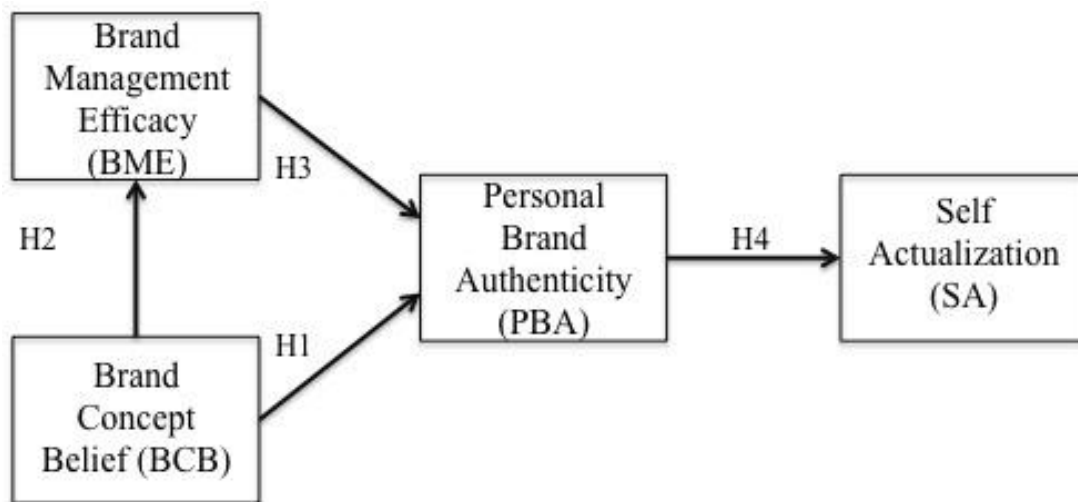


Figure 1. Hypothesized Model

Methodology

We adopted a survey approach using Qualtrics. Prior to launching the study, questionnaire items were examined by students and professors to insure that typical respondents comprehended the survey items and that the items had acceptable construct validity and reliability. Minor modifications were made based on the pre-test with students and subject matter experts. We used a structural equation modeling (SEM) approach because SEM provides researchers with the advantage of simultaneously fitting both the measurement and structural models that simultaneously represent a complete set of interrelated relationships among unobserved constructs, while also estimating measurement error (Hair, Jr., Black, Babin, & Anderson, 2010; Kline, 2011).

Our sample consisted of 117 undergraduate business students from a large university student body in the south region of the United States. The survey was administered online using Qualtrics and a QR code for mobile devices. A drawing of small cash prizes was held in order to incentivize students to complete the survey. The gender distribution was 44% male and 56% female. Table 1 displays the correlations among constructs.

<i>Variable</i>	BCB	BME	PBA	SA
BCB	-			
BME	.57**	-		
PBA	.71**	.77**	-	
SA	.36**	.53**	.53**	-

Table 1. Correlation Matrix

Note. BCB = brand concept belief; BME = brand management efficacy; PBA = personal brand authenticity; SA = self-actualization; n = 117. **Indicates a .01 significance level (2-tailed).

Students responded to a 7-point multi-item Likert scale (1=strongly disagree; 7=strongly agree) to capture the constructs under investigation. To the extent possible, we adapted constructs from measurement scales used in prior studies to fit the personal branding context. Personal brand authenticity captures the dimension of authentic living which involves the brand “being true to oneself and in accordance to one’s values and beliefs” (Wood, Linley, Maltby, Baliousis, & Joseph, 2008, p. 386). Items measuring *personal brand authenticity* were adapted from Wood et al. (2008). We define brand management efficacy as “one’s belief in one’s overall competence to effect requisite performance” (Chen, Gully, & Eden, 2001, p. 63) in the management of one’s personal brand. Items measuring personal brand management efficacy (e.g., *I can perform many personal branding tasks effectively; I can obtain personal brand outcomes that are important; When facing difficult personal branding tasks, I am certain that I will accomplish them; I will be able to achieve most of the personal brand goals that I have set; Compared to others, I can do personal branding tasks well; Even when things are tough, I can perform personal branding quite well*) were adapted from Chen and colleagues’ (2001) general efficacy scale. The wording was adapted to focus on personal branding. *Brand Concept Belief* is a two-item measure that captures whether participants consider themselves and others to be brands (i.e., *I consider each individual to be a unique brand; I consider myself to be a unique brand*). Self-actualization is “feeling that you are developing your best potentials and making life meaningful” (Sheldon, Elliot, Kim, & Kasser, 2001, p. 339). Items measuring *self-actualization* (e.g. *I am becoming who I really am; I feel a sense of deeper purpose in my life; I feel a deep understanding of myself and my place in the world*) were based on the work of Sheldon and colleagues (Sheldon et al., 2001).

Results and Implications

We began our examination of the modeled relationships using confirmatory factor analysis (CFA). All factor loadings were significant loading on intended latent construct indicating internal consistency. Composite reliability coefficients (CR) and Cronbach alpha (CA) coefficients meet adequacy thresholds (Hair, Jr. et al., 2010; Kline, 2011) with all Cronbach alphas and composite reliabilities above 0.78. Additionally, all average variance extracted (AVE) values were greater than 0.62, indicating construct validity. Further, with the exception of the values for personal brand authenticity, the largest shared variance (LSV) of all variables was 59%, lower than the lowest AVE of 62%, lending support for discriminant validity (Fornell & Larcker, 1981; Kline, 2011). In sum, measures demonstrate both convergent validity and reliability (Bagozzi, 1980; Fornell & Larcker, 1981). Results of the means, standard deviations and measurement analysis are shown in Table 2. Estimation of the structural model resulted in a model with good fit, $\chi^2(23) = 48.942$,

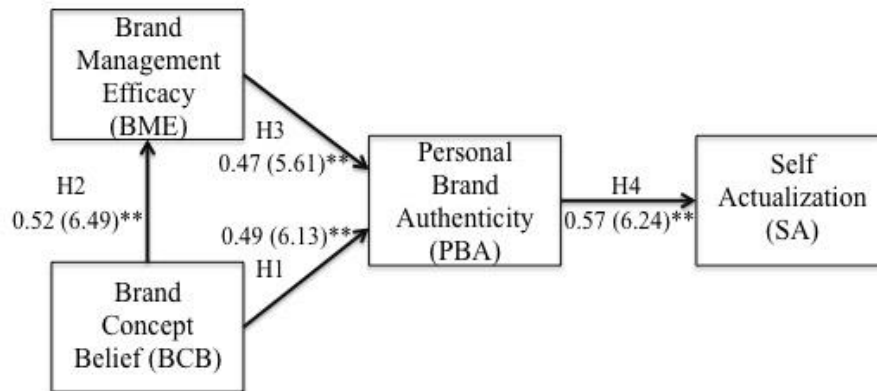
RMSEA = 0.08, 90% CI [0.53, 0.12], CFI = 0.97, TLI = 0.95, SRMR = 0.049. RMSEA values are generally considered acceptable at 0.07 or below.

Variable	M	SD	AVE	LS	CR	α
1. Brand Concept Belief	6.04	1.09	0.7	0.00	0.87	0.87
2. Brand Management	5.22	1.08	0.7	0.59	0.81	0.81
3. Personal Brand	5.89	1.00	0.6	0.59	0.78	0.78
4. Self-Actualization	5.22	1.14	0.7	0.00	0.84	0.84

Table 2. Means, Standard Deviations and Measurement Analysis

However, RMSEA “tends to overreject true population models at small sample size and thus less preferable when sample size is small. We report RMSEA, but our study is a small size. We report results consistent to the 2-presentation strategy (Hu & Bentler, 1999), which rejects reasonable proportions of various types of true-population and misspecified models. Here the CFI is higher than 0.96 and the SRMR is lower than 0.08.

Results are presented in Figure 2., and indicate that the relationships in our theoretical model were supported. H1: Brand concept beliefs positively influence students’ personal brand authenticity ($\beta = 0.49, p < 0.01$). H2: Brand concept beliefs positively influence students’ brand management efficacy ($\beta = 0.52, p < 0.01$). H3: Brand management efficacy positively influences students’ personal brand authenticity ($\beta = 0.49, p < 0.01$). H4: Personal brand authenticity positively influences students’ perceptions of self-actualization ($\beta = 0.57, p < 0.01$).



$\chi^2 (23) = 48.942$, RMSEA = 0.08, 90% CI [0.53, 0.12], CFI = 0.97, TLI = 0.95, SRMR = 0.049. Standardized coefficients shown (z-scores in parenthesis). Significance values = ** $p < 0.01$.

Figure 2. Latent Structural Equation Model Results

Conclusion

Additional research is necessary to replicate findings and build on our model's relationships. Our cross-sectional study uses a small sample of students in a single college of one university in a specific (small) region of the U.S. This substantially limits the generalizability of our findings. Additional research should investigate how students approach personal branding management in a variety of colleges, regions and cultures. Future research should seek to expand upon these findings to improve our understanding of how undergraduate students embrace the personal branding concept and their assessments of self-efficacy at implementing personal brand management strategies. It would also be useful to study these relationships among students over time, and conduct experiments with different university programs that assist students in these endeavors. Our study suggests this is important and worthwhile because when students effectively present an authentic brand, they attain greater levels of self-actualization. This has implications for their assessment of progression in life beyond college toward satisfying employment. Based on our study, the university experience should provide students with the tools for effective personal brand management early and throughout their college study. Undoubtedly, students turn their attention to the need for personal branding as they approach graduation or immediately thereafter.

Such delays may disadvantage them in their search for meaningful, satisfying employment, because personal branding is a long-term strategy that should be undertaken well before graduation is at hand.

References

- Bagozzi, R. P. (1980). *Causal Models in Marketing*. New York: Wiley & Sons.
- Bandura, A. (2001). Social Cognitive Theory: An Agentic Perspective. *Annual Review of Psychology*, 52, 1–26.
- Barrett-Lennard, G. T. (1998). *Carl Rogers' helping system: Journey and substance*. London: Sage.
- Bruhn, M., Schoenmüller, V., Schäfer, D., & Heinrich, D. (2012). Brand Authenticity: Towards a Deeper Understanding of Its Conceptualization and Measurement. *Advances in Consumer Research*, 40, 567–576.
- Chen, G., Gully, S. M., & Eden, D. (2001). Validation of a New General Self-Efficacy Scale. *Organizational Research Methods*, 4, 62–83.
- Duffett, R. G. (2017). Influence of Social Media Marketing Communications on Young Consumers' Attitudes. *Young Consumers*, 18, 19–39.
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 39–50.

Hair, Jr., J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis*. Upper Saddle River, NJ: Prentice Hall.

Hu, L., & Bentler, P. M. (1999). Cutoff Criteria For Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*, 1–55.

Johnson, K. M. (2017). The Importance of Personal Branding in Social Media: Educating Students to Create and Manage their Personal Brand. *International Journal of Education and Social Science*, *4*, 21–27.

Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling*. New York: Guilford Press.

Labrecque, L. I., Markos, E., & Milne, G. R. (2011). Online Personal Branding: Processes, Challenges, and Implications. *Journal of Interactive Marketing*, *25*, 37–50.

Lair, D. J., Sullivan, K., & Cheney, G. (2005). Marketization and the Recasting of the Professional Self: The Rhetoric and Ethics of Personal Branding. *Management Communication Quarterly*, *18*, 307–343.

Peters, T. (1997). The Brand Called You. *Fast Company*, 1–8.

Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What Is Satisfying About Satisfying Events? Testing 10 Candidate Psychological Needs. *Journal of Personality and Social Psychology*, *80*, 325–339.

Shepherd, I. D. H. (2005). From Cattle and Coke to Charlie: Meeting the Challenge of Self Marketing and Personal Branding. *Journal of Marketing Management*, *21*, 589–606.

United States Department of Labor. (2018). Retrieved January 7, 2018, from <https://www.bls.gov/news.release/empsit.nr0.htm>

Wood, A. M., Linley, P. A., Maltby, J., Baliousis, M., & Joseph, S. (2008). The Authentic Personality: A Theoretical and Empirical Conceptualization and the Development of the Authenticity Scale. *Journal of Counseling Psychology*, *55*, 385–399.

Escalation of Commitment in New Product Evaluation: The Moderating Roles of Goal Gradient and Subgoal Effect

Liang, Beichen
Department of Management and Marketing
College of Business and Technology
East Tennessee State University
308 Sam-Wilson Hall | PO Box 70625
Johnson City, TN 37614
liangb@etsu.edu
423.439.6985

Key words: escalation of commitment, new product development, goal gradient effect, goal completion effect, subgoal

Introduction

New product development (NPD) is very risky and highly subject to the problem of escalation of commitment (Schmidt and Calantone 2002) which is defined as persisting in a course of action in the face of negative feedback (Barton, Duchon, and Dunegan, 1989; Staw, 1997; Staw and Ross, 1987). In order to reduce the disastrous effect of escalation of commitment, scholars argue that setting a stopping rule (e.g., a minimum target level) (Boulding, Morgan, and Staelin 1997; Brockner, Shaw, and Rubin 1979; Heath 1995; Simonson and Staw 1992) or using new decision makers at the time of go/no go decision can reduce the likelihood of escalation of commitment effectively (Boulding, Morgan, and Staelin 1997).

However, setting a stopping rule may create a subgoal for decision makers. As a result, they will face multi-goals: ultimate goals such as sales, market share, and / or profit margin, and a subgoal (the stopping rule). Decision makers have difficulty to attain multigoals and are more likely to focus on only one goal that that are attainable (Bandura 1997; Shah and Higgins 1997; Ordóñez et al, 2009; Shah, Friedman, and Kruglanski 2002), especially when the ultimate goal is very challenging. Moreover, both goal gradient effect (Hull 1932; 1934) and project completion effect (Boehne and Paese 2000; Conlon and Garland 1993; Garland and Conlon 1998; He and Mittal 2007; Kei, Truex, and Mixon 1995) suggest that people increase their efforts when goal is proximal. Therefore, scholars have ignored a possibility that creating a stopping rule actually may motivate decision makers to continue a failing project when the negative feedback is close to it. Therefore, this paper investigates how decision makers evaluate a failing new product when they are given an additional stopping rule and when the negative feedback is close to the stopping rule.

Literature Overview

Goal and Subgoal

Human activities are goal-driven (Amir and Ariely 2008; Kruglanski et al. 2002). People are always guided by personal or organizational goals (Kernan and Lord 1989). Some goals are difficult or are pursued over a long period of time (Gal and Mcshane 2012), therefore people always break down a long-term or difficult and challenging goal into short-term or smaller and more manageable goals (Anzai and Simon 1979; Brendl and Higgins 1996; Newell and Simon 1972; Vancouver, Weinhardt, and Schmidt 2010). As a result, sub-goals are widely used in everyday lives of people (Jin, Xu, and Zhang 2015). Although people may have many ongoing goals simultaneously, but they can focus on only one (Vallacher and Wegner 1987; Vancouver, Weinhardt and Schmidt 2010) because goal pursuit is based on limited psychological (e.g. attention, Kruglanski et al. 2002) and physical resources (e.g., time and energy, Vancouver, Weinhardt, and Schmidt 2010). When individuals pursue multi goals simultaneously, they are more likely to focus on only one goal and ignore others and pursue goals that are attainable (Bandura 1997; Gilliland and Landis 1992; Ordóñez et al, 2009; Shah, Friedman, and Kruglanski 2002; Shah and Higgins 1997).

Goal Gradient Effect

The goal-gradient hypothesis that was originally proposed by Hull in 1932 states that organisms increase their efforts when goal is proximal. Goal gradient effect have been confirmed with animals, especially rats, by using multiple measures such as time, speed, or strength of pull (e.g., Anderson 1933; Brown 1948; Elder et al. 1970. Elder, Kuehne, and Moriarty Jr. 1970; Hull 1932, 1934; Meade, Robert D., and Philip J. Newman 1962) and with humans, especially students (e.g., Bandura and Schunk 1981; Fenz and Epstein 1967; Förster, Higgins, and Idson 1998; Gjesme 1974; Losco and Epstein 1977). project completion effect which is similar to the goal gradient effect has been tested in escalation of commitment (e.g., Boehne and Paese 2000; Conlon and Garland 1993; Garland and Conlon 1998; He and Mittal 2007; Kei, Truex, and Mixon 1995). Scholars found that the decision makers' desire to continue the project is stronger as the project is closer to completion.

Methodology

The study is based on a 2x2 between subject factorial design (2 levels of responsibility, yes or no; 2 levels of stopping rules, yes or no). 83 students from a South-Eastern public university participated in the study. The stimuli was adapted from that used by Boulding, Morgan, and Staelin (1997) and Bialogorsky, Boulding, and Staelin (2006). Subjects were asked to work on the Quality Valve Company (QVC) Case. QVC makes emission valves for the automobile industry. The cases briefly described the history of the company, the primary competitor (Great Lake Valve Company), and the market. ANOVA, Chi-Square test, and logistic regression were used to analyze the data.

Results and Implications

The findings suggest that setting a stopping rule and when the negative feedback is close to it can make decision makers perceive a negative feedback as less negative and believe that the goal is

more attainable. As a result, they are more likely to continue a failing new product. Moreover, setting a stopping rule have a significant moderating impact on the go/no-go decision of non-responsible decision makers. They are more likely to continue the failing new product when there is a stopping rule than when there is no stopping rule. However, setting a stopping rule has no impact on the go/no-go decision of responsible decision makers although it makes them perceive the negative feedback as less negative. Moreover, the main drivers of escalation decision are not responsibility nor stopping rule, but decision makers' perception that the negative feedback is not very negative and belief that the subgoal is attainable.

Conclusion

This study also has a few limitations. First, it is based a lab experiment which may be quite different from a real escalation decision. Second, although this study finds that decision makers would persist in a failing course of action when the negative feedback is very close to the stopping rule, it does not investigate how close is close. Future research should investigate the effect of degree of closeness on escalation of commitment.

References

- Amir, O., & Ariely, D. (2008). Resting on laurels: the effects of discrete progress markers as subgoals on task performance and preferences. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 34(5), 1158-1171.
- Anderson, A. C. (1933). Runway time and the goal gradient. *Journal of Experimental Psychology*, 16(3), 423-428.
- Anzai, Y., & Simon, H. A. (1979). The theory of learning by doing. *Psychological Review*, 86(2), 124-140.
- Barton, S. L., Duchon, D., & Dunegan, K. J. (1989). An empirical test of Staw and Ross's prescription for the management of escalation of commitment behavior in organizations. *Decision Sciences*, 20 (3), 532-44.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. Macmillan.
- Bandura, A., & Schunk, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology*, 41(3), 586-598.
- Biyalogorsky, E., Boulding, W., & Staelin, R. (2006). Stuck in the past: why managers persist with new product failure. *Journal of Marketing*, 70 (2), 108-121.
- Boehne, D. M., & Paese, P. W. (2000). Deciding whether to complete or terminate an unfinished project: A strong test of the project completion hypothesis. *Organizational Behavior and Human Decision Processes*, 81(2), 178-194.

- Boulding, W., Morgan, R., & Staelin, R. (1997). Pulling the plug to stop the new product drain. *Journal of Marketing Research*, 34 (1), 164-176.
- Brendl, C. M., & Higgins, E. T. (1996). Principles of judging valence: What makes events positive or negative? *Advances in Experimental Social Psychology*, 28, 95-160.
- Brockner, J., Shaw, M. C., & Rubin, J. Z. (1979). Factors affecting withdrawal from an escalating conflict: Quitting before it's too late. *Journal of Experimental Social Psychology*, 15(5), 492-503.
- Brown, J. S. (1948). Gradients of approach and avoidance responses and their relation to level of motivation. *Journal of Comparative and Physiological Psychology*, 41(6), 450-465.
- Conlon, D. E., & Garland, H. (1993). The role of project completion information in resource allocation decisions. *Academy of Management Journal*, 36(2), 402-413.
- Elder, S. T., Kuehne, T. E., Clark, N., & Larre, E. E. (1970). Approach-avoidance conflict: I. Empirically determined speed-of-locomotion approach gradients. *Psychological Reports*, 27(2), 623-628.
- Elder, S. T., Kuehne, T. E., & Moriarty Jr, D. D. (1970). Approach-avoidance conflict: II. Role of olfactory cues. *Psychological Reports*, 27(2), 631-638.
- Fenz, W. D., & Epstein, S. (1967). Gradients of physiological arousal in parachutists as a function of an approaching jump. *Psychosomatic medicine*, 29(1), 33-51.
- Gal, D., & McShane, B. B. (2012). Can small victories help win the war? Evidence from consumer debt management. *Journal of Marketing Research*, (0), 487-501.
- Garland, H., & Conlon, D. E. (1998). Too close to quit: The role of project completion in maintaining commitment. *Journal of Applied Social Psychology*, 28(22), 2025-2048.
- Gilliand, S. W. and R. S. Landis (1992), "Quality and Quantity Goals in a Complex Decision Task: Strategies and Outcomes," *Journal of Applied Psychology*, 77 (5), 672-681.
- Gjesme, T. (1974). Goal distance in time and its effects on the relations between achievement motives and performance. *Journal of Research in Personality*, 8(2), 161-171.
- He, X., & Mittal, V. (2007). The effect of decision risk and project stage on escalation of commitment. *Organizational Behavior and Human Decision Processes*, 103(2), 225-237.
- Health, C. (1995). Escalation and de-escalation of commitment in response to sunk costs: the role of budgeting in mental accounting. *Organizational Behavior and Human Decision Processes*, 62 (1), 38-54.
- Hull, C. L. (1932). The goal-gradient hypothesis and maze learning. *Psychological Review*, 39(1), 25-43.

Hull, C. L. (1934). The rat's speed-of-locomotion gradient in the approach to food. *Journal of comparative psychology*, 17(3), 393.

Jin, L., Xu, Q., & Zhang, Y. (2015). Climbing the Wrong Ladder: The Mismatch Between Consumers' Preference for Subgoal Sequences and Actual Goal Performance. *Journal of Marketing Research*, 52(5), 616-628.

Keil, M., Truex, D. P., & Mixon, R. (1995). The effects of sunk cost and project completion on information technology project escalation. *IEEE Transactions on Engineering Management*, 42(4), 372-381.

Kernan, M. C., & Lord, R. G. (1989). The effects of explicit goals and specific feedback on escalation processes. *Journal of Applied Social Psychology*, 19(13), 1125-1143.

Förster, J., Higgins, E. T., & Idson, L. C. (1998). Approach and avoidance strength during goal attainment: Regulatory focus and the "goal looms larger" effect. *Journal of Personality and Social Psychology*, 75(5), 1115-1131.

Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Chun, W. Y., & Sleeth-Keppler, D. (2002). A theory of goal systems. *Advances in experimental social psychology*, 34, 331-378.

Losco, J., & Epstein, S. (1977). Relative steepness of approach and avoidance gradients as a function of magnitude and valence of incentive. *Journal of Abnormal Psychology*, 86(4), 360-368.

Meade, R. D., & Newman, P. J. (1962). Terminal retardation in activity gradients. *Journal of Comparative and Physiological Psychology*, 55(6), 1065-1068.

Newell, A., & Simon, H. A. (1972). *Human problem solving* (Vol. 104, No. 9). Englewood Cliffs, NJ: Prentice-Hall.

Ordóñez, L. D., Schweitzer, M. E., Galinsky, A. D., & Bazerman, M. H. (2009). Goals gone wild: The systematic side effects of overprescribing goal setting. *The Academy of Management Perspectives*, 23(1), 6-16.

Schmidt, J. B., & Calantone, R. J. (2002). Escalation of commitment during new product development. *Journal of the academy of marketing science*, 30(2), 103-118.

Shah, J. Y., Friedman, R., & Kruglanski, A. W. (2002). Forgetting all else: On the antecedents and consequences of goal shielding. *Journal of Personality and Social Psychology*, 83(6), 1261-1280.

Shah, J., & Higgins, E. T. (1997). Expectancy× value effects: Regulatory focus as determinant of magnitude and direction. *Journal of personality and social psychology*, 73(3), 447.

Simonson, I., & Staw, B. M. (1992). Deescalation strategies: A comparison of techniques for reducing commitment to losing courses of action. *Journal of applied psychology*, 77(4), 419-426.

Staw, B. M. (1997). The escalation of commitment: An update and appraisal. *Organizational Decision Making*, 191-215.

Staw, B. M., & Ross, J. (1978). Commitment to a policy decision: A multi-theoretical perspective. *Administrative Science Quarterly*, 40-64.

Vallacher, R. R., & Wegner, D. M. (1987). What do people think they're doing? Action identification and human behavior. *Psychological review*, 94(1), 3.

Vancouver, J. B., Weinhardt, J. M., & Schmidt, A. M. (2010). A formal, computational theory of multiple-goal pursuit: integrating goal-choice and goal-striving processes. *Journal of Applied Psychology*, 95(6), 985-1008.

Ethical Hacking: Cybersecurity Education for the 21st Century

Medlin, B. Dawn
Department of Computer Information Systems
and Supply Chain Management
Appalachian State University
2114 Peacock Hall
Boone, NC 28608
medlinbd@appstate.edu
828.262.2411

Hartley, Regina D.
Department of Computer Information Systems
and Supply Chain Management
Appalachian State University
2114 Peacock Hall
Boone, NC 28608
hartleyrd@appstate.edu
828.262.7447 (Contact Author)

Key words: Ethical hacking, ethical hacking education, information security instruction, ethical hacking pedagogy.

Introduction

The dependence on information technologies and technological infrastructures continues to infiltrate all of the society. It may be reasoned that some concern stems from the apparent lack of security inherent in information technologies and systems. Of particular importance is our growing reliance on the Internet and networking capabilities. The Internet has provided massive opportunities in a wide range of areas not possible in prior years, but it has also required that individuals be educated on topics related to this growth.

While there are positive aspects provided by the Internet and the networking of global devices, unpleasant consequences of such usage have also produced unexpected results such as ransomware and DDoS attacks, as well as other highly politicized and publicized hacks. While numerous crimes have existed for many years, the Internet and information technologies have transformed computer crime in unthinkable ways. As such, criminals have a new platform for conducting activities, and many individuals are so disconcerted at the subsequent onslaught from these endeavors that in many cases only reactive measures are implemented.

The primary purpose of this paper is to analyze the use of an ethical hacking pedagogical approach to improve information security education for the 21st century student. A hacking methodology

appears to be a more offensive and proactive approach for information security instruction. This approach may be more effective to prepare future cybersecurity professionals when faced with unethical hacker intrusions associated with the Internet and computer networks. Cybersecurity professionals would be better prepared to combat intrusions if equipped with the knowledge and skill sets currently used by attackers. In order to provide information security professionals, students must be prepared to fight the ever-growing challenges associated with effectively securing computer networks.

Literature review

In light of the need for more proactive measures relating to the education of future security professionals in the 21st century, attention will briefly focus on the history of hacking. Hacking began for the most part in the 1960s and originated on the campuses of Massachusetts Institute of Technology (MIT) and Stanford University. At that time, the word "hack" referred to programming shortcuts and was considered a better way to complete anything more efficiently. These original "old school hackers" were not interested in malicious intent, but rather simply enjoyed technology (Slatalla, 2005).

A hacker may be defined as a "person who enjoys learning the details of computer systems and how to stretch their capabilities" (Ethical hacking: Student courseware, 2005, p. 11). Originally hackers, or enthusiasts, were people who were merely curious and passionate about whatever technology was new at the time (Oriyano, 2014).

Through the passage of time hackers have lost their romantic appeal to the public as the Internet has evolved and become more widely utilized (Slatalla, 2005). Though newer groups are emerging with the title of "suicide hackers," older categories and titles have remained such as "script kiddies and coders." The new suicide hackers are known as individuals who attack to prove a point, but unlike "hacktivists" they do not cover their tracks and are not concerned if they get caught (Oriyano, 2014).

Ethical Hacking

Along with the effectiveness of using an ethical hacking approach to instruct future cybersecurity professionals, this research also examines definitions associated with this methodology. Based on a review of the literature, there appear to be two primary schools of thought concerning computer security instruction. One method focuses on the instruction of the theoretical concepts alone, and the other includes a hands-on laboratory component to reinforce the theoretical concepts. One approach that appears to be effective in computer security instruction is that of ethical hacking.

Some institutions of higher education define ethical hacking as a somewhat "controversial act" of examining and investigating computers and information systems to ascertain potential vulnerabilities. That process is typically followed by duplicating the activities and intentions of "malicious hackers" (Jaskolka, 2009). Ethical hacking may also be defined as red teaming, intrusion testing, and penetration testing (Jaskolka, 2009).

Ethical hacking may also be defined as a methodology for assisting computer professionals and administrators in their efforts to secure networks. As such, this topic will be reviewed in light of

its effectiveness for instructing proactive offensive measures to students in information security courses.

The basic assumption is that ethical hacking is basically a different approach to cybersecurity. Ethical hacking is primarily penetration testing and includes penetrating the “system like a hacker but for benign purposes” (Oriyano, 2014, p. 10). It is felt by many researchers, that students need to experience firsthand what the attacker will be doing and what tools will be used (Ethical Hacking: Student courseware, 2005, p. 12).

Ethical hacking may also be defined as the “methodology adopted by ethical hackers to discover the vulnerabilities existing in information systems’ operating environments” (Ethical Hacking: Student courseware, 2005). Lastly, ethical hacking may be defined as an individual with the same skill sets as the attacker, but differs in the fact that permission has been granted to test the system of the target (Oriyano, 2014).

Greene (2004) states that “Ethical hackers and malicious hackers” do essentially the same activities, “only their intent differs.” Pashel (2006) suggests, “Ethical hacking can be defined as the practice of hacking without malicious intent” (p. 198).

Ethical hacking or penetration testing is similar in concept to hiring external auditors. Activities are conducted to identify and exploit security vulnerabilities thereby providing organizations and businesses with the necessary information to implement corrective measures (Sheoran, P., & Singh, S. 2014). Logan and Clarkson (2005) also suggest “Just as auditors test systems for security or operational flaws, hackers ‘test’ systems through attack” (Logan, & Clarkson, 2005, p. 157).

As stated earlier in the discussion, there appear to be two primary approaches in information security instruction. One addresses theoretical concepts only, while the other utilizes the concepts with a hands-on component. Trabelsi and McCoe (2016) feel strongly that covering only “theoretical aspects of information security may not prepare students for overcoming the difficulties associated with the efficient protection of complex computer systems and information assets” (p. 1). They further maintain that students must have an opportunity to be engaged with security technologies in order to acquire the knowledge and skillset that is needed to be successful in the field of computer security.

Ethical Hacking Education

With the conclusion of the definition of ethical hacking, the research will offer an overview of ethical hacking education to train 21st century students. Teaching students how to hack ethically may be seen as a worthy responsibility, and most researchers agree that it is critical for security professionals. Pashel (2006) proposes that the ability to determine weaknesses in computer systems can assist security professionals in preventing attacks. He goes on to offer that ethical hacking may be deemed a crucial element in a security program (Pashel, 2006).

The skills used in ethical hacking may be considered as more proactive rather than reactive in nature. Security educators feel that teaching “offensive methods” produces better prepared security professionals than teaching “defensive techniques” (Trabelsi, 2011).

Many researchers and educators maintain that practicing ethical hacking skills are crucial in developing necessary skill sets for computer security professionals. Trabelsi (2011) states that students should receive instruction to prepare them for robust research and development in their career. He goes on to insist there is a critical need and demand for first-hand experience to assist in the design and construction of defenses to combat attacks (Trabelsi, 2011).

In another study, Trabelsi (2012) argues that by not providing information and knowledge ascertained from hacking, computer security professionals are not adequately being prepared for their careers. He goes on to suggest that teaching attacks are considered a necessary element of security education. Finally, Trabelsi and Alketbi (2013) state that techniques of ethical hacking should be included in a curriculum to better prepare security professionals.

Best Practices in Ethical Hacking Education

With the conclusion of the definition of ethical hacking education, the emphasis will be placed upon the best practices currently being offered to prepare future security professionals in the 21st century. As shown in the literature, some of the best practices also emphasize a hands-on approach.

The program of study for teaching ethical hacking techniques should adequately prepare students for a career in security. Trabelsi (2014) states that “a security education curriculum that does not give the students the opportunity to experiment in practice with security techniques,” could potentially cause students to be inadequately prepared for a future career (p. 39). He goes on to offer that students need to have the skills to feel confident in their ability to combat an attacker. In another study, Trabelsi and McCoey (2016) found that if students have not had the opportunity to investigate “real hacking” they might be inadequately prepared to prevent future attacks.

A number of researchers go on to propose that students need to be able to identify an attacker and have a similar mindset when combating them. As a result, it is argued that educators shift from a traditional approach to an “attacker’s way of thinking” (Bratus, Shubina, & Locasto, 2010). They go on to offer that educational offerings should address both a “defender” and “attacker” perspective.

Other researchers agree that preparing students to understand the mindset of attackers better prepares them to adequately secure a network as well as web applications in general. Saleem (2006) suggests that computer students should be prepared with ethical hacking techniques to be able to fight attackers. Wu (2014) goes on to propose the importance of having a hacker mindset and actions of an “ethical hacker,” which is a critical skill for a successful career in security for web applications.

The research concerning best practices suggests that ethical hacking preparation is best accomplished with a hands-on approach. Logan and Clarkson (2005) maintain that receiving training in ethical hacking should be guided with a “hands-on” approach. The scholars go on to offer that a “book and lecture-based instruction is not always as effective in demonstrating concepts as hands-on experience” (Logan & Clarkson, 2005, p. 158).

Other researchers also agree with the necessity of having a hands-on approach in teaching security concepts to future security professionals. Weiss and Mache (2011) argue that there should be

“hands-on security in all core classes.” Trabelsi (2011) offers that a security curriculum with only theoretical components is not nearly as effective as a hands-on approach. He further suggests that students need experience and practice to contribute to “research and development” in the field of computer security (Trabelsi, 2011).

When students were anonymously surveyed concerning the hands-on lab instruction, 85% felt that the applications were useful and helped them to understand the theoretical concepts in the class. Moreover, 87% of the students indicated that they would like further hands-on lab instruction, and 86% felt they would recommend the lab activities to others (Trabelsi, & McCoey, 2016).

Upon the conclusion of the review of best practices in the instruction of ethical hacking, it must be noted that most educators agree that the pros outweigh the cons. Trabelisi offers that the ethical concerns relating to teaching hacking are small compared to the benefits realized for students (Trabelsi, 2011, 2012, 2013, 2014).

Conclusion

Information technologies and networking infiltrate all aspects of our lives and society. Security issues relating to attackers and intruders are demanding that many security professionals examine and explore more proactive approaches to security networks. Educating students by utilizing practices and knowledge of ethical hacking can assist them with the skills necessary to create and implement specific security procedures and policies. Future information security professionals will need to be equipped with skill sets and mindsets currently used by attackers in order to actively protect networks from intruders. Technical expertise is necessary to implement the details of security procedures that will include both a defensive and offensive action. Ethical hacking is proving to be a very successful methodology to prepare students for careers in information security in the 21st century.

References

Bratus, S., Shubina, A., & Locasto, M. (2010). Teaching the principles of the hacker curriculum to undergraduates. Proceedings of the 41st ACM Technical Symposium on Computer Science Education – SIGCSE '10.

Ethical Hacking: Student courseware. Ec-Council. (2005, March). Retrieved from www.eccouncil.org.

Greene, T (2004, July 22). Training ethical hackers: Training the enemy? Retrieved December 10, 2015.

Jaskolka, J. (2009, April 7). Ethical Hacking. Retrieved June 8, 2017.

Logan, P., & Clarkson, A. (2005). Teaching students to hack. SIGCSE Bull. ACM SIGCSE Bulletin, 157-157.

Oriyano, S. (2014). CEHv8 Certified Ethical Hacker version 8: Study guide. Indianapolis: Sybex.

Pashel, B. A. (2006). Teaching students to hack. Proceedings of the 3rd Annual Conference on Information Security Curriculum Development - InfoSecCD '06.

Saleem, S. A. (2006). Ethical hacking as a risk management technique. Proceedings of the 3rd Annual Conference on Information Security Curriculum Development – InfoSecCD '06.

Sheoran, P., & Singh, S. (2014). Applications of Ethical Hacking. International Journal of Enhanced Research in Science Technology & Engineering, 3(5), 112-114.

Slatalla, M. A brief history of hacking. Retrieved November 5, 2005.

Trabelsi, Z. (2011). Hands-on lab exercises implementation of DoS and MiM attacks using ARP cache poisoning. Proceedings of the 2011 Information Security Curriculum Development Conference on - InfoSecCD '11.

Trabelsi, Z. (2012). Switch's CAM table poisoning attack: Hands-on lab exercises for network security education. Proceedings of the Fourteenth Australasian Computing Education Conference (ACE2012), Melbourne, Australia.

Trabelsi, Z., & Alketbi, L. (2013). Using network packet generators and snort rules for teaching denial of service attacks. Proceedings of the 18th ACM conference on Innovation and technology in computer science education - ITiCSE '13.

Trabelsi, Z. (2014). Enhancing the comprehension of network sniffing attack in information security education using a hands-on lab approach. Proceedings of the 15th Annual Conference on Information Technology Education – SIGITE '14.

Trabelsi, Z., & McCoey, M. (2016). Ethical hacking in Information Security curricula. International Journal of Information and Communication Technology Education, 12(1), 1-10.

Weiss, R., & Mache, J. (2011). Teaching security labs with web applications, buffer overflows, and firewall configurations. Journal of Computing Sciences in Colleges, 27(1), pp163-170.

Wu, A. (2014). Project development for ethical hacking practice in a website security course. Proceedings of the Western Canadian Conference on Computing Education – WCCCE '14.

Full Range Focus: How Regulatory Focus Influences the Relationship between Leader Behavior and Subordinate Outcomes

Gorman, C. Allen
Department of Management and Marketing
College of Business and Technology
East Tennessee State University
128 Sam Wilson Hall | PO Box 70625
Johnson City, TN 37614
gormanc@etsu.edu
423.439.5592

Chavez Reyes, Denise
Department of Management and Marketing
College of Business and Technology
East Tennessee State University
PO Box 70625
Johnson City, TN 37614
chavezd@etsu.edu
423.439.4422

Key words: transformational leadership, transactional leadership, regulatory focus, organizational citizenship behavior, counterproductive work behavior

Introduction

Research on leadership and subsequent follower outcomes has remained a prominent topic of study in the organizational sciences. Another determinant of work outcomes is a follower's regulatory focus. Research examining the motivational construct of regulatory focus suggests it is an important predictor for outcomes including task and contextual performance (Lockwood et al., 2002; Neubert et al., 2008). The current study explores these variables simultaneously to illustrate how both leader and follower characteristics influence organizational citizenship behavior (OCB) and counterproductive work behavior (CWB).

Literature Overview

Transformational and Transactional Leadership

Leaders who are rated as more transformational have been shown to impact many outcomes of interest, including OCB (Purvanova et al., 2006; Whitford & Moss, 2009). One potential reason transformational leadership has been suggested to relate to increased OCB is that this specific leadership style can inspire followers to exhibit more than the official duties of their job, or go

“above and beyond the call of duty” (Bass & Avolio, 1994; Gardner & Avolio, 1998; Podsakoff et al., 1996).

Hypothesis 1: Transformational leadership will be positively related to OCB.

Transactional leaders are, in contrast, expected to respond negatively to any type of error or deviation from what is expected, by implementing and enforcing policies as well reprimanding individuals who engage in CWB (Kark & Van Dijk, 2007). As leaders who exhibit a high level of transactional leadership will come to be expected by followers to ‘be on the lookout’ for such behavior, it is expected that more transactional leaders will have followers with lower levels of CWB.

Hypothesis 2: Transactional leadership will be negatively related to CWB.

Regulatory Focus

Leaders can influence follower motivation by arousing the different regulatory foci of followers (Kark & Van Dijk, 2007). Because OCB are intended to help the target of the behavior (e.g., individuals, institutions), it is likely that this desire to improve one’s surroundings causes increased OCB performance (Gorman et al., 2012; Organ, 1988).

Hypothesis 3: Promotion focus will be positively related to OCB.

CWB are behaviors not sanctioned by the organization and, if discovered, may result in punishment or public failure or loss; thus, individuals high in prevention focus may be less likely to partake in these activities (Neubert et al., 2008). Indeed, Lanaj and colleagues (2012) found a negative relationship between prevention focus and CWB, and Neubert et al. (2008) found a negative relationship between prevention focus and deviant work behavior.

Hypothesis 4: Follower prevention focus will be negatively related to CWB.

Brockner and Higgins (2001) suggested that leaders can activate followers’ promotion focus through the use of rhetoric focused on ideals and aspirations, which suggests that transformational leadership may naturally engage promotion-focused followers. Here, we expect that transformational leadership will be positively related to promotion focus.

Hypothesis 5: Transformational leadership will be positively related to follower promotion focus.

Leaders who instill respect and trust and inspire personal growth in their followers are likely to engender promotion-oriented behaviors at work, such as helping coworkers (Podsakoff et al., 2000). In addition, individuals with a promotion focus are more likely to attend to positive messages as well as to perform OCB. Thus, it is likely that this dimension of regulatory focus will mediate the previously-studied relationship between transformational leadership and OCB.

Hypothesis 6: Promotion focus will mediate the transformational leadership-OCB relationship.

Given that many of the core behaviors of transactional leadership are punitive in nature (e.g., management-by-exception active/passive), or focused more on attaining or losing tangible rewards (e.g., contingent reward), transactional leadership is expected to encourage individuals not to make mistakes (Bass & Avolio, 1994; Yukl, 2013), and to foster a preoccupation in followers with security needs, obligations, and avoidance of failure (Kark & Van Dijk, 2007).

Hypothesis 7: Transactional leadership will be positively related to prevention focus.

Individuals with a prevention focus are more likely to focus on negative events and information, making them more likely to attempt to avoid the retaliation that could stem from deviant behavior. Transactional leadership is also more likely to prompt a prevention focus among followers and, thus, elicit greater sensitivity to negative outcomes among followers (Kark & Van Dijk, 2007).

Hypothesis 8: Prevention focus will mediate the transactional leadership-CWB relationship.

Methodology

Participants and Procedure

Participants worked in a variety of occupations, including food service, retail, and financial services. The mean age of participants was 24.44 years ($SD = 6.62$) and the sample was 62.3% male. Participants' supervisors were 54.00% male and an average of 40.10 ($SD = 12.85$) years old. Data were collected in 3 waves from 426 matched pairs of employed individuals recruited from graduate and undergraduate business courses at a southeastern U. S. university and their work supervisors. Employees rated their supervisors on transformational and transactional leadership and provided self-reports of promotion and prevention focus. Supervisors provided subordinate ratings of OCB and CWB.

Measures

Multifactor Leadership Questionnaire. The 45-item Multifactor Leadership Questionnaire (MLQ-5X; Avolio & Bass, 2004) was used to measure transformational and transactional leadership.

Regulatory Focus. The Work Regulatory Focus Scale (WRFS; Neubert et al., 2008) is an 18-item scale that we used to measure promotion (9 items) and prevention focus (9 items).

Organizational Citizenship Behavior. OCB directed at the organization was measured using the 7-item scale developed by Williams and Anderson (1991).

Counterproductive Work Behavior. The organizational deviance subscale of Bennett and Robinson's (2000) Workplace Deviance Scale was used to measure CWB.

Analytical Approach. Structural equation modeling (SEM) in Mplus 6.12 (Muthén & Muthén, 1998-2010) was used to test the proposed model. Item parceling was used to reduce model

complexity (Little et al., 2002). Results indicate that the measurement model provided a very good fit to the data ($\chi^2[173] = 331.215$, RMSEA = .046, CFI = .969, NNFI = .963).

Results

Table 1 includes means, standard deviations, and correlations among study variables. A partially-mediated model ($\chi^2[179] = 332.714$, $p < .001$; RMSEA = .045, CFI = .970, NNFI = .965) provided acceptable fit to the data. However, the fully-mediated model also provided an adequate fit to the data ($\chi^2[181] = 334.679$, $p < .001$; RMSEA = .045; CFI = .970; NNFI = .965), and there was no significant difference in fit ($\Delta\chi^2[2] = 1.965$, $p = .374$). As such, the fully-mediated model is preferred as it is more parsimonious (see Figure 1 for the mediated model).

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. OCB	6.05	.84	(.75)					
2. CWB	1.23	.61	-.44**	(.93)				
3. Promotion Focus	3.90	.54	.05	-.07	(.81)			
4. Prevention Focus	4.12	.51	.16**	-.16**	.34**	(.82)		
5. Transformational Leadership	3.48	.81	.06	-.11*	.24**	.12*	(.94)	
6. Transactional Leadership	3.00	.50	-.06	-.11*	.17**	.17**	.48**	(.72)

Note. ** Significant at $p < .01$. * Significant at $p < .05$.

Table 1: Means, standard deviations, and zero-order correlations among study variables

To test the direct effects in Hypothesis 1 and Hypothesis 2, parameter estimates were examined in a direct effects model. All other effects were estimated using the fully mediated model. Mediation hypotheses were tested using bootstrapping. Transformational leadership was not significantly related to OCB ($\gamma = -.05$, $p > .05$), but transactional leadership was significantly related to CWB ($\gamma = -.15$, $p < .01$), thus failing to support Hypothesis 1 but supporting Hypothesis 2. Promotion focus was not positively related to OCB ($\gamma = -.05$, $p > .05$), failing to support Hypothesis 3. However, prevention focus was negatively related to CWB ($\gamma = -.19$, $p < .05$), providing support for Hypothesis 4. Transformational leadership was significantly, positively related to promotion

focus ($\gamma = .26, p < .05$), supporting Hypothesis 5. Transformational leadership did not have a significant indirect effect on OCB through promotion focus ($Z = -.013, p > .05$), failing to supporting Hypothesis 6. Transactional leadership was significantly, positively related to prevention focus ($\gamma = .20, p < .05$), supporting Hypothesis 7. Finally, the indirect effect from transactional leadership on CWB through prevention focus was negative and significant ($Z = -.037, p < .05$), in support of Hypothesis 8.

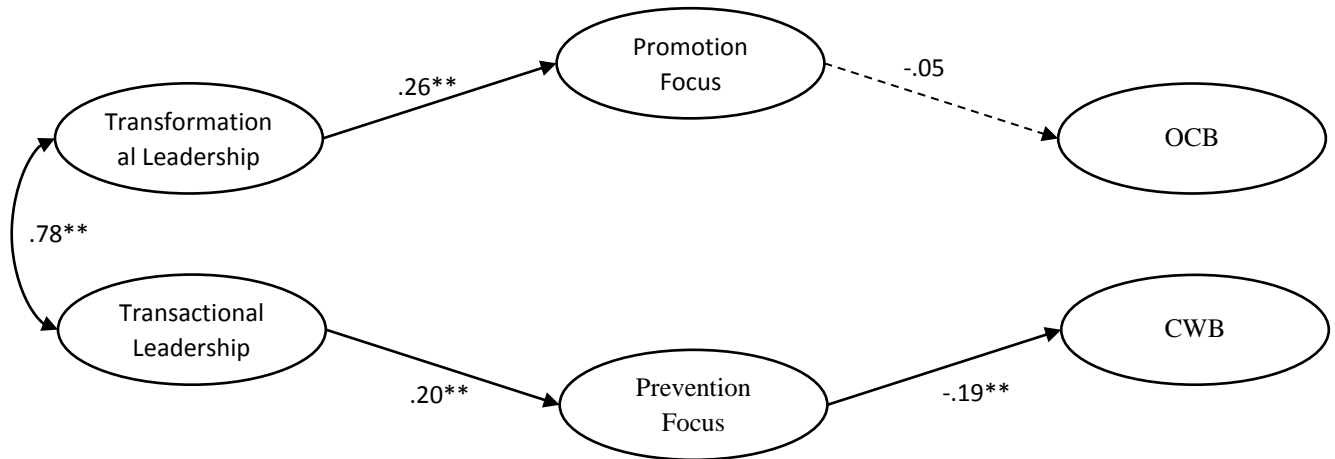


Figure 1: Hypothesized model with standardized path coefficients. ** Significant at $p < .01$.

Conclusion

The present study's findings advance both regulatory focus theory and leadership theory by investigating how regulatory focus mediates the relationships between leader behavior and follower outcomes. Results of this study offer the new perspective that prevention focus fully mediates the relationship between transactional leadership and CWB. Contrary to expectations, results did not support a promotion focus-mediated relationship between transformational leadership and OCB. Our findings suggest that if leaders rely on transactional behaviors to influence followers, this could result in a climate where followers are fearful of making mistakes and being reprimanded, therein decreasing CWB, but also not necessarily facilitating other positive behaviors such as OCB.

References

- Avolio, B.J., & Bass, B.M. (2004). *Multifactor leadership questionnaire* (3rd ed.). Mind Garden.
- Bass, B. M., & Avolio, B. J. (1994). *Improving organizational effectiveness through transformational leadership*. Thousand Oaks, CA: Sage.

- Bennett, R. J., & Robinson, S. L. (2003). The past, present, and future of workplace deviance research. In J. Greenberg (Ed.), *Organizational Behavior: The State of Science* (2nd ed., pp. 247-281). Mahwah, NJ: Erlbaum.
- Brockner, J., & Higgins, E. T. (2001). Regulatory focus theory: Implications for the study of emotions at work. *Organizational Behavior and Human Decision Processes*, *86*, 35– 66.
- Gardner, W. L., & Avolio, B. J. (1998). The charismatic relationship: A dramaturgical perspective. *Academy of Management Review*, *23*, 31–58.
- Gorman, C. A., Meriac, J. P., Overstreet, B. L., Apodaca, S., McIntyre, A. L., Park, P., & Godbey, J. N. (2012). A meta-analysis of the regulatory focus nomological network: work-related antecedents and consequences. *Journal of Vocational Behavior*, *80*, 160-172.
- Kark, R., & Van Dijk, D. (2007). Motivation to lead, motivation to follow: The role of the self-regulatory focus in leadership processes. *Academy of Management Review*, *32*, 500-528.
- Lanaj, K., Chang, C., & Johnson, R. E. (2012). Regulatory focus and work-related outcomes: A review and meta-analysis. *Psychological Bulletin*, *138*, 998–1034.
- Lockwood, P., Jordan, C. H., & Kunda, Z. (2002). Motivation by positive or negative role models: regulatory focus determines who will best inspire us. *Journal of Personality and Social Psychology*, *83*, 854-864.
- Little, T. D., Cunningham, W.A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling*, *9*, 151-173.
- Muthén, L. K., & Muthén, B. O. (1998-2010). *Mplus user's guide. Sixth edition*. Los Angeles, CA: Muthén & Muthén.
- Neubert, M. J., Carlson, D. S., Kacman, K. M., Chonko, L. B., & Roberts, J. A. (2008). Regulatory focus as a mediator of the influence of initiating structure and servant leadership on employee behavior. *Journal of Applied Psychology*, *93*, 1220-1233.
- Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome*. Lexington, MA: Lexington Books.
- Podsakoff, P. M., MacKenzie, S. B., & Bommer, W. H. (1996). Transformational leader behaviors and substitutes for leadership as determinants of employee satisfaction, commitment, trust and organizational citizenship behaviors. *Journal of Management*, *22*, 259–298.
- Podsakoff, P. M., MacKenzie, S. B., Paine, J. B., & Bachrach, D. G. (2000). Organizational citizenship behaviors: A critical review of the theoretical and empirical literature and suggestions for future research. *Journal of Management*, *26*, 513–563.
- Purvanova, R. K., Bono, J. E., & Dzieweczynski, J. (2006). Transformational leadership, job characteristics, and organizational citizenship performance. *Human Performance*, *19*, 1-22.

Whitford, T. & Moss, S. A. (2009). Transformational leadership in distributed work groups: the moderating role of follower regulatory focus and goal orientation. *Communication Research*, 36, 810-837.

Williams, L. J., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of Management*, 17, 601-617.

Yukl, G. (2013), *Leadership in Organizations*, Vol. 8/E, Prentice Hall, Englewood Cliffs, NJ.

Impact of NOL Carryforwards: Subsidizing Startups

Beach, Robert
East Tennessee State University
Department of Economics and Finance
Johnson City, TN 37614
beachr@etsu.edu
(540)-818-3793

Key words: net operating loss, tax carryforwards, subsidies, valuation

Introduction

Carryforward rules for net operating losses (NOLs) allow corporations in the U.S. to use these losses to offset future earnings. This is one reason that effective tax rates are typically less than the top marginal rates. Startup corporations that require rapid growth to be sustainable can go a number of years with net operating losses. These losses can be used to reduce tax obligations in the future. This paper uses data developed in Beach (2017) with respect to losses incurred in the development phase of five recent startups. Under the assumption that from this point on these firms will have positive net income, three things are calculated: (i) the steady state level of earnings to breakeven going forward over a period of ten years; (ii) under the carryforward rules the number of years until the NOLs either expire or are used up and there is taxable income; and (iii) the valuation of the operating losses in terms of the reduction of taxable income.

Most OECD countries have some form of operating loss carryforward rules. These usually allow for carrybacks from one to three years and carry forwards of up to 20 years (see Cooper and Knittle, 2006). In the U.S. losses can be carried back two years and carried forward up to 20 years. However, these parameters are subject to change based on issues related to the performance of the economy. For instance, the carryback period was extended in the wake of the nine-eleven crisis in 2001 and after the financial crises in 2008 (BTA portfolio 593, 2017). In both cases it was extended to five years. This softens the blow to corporations by providing tax refunds and liquidity during a time of crisis (for a discussion of these effects see Graham and Kim, 2009).

Auerbach and Poterba (1987) discuss the impact of NOLs on firm decision making with respect to investment and capital structure. As carryforwards go up, it is argued, investment in assets with longer term depreciation should go up since the reduced depreciation is offset by the carryforwards. Also, capital structure should shift more towards equity since the impact of the tax shield is reduced. Another issue is valuation of the firm's NOLs. One approach to this valuation is to use a collar strategy similar to that used in trading call and put options (see Streitferdt, 2013). Another approach uses a contingent claims approach to estimate future income and a valuation of

the NOL (Sarkar, 2014). More consistent with the approach used here, De Waegenaere et al. (2003) use an estimate of future steady state income as a basis of valuation of NOL.

This paper approaches loss carryforwards from the perspective of a typical technology startup that requires a high growth rate to make it feasible. For these firms there can be a number of years of operating losses during the development phase. These can be carried forward for years into the future. In Beach (2017) I raised the issue of whether or not startups are somehow subsidized by society since it is questionable whether they can be justified from a net present value framework. This I referred to as the implicit startup subsidy. Here it is argued that NOL carryforwards, by reducing future taxes, represents a type of subsidy for these firms.

Model

With one exception the startups under consideration have net operating losses through 2016. The data collected starts from the firm's S-1 report, which includes up to three years of financial data previous to going public with an IPO, and includes the annual reports through 2016. This is the same data set used in Beach (2017) with the addition of the 2016 data. The one exception is Amazon which has already passed through its initial development phase and has had mostly positive earnings since 2002. From this data breakeven net earnings is calculated on the assumption that going forward there is enough positive earnings for the firm to breakeven in ten years. That is, the following is solved for net earnings, NE:

$$10 * NE = - \sum_{t=1}^N NOL_t$$

where year $t=1$ is the first year that financial data is available and year N represents the number of years to 2016.

Given the value of NE for each firm, the NOLs for each year are spread across the years with positive net earnings based on the carry forward rules used in the U.S. From this process the number of years to positive taxable income is calculated. Finally, the present value of the tax savings based on the carryforward rules is calculated. This is referred to as the Current Breakeven Valuation (CBV) and is calculated as:

$$CBV = \sum_{t=1}^N \frac{NE - Carryforward_t}{(1 + wacc)^t}$$

where $wacc$ is the weighted average cost of capital, year $t=1$ is the first year of positive earnings, and year N is the year the accrued NOLs expire.

Results

To illustrate the impact of NOL carryforwards on future taxes five startups are considered. Table 1 lists these corporations, the ticker symbol, the sector, and the first year that financial statement data is available.

Corporation	Ticker	Industry	Data Available
Amazon	AMZN	Specialty Distribution	1994
Tesla	TSLA	Automotive	2008
Keryx	KERX	Pharmaceutical	1994
Groupon	GRPN	Advertising	2008
Intrexon	XON	Biotech	2011

Table 1: Startup corporations considered

The results of the analysis are given in Table 2 which lists each startup, its ticker symbol, total net operating loss, ten year breakeven amount, years until carryforwards are used up and earnings are taxable, and the current breakeven value.

Corporation	Ticker	Total NOL (\$1000)	Breakeven NE (\$1000)	Years to Taxable Earnings	Current Breakeven Value (CBV) (\$1000)
Amazon	AMZN*	2,293,141	NA	8	540,457
Tesla	TSLA	2,875,105	287,511	10	348,867
Keryx	KERX	556,061	55,606	13	206,104
Groupon	GRPN	1,112,514	111,251	9	514,317
Intrexon	XON	589424	58,924	11	298,315

*Amazon net income data and valuation based on actual NOL data from 1994-2001 and net earnings from 2002-2016.

Table 2: breakeven net earnings, years to taxable income, and current breakeven value.

From Table 2, for example, Tesla has total NOLs through 2016 of \$2,875,105 (all dollar values in Table 2 are in \$1,000), ten year breakeven earnings of \$287,511, ten years until positive taxable income, and current breakeven value of \$348,867. In the case of Amazon, the results represent an actual realization of a startup that has gone through a nine year development period (1994-2001) and then a subsequent period of positive earnings (2002-2016) with the exception of one year, 2003. In this case, the current breakeven value of \$540,457 represents an actual application of the carryforward rules. The results show that for the firms in Table 2 losses can shield earnings from 8 to 13 years.

Conclusion

The results indicate that operating losses that accrue during the early development phase of a startup can shelter future taxes for a number of years. These NOL carryforwards provide a government subsidy for startups and other firms and buffer them from the costs of starting an enterprise or downturns in the economy. In addition, assuming a breakeven level of earnings going forward, a method of valuing the NOLs for startup firms is proposed based on the present value of the future tax savings.

References

- Auerbach, A.J. and J.M. Poterba (1987). Tax loss carryforward and corporate tax incentive, chapter in *The Effects of Taxation on Capital Accumulation*, ed. Martin Feldstein, 305-342, University of Chicago Press, <http://nber.org/chapters/c11352>.
- Beach R. (2017). Implicit startup subsidies, *Proceedings of the 4th Appalachian Research in Business Symposium*, 96-99.
- Bloomberg Tax and Accounting (BTA) Center (2017). Portfolio 593: Net operating losses – concepts and computation.
- Cooper, C. and M. Kittel (2006). Partial loss refundability: How are corporate tax losses used? *National Tax Journal* 59 (3), 651-663.
- De Waegenare A., R.C. Sansing, and J.L. Wielhouwer (2003). Valuation of a firm with a tax loss carryover, *Journal of American Taxation Association* 25 (supplement), 65-82.
- Grahm, J.R. and H. Kim (2009). The effect of the length of tax-loss carry back period on tax receipts and corporate marginal tax rates, NBER Working Paper 15177, <http://nber.org/papers/w15177>.
- Sarkar, S. (2014). Valuation of tax loss carryforwards, *Review of Quantitative Finance and Accounting* 43, 803-828.
- Streitferdt, F.G. (2013). The valuation of tax loss carryforwards, *Journal of Business Valuation and Economic Loss Analysis* 8(1), 163-184.

Onboarding Freshman Business Students: Mindfulness, Learning, and a Business Plan for Life

Roberson, Michael
Department of Management, Marketing, and International Business
College of Business & Technology
Eastern Kentucky University
011 Business and Technology Center
Richmond, KY 40475
mike.roberson@eku.edu
859.622.4984

Key words: Onboarding, students, mindfulness, self-regulation, business plan, concentration, learning

Introduction

Today's business students face new challenges to their concentration, study, and accomplishment, in addition to those experienced by previous generations. Technology such as smart phones provides almost irresistible temptations that can reduce study time and impact the amount and quality of concentration (Rosen, Carrier, and Cheever, 2013; Roberts, 2016; Bowman, Waite, and Levine, 2015). Further, business students spend less time studying than college faculty members believe it takes to be successful (NSSE, 2015; McCormick, 2011). The practice of mindfulness (Langer, 1989; Salomon and Globerson, 1987) and self-regulated learning (Zimmerman and Kitsantas, 2007) provide tools to help students address these challenges.

Previously, the value of a series of mindfulness and self-regulation assignments for business students was established (Polin and Roberson, 2016; Roberson, 2017a; Roberson, 2017b). The present study investigated the use of those same assignments and additional readings and assignments in an enhanced onboarding course for freshman students.

Methodology

A major redesign of an existing Student Success Seminar course for freshman business students was completed and tested. Because this course was only a one-credit hour course, efforts were made to introduce important, new content along with opportunities to develop knowledge and skills that would be useful introductions to college life, while not overloading students in this one-credit class.

Learning objectives. The learning objectives the Student Success Seminar were as follows:

1. To establish a foundation of knowledge, skills, and habits that are essential for success as students and as business professionals.

2. To learn what it means to make mindful, self-regulated choices.
3. To create a detailed business plan for his/her life.
4. To become familiar with the array of resources and forms of assistance that are available to students.
5. To work to become socialized into the university family and to feel both comfortable and confident that he/she can succeed in college and in life.

Course content. In addition to traditional freshmen orientation topics, this course included readings, quizzes, and worksheets related to special subject-matter believed to be crucial to long-term student and professional success. Assignments aimed to student learning and growth in the following areas: 1) to promote mindfulness and self-awareness, 2) to learn key concepts about memory, concentration and learning, 3) to develop an appreciation for common barriers to learning, and 4) to gain knowledge and practice in goal setting and time management. These assignments culminated with the most significant assignment – creating a detailed business plan for life. A list of topics and assignments is shown in Table 1.

Course format. Due to the large size of the class (which began with 74 students) there were two types of class sessions: whole-class sessions (held in the auditorium) and four break-out sessions. Separate breakout sessions were facilitated by the professor and his graduate assistant, and they were held on Tuesdays and repeated on Thursdays, resulting in four “teams” of 18-19 students each. These smaller breakout sessions allowed the facilitators to involve every student and to discuss topics in depth.

Assignments. Students were given a variety of assignments intended to touch on many of the important college skills they would need in the future. There were short but impactful readings, timed Blackboard quizzes (4), written worksheet assignments (6), class discussions requiring each student to participate, attendance at five university events (chosen from a long list of options), and a business plan for life. Content of the business plan for life assignment is shown in Table 2.

Results and Implications

Instant polls. Instant cell phone polls were taken throughout the course, both to engage and involve students and to collect meaningful information for discussion. The free site *directpoll.com* was used for the polling. When students entered the classroom on a day polling was used, a short url was displayed on screen, and students entered it in their phone. Then, as the professor advanced the poll questions from his computer, questions appeared on students’ phones, and they answered them. Later, the professor would bring up the results to individual poll questions and discuss them with the class. (Students were instructed to put away their phones as soon as the poll was complete and not look at them for the remainder of the class period.) Sample poll results are shown in Figures 1 and 2. Figure 1 shows self-reports of their use of a calendar/ planner or other means of keeping track of assignments for classes. As can be seen, by week 3 of their college careers more than half of business students were not actively recording assignments and deadlines in any reliable or systematic manner. Figure 2 shows student reports of the challenges and obstacles that they believed could interfere with their studies, and the poll permitted participants to select all of the issues that applied to them. While some of the responses were expected (e.g., procrastination, social media, hanging out with friends), several responses were less expected and led to important

discussions about somewhat sensitive topics. For example, reports of feeling lonely and isolated prompted a discussion about important student support resources ranging from the university's Counseling Center to dorm counselors and others. Important and surprisingly frank discussions also occurred about partying/drinking and making unwise choices.

Topic	Assignment(s)
Getting off to a great start in college	Reading; Quiz 1; <i>Worksheet 1 (self-reflection)</i>
Green dot training	
Memory and learning	Reading; Quiz 2
Mindfulness and switch tasking	Reading; Quiz 3; <i>Worksheet 2 (switch tasking)</i>
Overcoming procrastination	<i>Worksheet 3 (procrastination)</i>
Preparing for Spring semester scheduling	
Achieving great concentration (and why it matters)	Reading; Quiz 4; <i>Worksheet 4 (goals and actions to improve concentration)</i>
Sources, searches, and citations	Computer Lab assignments
LinkedIn presentation and information	Professional headshots taken
Business plan for life – creating your personal brand	Reading
Dressing for professional success (on a budget)	
Goal setting and time management	Reading; <i>Worksheets 5 and 6 (time use inventory and time log)</i>
Discussion of majors in the School of Business	Business Plan for Life due; Proof of attendance at five university events

Table 1. Course Topics and Assignments

Topic	Description
Description of Your Ideal Future	Professional (1 paragraph), Personal (1 paragraph)
Career Goals	First job, career in 10 years, highest career goal
Other Life Goals	As appropriate
Personal SWOT Analysis	Strengths, development needs, opportunities, threats
Your Personal Brand	Summary statement (describe the factors that will make you rare or unique and give potential future employers reason to hire you)
Copy of your LinkedIn page	Profile, professional headshot photo, link with at least two professors, link with at least two fellow students, follow Eastern Kentucky University
Action Plans	For each year, list one or more specific actions you will take each year to help you achieve your career and life goals – freshman, sophomore, junior, senior, early career

Table 2. Description of the Business Plan for Life Assignment

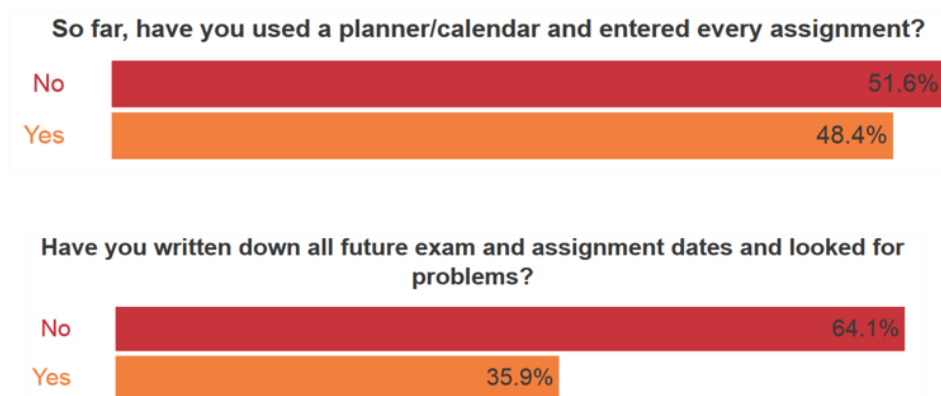


Figure 1. Instant Poll Results Regarding Students' Tracking of Assignments

On the first day of class, another poll question asked these freshman students to estimate the number of hours per week they expected to study in college. Those results are reported in Table 3 along with results of a survey of juniors and seniors at our university last year and a large sample of business students nationwide in the National Survey of Student Engagement (NSSE). Surprisingly, these freshmen expected to study more than upper classmen reported actually studying, both at our university and nationwide. Later evidence suggests that the freshmen did not

meet their own expected study time targets during their first semester, but it is interesting that their expected study time more closely matched faculty expectations than did upper classmen.

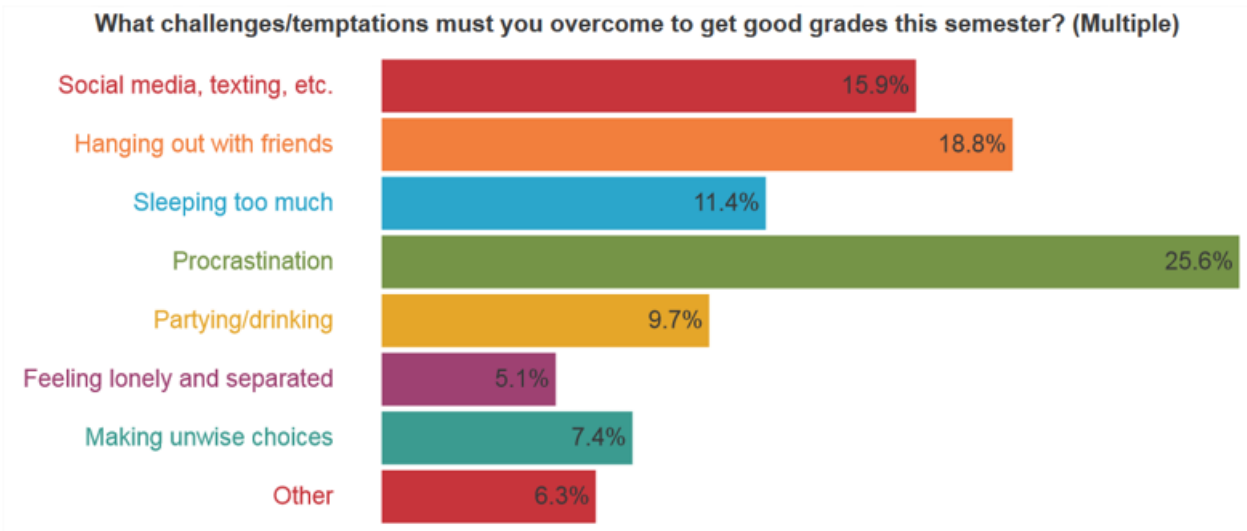


Figure 2. Student Challenges and Temptations That Must Be Overcome

Study Hours Per Week	Freshmen Expected 2017 (n=68)	Upper Class Actual 2016 (n=130)	NSSE Business Actual (n=22,392)
0 - 5	1.5	11.5	16.2
6 - 10	14.7	34.6	26.2
11 - 15	38.2	24.6	21.1
16 - 20	27.9	13.1	17.6
21 - 25	11.8	11.5	9.1
26 - 30	5.9	3.8	4.8
31 or more	0.0	0.8	5.0

Table 3. Comparison of Freshmen Expected Study Hours with Upper Class Actual Study Hours

Participant reactions to assignments. Students’ reactions to the mindfulness and self-regulation readings and worksheets were measured through an anonymous Qualtrics survey. Previously, junior-level students in a Principles of Management course had completed the same assignments, and responses from the two groups are shown in Table 4. Both groups reported that the assignments were relevant to their careers, made them think, and should be continued in the future.

The Assignments . . .	Upper Classmen N = 70			Freshmen N = 56		
	Mean	Agree %	Disagree %	Mean	Agree %	Disagree %
1. were quite relevant to my future career in business.	4.86	92.9	7.1	4.70	91.1	8.9
2. were personally interesting to me.	4.71	90.0	10.0	4.36	76.8	23.2
3. were a waste of my time. (reverse scored)	2.27	15.7	84.3	2.55	21.4	78.6
4. made me think.	5.00	97.1	2.9	4.80	91.1	8.9
5. exposed me to ideas that every business student should learn.	4.99	95.7	4.3	5.02	92.9	7.1
6. have not had any impact on my thinking and learning. (reverse scored)	2.16	11.4	88.6	2.43	17.9	82.1
7. have caused me to make significant changes in the ways I think and learn.	4.41	84.3	15.7	4.00	72.7	27.3
8. should be continued in this course in the future.	5.01	91.4	8.6	4.73	91.1	8.9
9. caused me to develop new habits that I will retain after this course is completed.	4.66	91.4	8.6	4.48	82.1	17.9

Table 4. Freshman and Upper Class Student Reactions to Mindfulness and Self-regulation Assignments

Conclusions

The pilot test of the enhanced Student Success Seminar was a success. In particular, the Business Plan for Life assignment proved particularly valuable. Lessons were learned that can be incorporated into the course in the future. This cohort of students will be followed over the next three years to determine if the change in course content and assignments have any lasting impact on student concentration, learning, and achievement.

References

- Bowman, L. L., Waite, B. M., & Levine, L. E. (2015). Implications for College Students. *The Wiley Handbook of Psychology, Technology and Society*, 388.
- Langer, E. J. (1989). *Mindfulness*. Cambridge, MA: Da Capo Press.
- McCormick, A. C. (2011). It's about time: What to make of reported declines in how much college students study. *Liberal Education*, 97(1), 30-39.
- National Survey of Student Engagement (2016). NSSE 2016 U.S. summary means and standard deviations by related-major category. Bloomington, IN: Indiana University Center for Postsecondary Research. Retrieved from nsse.indiana.edu/links/summary_tables.
- Polin, B., & Roberson, M. (2016). Toward mindful, self-regulated learning: Creation of a learning academy for management students. *Proceedings of the 2016 Organizational Behavior Teaching Conference*, Walsh University, Canton, OH.
- Roberson, M. T. (2017a). Mindfulness and Self-Regulation: A Series of Application Assignments. *Proceedings of the 2017 Organizational Behavior Teaching Conference*.
- Roberson, M. T. (2017b). Exploring the Utility of Mindfulness and Self-regulation Assignments for Business Students. *Proceedings of the 2017 Appalachian Research in Business Symposium*.
- Rosen, L. D., Carrier, L. M., & Cheever, N. A. (2013). Facebook and texting made me do it: Media-induced task-switching while studying. *Computers in Human Behavior*, 29(3), 948-958.
- Salomon, G., & Globerson, T. (1987). Skill may not be enough: The role of mindfulness in learning and transfer. *International Journal of Educational Research*, 11(6), 623-637.
- Zimmerman, B. J. & Kitsantas, A. (2007). The hidden dimension of personal competence: Self-regulated learning and practice. In A.J. Elliot and C.S. Dweck (Eds.), *Handbook of Competence and Motivation*, (pp. 204-222). New York: Guilford Press.

Reverse Logistics: Scenarios Related To Drone Deliveries and Returns

Fowler, Victoria
Honors Student
Walker College of Business
Appalachian State University
Boone, NC 28608
fowlervg@appstate.edu
828.262.2411

Medlin, Dawn B.
Department of Computer Information Systems
and Supply Chain Management
Appalachian State University
Boone, NC 28608
medlinbd@appstate.edu
828.262.2411 (Contact Author)

Vannoy, Sandra A.
Department of Computer Information Systems
and Supply Chain Management
Appalachian State University
Boone, NC 28608
vannoysa@appstate.edu
828.262.6186

Key words: Drones, Supply Chain Management, Reverse Logistics

Introduction

Over the past decade, Supply Chain Management (SCM) has emerged as a novel buzz term in the corporate world, even though it has a long history. A supply chain involves various participants such as customers, vendors, and others who perform a sequence of tasks or activities that move physical goods or services from one location to another (Crandall, Crandall, Chen, 2015). Generally, a supply chain simply involves participants who place orders (known as upstream) to vendors such as Amazon, who then fill the orders and send them to the customers (known as downstream). Throughout this process there may be other companies or vendors involved, but for simplification purposes we will use this simplistic view of a supply chain as described above. Upstream and downstream activities are “linked,” together through either physical or information flows.

SCM has become a key factor in achieving a competitive advantage in the marketplace. Companies have been operating and managing supply chains as long as businesses have existed, but they were not identified using that term. Recently, many industries have paid close attention to the potential benefits of a supply chain decision as it could have immediate impact upon their bottom line.

One company that has been a leader in the area of supply chain management and its usage is Amazon and its fulfillment centers. Amazon is also a leader in the use of innovative technologies within its supply chain such as drone delivery. While little is currently known about the promise and potential for drone delivery for major online retailers such as Amazon, research firm Skylark Services suggests that in any given day 110 million online orders are placed, with 100 million of the products ordered weighing under five pounds. This evidence suggests that there is huge economic potential for drone delivery, and in fact, Skylark predicts a major disruption of the delivery world as we know it (Jenkins, Vasigh, Oster and Larson, 2017).

While drone delivery is an exciting innovation for supply chain logistics, little is known about issues of product returns via drone or what is known as reverse logistics in the supply chain.

The purpose of this article is to discuss the topic of reverse logistics in the supply chain, and specifically current advantages and disadvantages of a drone delivery service as related to the return of a product.

Literature Overview

Unmanned aerial vehicles (or UAVs) are vehicles that can complete continuous flight without an onboard pilot. They were first used for military purposes from the 1970s to 1980s, and were later adopted for commercial use in the latter 1990s. Technological improvements such as better accuracy and controllability instigated more interest in drones by the early 2000s. Companies such as Amazon and other product or services delivery companies are now able to provide faster deliveries without human intervention.

Customers who are Prime Amazon members have become accustomed to delivery within a two-day period. The expectations of promptness of deliveries have spilled over into other companies such as the U.S. Post Office, DHL, and United Parcel Service (UPS). The expectation for virtually instant delivery service has been met by Amazon and their inclusion of Prime Air in some areas of the U.S., by providing drone deliveries that can be made on an hourly and daily basis (Bambrury, 2015). However, delivery of products purchased online must be economically viable for both the consumer and the seller (Laguna & Marklund, 2005, Donahoe, 2016). A typical FedEx package that costs \$8.50 has ground costs of approximately \$2.72 (French, 2017). Amazon's purported cost of last-mile delivery with the USPS is \$2.50. Therefore, drone delivery below \$2.50 becomes the economic benchmark (Jenkins, 2017).

In summary, Jenkins et al (2017) provide the following economic predictions regarding drone delivery:

- Reduction of delivery costs to as little as \$1.00 per delivery.

- Upward of 86 million package deliveries per day within 20 years.
- Annual savings to logistics companies of \$2 billion to \$10 billion.

The potential for economic advantages of drone delivery sound enticing, but there are disadvantages particularly associated with the economics of last-mile delivery. The number of drop-offs you can make on a delivery route, or the “route density” is an important variable. Another is drop-size, or the number of parcels per stop. As the number of deliveries increases on a given route, the cost per delivery decreases. Similarly, as the number of items dropped off at a particular location increases, the cost per item delivered decreases. Currently, drones perform poorly on both route density and drop-size. Most drones carry only one package and then have to recharge before moving on to the next delivery (Wang, 2016).

There are logistical disadvantages as well. For instance, there may be a change in the weather or there could be areas where mapping is not completed, or most disconcerting for consumers may be the issue of returning a product (Pogue, 2016). Additional current challenges to potential economic impact for drone delivery include the need for beyond visual line of sight and autonomous operations.

Perhaps most complex is the product return. Much focus has centered on the delivery of a product, but what about the ‘activity of return’ makes it less simple for the consumer? Due to its nascence, there is a gap in the literature concerning the return of a product or products using drones. As drones move into a heavier adoption phase, some major concerns may arise in the future due to government regulations and laws that may be related to the product – such as pharmaceutical deliveries. Already in some countries, medicine is being delivered by drones, but what should occur if a delivery of a controlled substance is not correct and must be returned to the pharmaceutical company? What type of instructions must be carried out?

Below, differing scenarios and questions are presented that consumers and suppliers may face in the future.

1.1 Returns Scenario

What if a customer ordered a product from Amazon, but when it arrived, it was a different color than the one that was ordered? The customer could use the Amazon app on his or her phone to place a Product Return Order. The app would then instruct the customer to put the incorrect item back into the box that the original drone had delivered it in and place it on a specific location on their property. If a drone was already in the area delivering a package, a notification would be sent to it to pick up the Product Return Order on its route back to the Amazon warehouse. If there was not a drone within a certain radius, one would be dispatched to pick up the package and return it to Amazon. Once the product arrives at the warehouse and undergoes inspection, the customer will be sent a receipt notification and refund. This is certainly a benefit to have an item received so quickly and the item to be able to be returned so promptly, but the question remains, how savvy will consumers be in conducting this type of return policy and procedure? What about weather issues and if the navigational system of satellite or other services are not working properly?

1.2 Repairs Scenario

What if a customer breaks down on the side of the road due to a flat tire, battery issue, or running out of gas? The customer could use the AAA Roadside Assistance app on their phone to report the type of issue. A drone would then be deployed from a repair center, using the location services of the customer's phone to determine its destination. The drone would have a speaker on it with step-by-step instructions for the customer as well as any tools necessary to complete the repair. Depending on the issue, a new tire, battery, or gallon of fuel may also be attached to the drone. AAA Roadside Assistance could cut their service time in half and customers could be back on the road in a matter of minutes. Additionally, without the involvement of a human, benefits such as retirements and other similar costs could be saved. The question also remains in this situation, what if the wrong product is delivered, or the incorrect address is provided by the consumer? Or what if the drone breaks down and the customer continues to wait for assistance with no human involvement? How long should they wait and is there a 1-800 number for the consumer to call?

1.3 Hazardous Waste Disposal Scenario

What if a restaurant had an issue with hazardous grease disposal? Restaurants produce an average of 40 lbs. of grease per week. However, most restaurants only dispose of their grease once a month. Collecting old grease creates many hazards, such as fire and health risks. With weekly drone pickups, the grease could be taken to a biodiesel company for a healthier and easier waste disposal activity. This could benefit both the restaurants and the biodiesel production plants. But what if the drone dropped the product over a busy highway causing possible automobile accidents and/or deaths? Who is responsible?

This study attempts to identify different scenarios that a company and consumer might face while attempting to return products that have been delivered by drones and attempting to return them in the correct form or method. As mentioned above in the scenarios, each can offer an advantage, but what about the disadvantages of returns whether it be for items that are not the right color, or repairs, or other situations where the drone must be responsible for the return of the item? Many issues regarding who is responsible for returns are still unaddressed – the consumer or the company.

Conclusion

The economic promise of drone delivery is strong. Certainly, implementing delivery drones is in line with the business process improvement perspectives of many organizations, and as such drones offer advantages such as the efficiencies of business operations (in terms of costs, service responsiveness and flexibility). Therefore, it should be expected that the number of drone deliveries and returns will only grow in the coming years as companies use this type of delivery method in order to remain competitive. While much attention is being paid to efficient and effective delivery of products via drone, questions surrounding product returns must also be answered. Additionally, further research is needed to examine return scenarios that may create legal issues. Future research is needed to address these questions.

References

- Bamburry, Dane. (2015). Drones: Designed for product delivery. Wiley Online Library. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/drev.10313/pdf>.
- Crandall, R.E., Crandall, W. R., & Chen, C.C. Principles of Supply Chain Management, CRC Press, Boca Raton, 2015.
- Donahoe, S. (2016). Amazon and Drone Delivery: The Pros and Cons. Retrieved from <http://imsuccesscenter.com/amazon-and-drone-delivery-the-pros-and-cons/>.
- French, S. (2017). Drone delivery economics: Are Amazon drones economically worth it? Retrieved from <http://thedronegirl.com/2017/05/07/drone-delivery-economics-amazon-drones/>
- Jenkins, D., Vasigh, B., Oster, C., & Larsen T. Forecast of the Commercial UAS Package Delivery Market. Retrieved from <http://nebula.wsimg.com/28ad8975cfef999798fa4b20e7238f67?AccessKeyId=02FB2B5A65F7EC056121&disposition=0&alloworigin=1>
- Laguna, J., & Marklund, M., Business Process Modeling, Simulation, and Design, Prentice Hall, New Jersey, 2005.
- Pogue, David. (2016). Amazon reveals details about its crazy drone delivery program. Yahoo Tech. Retrieved from <https://www.yahoo.com/tech/exclusive-amazon-reveals-detailsabout-1343951725436982.html>.
- Wang, D. (2016). The Economics of Drone Delivery. Retrieved from <https://spectrum.ieee.org/automaton/robotics/drones/the-economics-of-drone-delivery>

Social Constructivism and Cooperative Learning in Marketing Courses: A Sample In-Class Activity

Boutin, Jr., Philip J.
Department of Management, Marketing, and International Business
College of Business & Technology
Eastern Kentucky University
521 Lancaster Avenue, BTC 124
Richmond, KY 40475
philip.boutin@eku.edu
859.622.4981

Key words: cooperative learning, social constructivism, in-class activity, group activity, SWOT analysis

Introduction

The normative approach utilized for this paper is focused on the belief that instructors, course designers, and various other learning professionals should leverage learning theories when creating and managing college-level courses. These theories can inform and improve the design and development of various instructional and learning activities. In this paper, contributions from the extant literature on *cooperative learning* (primary focus of the paper), *social constructivism* (learning theory that serves as the foundation for cooperative learning), and *strengths-weaknesses-opportunities-threats (SWOT) analysis* (focus of sample in-class group activity provided at the end of the paper that follows basic principles of cooperative learning and social constructivism) are reviewed.

Literature Overview

Cooperative Learning

Cooperative learning is defined by Li and Lam (2013, p. 1) as “a student-centered, instructor-facilitated instructional strategy in which a small group of students is responsible for its own learning and the learning of all group members. Students interact with each other in the same group to acquire and practice the elements of a subject matter in order to solve a problem, complete a task or achieve a goal.” It is an alternative to lecture-based instruction and it was developed to improve student cognitive outcomes (Tran & Lewis, 2012). Notably, cooperative learning techniques have been found to be more effective than lecture-based teaching techniques, with cooperative learning increasing or enhancing cognitive activities and encouraging and promoting student performance (Tran, 2014).

There are five basic principles and elements that should be part of class activities based on the cooperative learning method: 1) *positive interdependence*; 2) *face-to-face promotive interaction*; 3) *individual accountability*; 4) *appropriate use of social, interpersonal, collaborative and small-group skills*; and 5) *quality of group processing* (e.g., Cheng & Walters, 2009; Johnson & Johnson, 1999; Johnson, Johnson & Holubec, 2008; Li & Lam, 2013; Tran, 2014). First, regarding *positive interdependence*, it “means that in cooperative learning situations, students are required to work together as a cohesive group to achieve shared learning objectives” (Tran, 2014, p. 132). Second, *face-to-face promotive interaction* means that some of the group work will need to be completed face-to-face and interactively (though some can be assigned to and completed by various individual members), with each group member providing the others with input on their views, reasoning, conclusions, etc., as well as providing assistance, support, and encouragement to their fellow group members when necessary (Li & Lam, 2013). Third, *individual accountability* means that students request help, put forth their best effort, take their work seriously, assist other group members, and support (take care of) one another (Johnson, 2009). Fourth, according to Tran (2014), teaching the *appropriate use of social, interpersonal, collaborative and small-group skills* helps students cooperate effectively in the group and “group processing is clarifying and improving the effectiveness of the members in contributing to the joint efforts to achieve the group’s goals” (p. 132). Fifth and lastly, *quality of group processing* means that “team members set group goals, describe what member actions are helpful or not, periodically assess what they are doing well as a team, and identify changes they will make to function more effectively in the future” (Li & Lam, 2013, p. 4). According to Li and Lam (2013), structuring these five basic principles and elements into group learning situations helps guarantee cooperative efforts take place and facilitates the successful implementation and use of cooperative learning by students and instructors.

There is considerable theoretical support for cooperative learning having a positive effect on both academic and social outcomes (Johnson & Johnson, 2009; Tran, 2014). Notably, sociologist Elizabeth Cohen has provided multiple contributions with various co-authors supporting the view that the general effectiveness of cooperative learning was well established (e.g., Cohen & Lotan, 2014; Cohen, Brody, & Sapon-Shevin, 2004). A sizeable body of cooperative-learning research published since the 1970s has specifically investigated outcomes with learners ranging in age from young children through those in higher or tertiary education institutions (i.e., universities, trade schools, colleges, etc.). A focus on outcomes is certainly reasonable since it is important for education institutions to champion and implement a pedagogy that demonstrates efficacy (Baloche & Brody, 2017). More specifically, a substantial number of studies over the past several decades have provided considerable empirical support for the positive impact of cooperative learning (e.g., Underwood, McCaffrey, & Underwood, 1990; van Boxtel, van der Linden, & Kanselaar, 2000; Yager, Johnson, & Johnson, 1985). In addition, the performance of cooperative groups has been found to generally exceed that of both competitive groups and individuals (e.g., Blaye, Light, Joiner, & Sheldon, 1991; Hooper, 1992; Hooper, Temiyakarn, & Williams, 1993; Johnson & Johnson, 1999; Johnson, Johnson, & Skon, 1979; Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Roseth, Johnson, & Johnson, 2008). Baloche and Brody (2017) also noted that along with individual research studies, multiple meta-analyses and best-evidence syntheses illustrating the value and efficacy of cooperative learning have also been generated and published (e.g., Johnson, Johnson, Roseth, & Shin, 2014; Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Qin, Johnson, & Johnson, 1995; Slavin 1989, 2013).

Social Constructivism

Constructivism is a paradigm that assumes that learning is an active, constructive process, the learner is an information constructor, and individuals actively create their own subjective representations of objective reality. New information is connected to previous knowledge, and mental representations are subjective (Learning-Theories.com, 2015). Constructivism is frequently connected with pedagogic approaches that promote or encourage active learning, or learning by doing (Kirschner, Sweller, & Clark, 2006; Tobias & Duffy, 2009). A specific type of constructivism is *social constructivism*, which is “a learning theory based on the ideas of (Lev Semyonovich) Vygotsky (1978) that human development is socially situated and knowledge is constructed through interaction with others” (McKinley, 2015, p. 1). According to Creswell (2014), social constructivism is a helpful theoretical framework because it allows for the necessary qualitative analysis to provide insight on how people interact or connect with the world around them. It also states that one’s ideas correspond with their individual experiences, which contributes to the construction of their identity. Regarding the implications of social constructivism for teaching, the teacher facilitates and guides collaborative learning, which includes the use of group work and group activities (University of California-Berkeley Graduate Student Instructor Teaching & Research Center, n.d.).

Research studies focused on increasing student discussion in the classroom not only support but also are grounded in social constructivism. In addition, there is a full assortment of advantages that occur due to implementing discussion in the classroom. For example, many research studies contend that discussion plays a critical role in increasing the ability of students to investigate and test their ideas, synthesize the ideas of others, and develop a deeper comprehension of what they are learning (Corden, 2001; Nystrand, 1997; Reznitskaya, Anderson, & Kuo, 2007; Weber, Maher, Powell, & Lee, 2008). Moreover, students have more opportunities to employ self-determination, self-regulation, and a will to persevere with tasks through the use of large and small group discussions (Corden, 2001; Matsumura, Slater, & Crosson, 2008). Discussion increases and encourages collaborative abilities, problem-solving capabilities, and student motivation (Dyson, 2004; Matsumura, Slater, & Crosson, 2008; Nystrand, 1997). Furthermore, the ability of students to support their thinking or points of view, develop their reasoning skills, and argue their opinions both respectfully and persuasively is improved when they have more opportunities to speak with one another and participate in discussions about their ideas (Reznitskaya, Anderson, & Kuo, 2007). Additionally, by providing more opportunities for students to speak with one another in the classroom, there is an increase in the feeling of community and collaboration (Barab, Dodge, Thomas, Jackson, & Tuzun, 2007; Weber, Maher, Powell, & Lee, 2008).

Strengths-Weaknesses-Opportunities-Threats (SWOT) Analysis

One approach often utilized by firms when conducting a comprehensive analysis of their situation is a SWOT analysis, through which they offer a self-assessment of their Strengths (S), Weakness (W), Opportunities (O), and Threats (T). Examples of each include:

- *Strengths (S)*: e.g., internal capabilities, resources, and positive situational factors that may help the company to serve its customers and achieve its objectives.

- *Weaknesses (W)*: e.g., internal limitations and negative situational factors that may interfere with the company's performance.
- *Opportunities (O)*: e.g., favorable factors or trends in the external environment that the company may be able to exploit to its advantage.
- *Threats (T)*: e.g., unfavorable external factors or trends that may present challenges to performance (Armstrong and Kotler 2007, p. 54).

Customary explanations of SWOT analysis makes the technique appear to be an easy-to-apply approach: Simply fill in the quadrants of a 2x2 matrix (or table) that includes spots for listing *strengths* and *weaknesses* (i.e., internal factors) and *opportunities* and *threats* (i.e., external factors), with *strengths* and *opportunities* being the favorable factors and *weaknesses* and *threats* being the unfavorable factors. Then, consider how strengths can be leveraged to achieve opportunities and how weaknesses, which exacerbate threats or hinder progress, can be overcome or mitigated (e.g., Hofer & Schendel, 1978; Kotler, 2000; Schnaars, 1998; Thompson & Strickland, 1998).

Sample In-Class Activity

The focus of this in-class activity, which is based largely on the aforementioned principles of cooperative learning and social constructivism, is on SWOT analysis and is to be completed by student groups of 3-5 students. It would be best used in introductory courses taken by most undergraduate business students early in their pursuit of a business degree. Each student is provided with a handout that describes a scenario and task (instructions), which are provided below, as well as a 2x2 matrix grid handout on paper on which they record information on each of the four components (see Figure 1 below). All students are to be encouraged to utilize the relevant content in their course textbook or from other credible sources, including various Web sites, to successfully complete the activity. Each student group has a set amount of time to complete the activity before reporting its findings, analysis, and decisions to the rest of the class. Instructors can also award points to students for participating in this activity.

Scenario

“Your group is employed as the management team of an existing company to be selected by the members of your group. The company cannot be one for which a SWOT analysis is provided in the course textbook, in any of the other course materials, or in any other non-course materials obtained by or in possession of your group. The company can operate in any industry(ies) or sector(s) when conducting its primary business activity, including Business-to-Business (B2B), Business-to-Consumer (B2C), and/or Business-to-Government (B2G). In addition, the products (i.e., goods and services) that it offers, promotes, and sells for its primary business activity can be goods with no accompanying services (e.g., office supplies, soft drinks), goods with accompanying services (e.g., air conditioners with installation, automobiles with warranty), hybrid of equal parts goods and services (e.g., restaurants, supermarkets), services with supporting goods and services (e.g., airlines with in-flight snacks, hotels with room service), or services with no accompanying goods (e.g., consulting services, financial services).”

Group #: _____ Group Members: _____	
STRENGTHS	WEAKNESSES
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
OPPORTUNITIES	THREATS
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Figure 1. Sample SWOT Analysis Grid Handout

Task (Instructions)

*“As part of the company’s annual strategic planning process, your group needs to conduct a SWOT analysis, including doing the necessary secondary research using all available online and offline sources at your disposal. Specifically, your group needs to provide on the appropriate sheets as many relevant items that can be considered Strengths, Weaknesses, Opportunities, and Threats to your company. There should be at least five (5) items for each component of the SWOT analysis, though the final number in each category should accurately reflect the company’s overall situation. Therefore, if your group believes the company has more strengths than weaknesses, opportunities than threats, or vice versa in either case, then your lists for each component should reflect that in length and in proportion. Your group also needs to identify and list its Competition, both direct and indirect competitors, as well as indicating in which area(s) your company is most vulnerable to its competitors. Your group should do this before or after you identify and list as many relevant items for each component of the SWOT analysis, as it can help you with the identification and listing of the items. **Your group will have XX minutes to complete the activity before reporting its findings, analysis, and decisions to the rest of the class.**”*

Conclusion

This paper and the SWOT analysis in-class group activity it provides and describes can be used by marketing faculty for certain courses they teach. By having students complete this in-class group activity, faculty will be utilizing a cooperative learning approach supported by social constructivism, a longtime theory of knowledge, with students potentially reaping the learning benefits of such a teaching approach. Future contributions should try to improve this in-class group activity as well as create and implement similar activities for other marketing-related concepts, frameworks, and models.

References

- Armstrong, G., & Kotler, P. (2007). *Marketing: An Introduction* (8th ed.). Upper Saddle River, NJ: Prentice Hall.
- Baloche, L., & Brody, C. M. (2017). Cooperative Learning: Exploring Challenges, Crafting Innovation. *Journal of Education for Teaching*, 43(3), 274-283.
- Barab, S., Dodge, T. Thomas, M. K., Jackson, C., & Tuzun, H. (2007). Our Designs and the Social Agendas They Carry. *Journal of the Learning Sciences*, 16(2), 263-305.
- Blaye, A., Light, P., Joiner, R., & Sheldon, S. (1991). Collaboration as a Facilitator of Planning and Problem Solving on a Computer-based Task. *British Journal of Developmental Psychology*, 9(4), 471-483.
- Cheng, D., & Walters, M. (2009). Peer-Assisted Learning in Mathematics: An Observational Study of Student Success. *Australasian Journal of Peer Learning*, 2(3), 23-39.
- Cohen, E. G., & Lotan, R. A. (2014). *Designing Groupwork: Strategies for the Heterogeneous Classroom* (3rd ed.). New York, NY: Teachers College Press.
- Cohen, E. G., Brody, C. M., & Sapon-Shevin, M. (2004). *Teaching Cooperative Learning: The Challenge for Teacher Education*. Albany, NY: State University of New York Press.
- Corden, R. E. (2001). Group Discussion and the Importance of a Shared Perspective: Learning from Collaborative Research. *Qualitative Research*, 1(3), 347-367.
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). Thousand Oaks, CA: Sage Publications.
- Dyson, A. H. (2004). Writing and the Sea of Voices: Oral Language In, Around, and About Writing. In R. B. Ruddell & N. J. Unrau (Eds.), *Theoretical Models and Processes of Reading* (pp. 146–162). Newark, DE: International Reading Association.
- Hofer, C. W., & Schendel, D. (1978). *Strategic Formulation: Analytical Concepts*. St. Paul, MN: West Publishing Company.
- Hooper, S. (1992). Effects of Peer Interaction During Computer-Based Mathematics Instruction. *Journal of Educational Research*, 85(3), 180-189.
- Hooper, S., Temiyakarn, C., & Williams, M. D. (1993). The Effects of Cooperative Learning and Learner Control on High- and Average-Ability Students. *Educational Technology Research and Development*, 41(2), 5-18.
- Johnson, D. W. (2009). *Reaching Out: Interpersonal Effectiveness and Self-Actualization* (10th ed.). Boston, MA: Pearson Education.

Johnson, D. W., & Johnson, R. T. (1999). Making Cooperative Learning Work. *Theory into Practice*, 38(2), 67-73.

Johnson, D. W., & Johnson, R. T. (2009). An Educational Psychology Success Story: Social Interdependence Theory and Cooperative Learning. *Educational Researcher*, 38(5), 365-379.

Johnson, D. W., Johnson, R. T., & Holubec, E. J. (2008). *Circles of Learning: Cooperation in the Classroom* (8th ed.). Edina, MN: Interaction Book Company.

Johnson, D. W., Johnson, R. T., & Skon, L. (1979). Student Achievement on Different Types of Tasks under Cooperative, Competitive, and Individualistic Conditions. *Contemporary Educational Psychology*, 4(2), 99-106.

Johnson, D. W., Johnson, R. T., Roseth, C., & Shin, T. S. (2014). The Relationship Between Motivation and Achievement in Interdependent Situations. *Journal of Applied Social Psychology*, 44(9), 622-633.

Johnson, D. W., Maruyama, G., Johnson, R., Nelson, D., & Skon, L. (1981). Effects of Cooperative, Competitive, and Individualistic Goal Structures on Achievement: A Meta-Analysis. *Psychological Bulletin*, 89(1), 47-62.

Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching. *Educational Psychologist*, 41(2), 75-86.

Kotler, P. (2000). *Marketing Management: The Millennium Edition* (10th ed.). Upper Saddle River, NJ: Prentice Hall.

Learning-Theories.com (2015). Constructivism. Retrieved January 8, 2018, from <https://www.learning-theories.com/constructivism.html>.

Li, M. P. & Lam, B. H. (2013). Cooperative learning. *The Hong Kong Institute of Education*. Retrieved January 5, 2018, from <http://www.eduhk.hk/aclass/>.

Matsumura, L. C., Slater, S. C., & Crosson, A. (2008). Classroom Climate, Rigorous Instruction and Curriculum, and Students' Interactions in Urban Middle Schools. *The Elementary School Journal*, 108(4), 293-312.

McKinley, J. (2015). Critical Argument and Writer Identity: Social Constructivism as a Theoretical Framework for EFL Academic Writing. *Critical Inquiry in Language Studies*, 12(3), 184-207.

Nystrand, M. (1997). *Opening Dialogue: Understanding the Dynamics of Language and Learning in the English Classroom*. New York, NY: Teachers College Press.

Qin, Z., Johnson, D. W., & Johnson, R. T. (1995). Cooperative Versus Competitive Efforts and Problem Solving. *Review of Educational Research*, 65(2), 129-143.

- Reznitskaya, A., Anderson, R. C., & Kuo, L. J. (2007). Teaching and Learning Argumentation. *The Elementary School Journal*, 107(5), 449-472.
- Roseth, C. J., Johnson, D. W., & Johnson, R. T. (2008). Promoting Early Adolescents' Achievement and Peer Relationships: The Effects of Cooperative, Competitive, and Individualistic Goal Structures. *Psychological Bulletin*, 134(2), 223-246.
- Schnaars, S. P. (1998). *Marketing Strategy: Customers & Competition*. New York, NY: The Free Press.
- Slavin, R. E. (1989). Cooperative Learning and Student Achievement. In R. E. Slavin (Ed.), *School and Classroom Organization* (pp. 129-156). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Slavin, R. E. (2013). Cooperative Learning and Achievement: Theory and Research. In W. Reynolds, G. Miller, & I. Weiner (Eds.), *Handbook of Psychology*, Vol. 7: Educational Psychology (2nd Ed., pp. 199-212). Hoboken, NJ: John Wiley & Sons.
- Thompson, A. A., Jr., & Strickland, A. J. (1998). *Strategic Management: Concepts and Cases* (10th ed.). Boston, MA: Irwin/McGraw-Hill.
- Tobias, S., & Duffy, T. M. (Eds.) (2009). *Constructivist Instruction: Success or Failure?* New York, NY: Taylor & Francis.
- Tran, V. D. (2014). The Effects of Cooperative Learning on the Academic Achievement and Knowledge Retention. *International Journal of Higher Education*, 3(2), 131-140.
- Tran, V. D., & Lewis, R. (2012). Effects of Cooperative Learning on Students at An Giang University in Vietnam. *International Education Studies*, 5(1), 86-99.
- Underwood, G., McCaffrey, M., & Underwood, J. (1990). Gender Differences in a Cooperative Computer-Based Language Task. *Educational Research*, 32(1), 44-49.
- University of California-Berkeley Graduate Student Instructor Teaching & Research Center (n.d.). Overview of Learning Theories. Retrieved January 5, 2018, from <http://gsi.berkeley.edu/gsi-guide-contents/learning-theory-research/learning-overview/>.
- van Boxtel, C., van der Linden, J., & Kanselaar, G. (2000). Collaborative Learning Tasks and the Elaboration of Conceptual Knowledge. *Learning and Instruction*, 10(4), 311-330.
- Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Functions*. Cambridge, MA: Harvard University Press.
- Weber, K., Maher, C., Powell, A., and Lee, H. (2008). Learning Opportunities from Group Discussions: Warrants Become the Objects of Debate. *Educational Studies in Mathematics*, 68(3), 247-261.

Yager, S., Johnson, D. W., & Johnson, R. T. (1985). Oral Discussion, Group-to-Individual Transfer, and Achievement in Cooperative Learning Groups. *Journal of Educational Psychology*, 77(1), 60-66.

“Team Fracking” – The Unintended Consequences of Bullying Within Work Teams

Creasy, Todd
Department of Economics, Management, and Project Management
College of Business
Western Carolina University
Cullowhee, NC 28723
rtcreasy@wcu.edu
615-476-5706 (Contact Author)

Carnes, Andrew
Department of Economics, Management, and Project Management
College of Business
Western Carolina University
Cullowhee, NC 28723
amcarnes@email.wcu.edu
828-227-3544

Key words: Bullying, Teams, Conflict

Introduction

This qualitative study aims to address the effect of bullying tactics on behavior and perceptions of team-level and team member dynamics in virtual versus collocated project teams.-

Literature Overview

This study builds on the work of Creasy and Carnes (2017) where it was postulated that bullying could damage team dynamics. Workplace bullying is defined as “...harassing, offending, socially excluding someone, or negatively affecting someone’s work tasks” (Einarsen, Hoel, Zapf, & Cooper, 2003, p. 15). In addition, these acts must occur repeatedly and constitute systematic negative social acts to be considered workplace bullying (Einarsen et al., 2003; Einarsen, Skogstad, Rorvik, Lande, & Nielsen, 2016). *Bullying is operationalized when an individual is subject to repeated negative social acts that places the target in an inferior position. This may occur in a group setting or in one-on-one situations. Aquino and Thau (2009) further elaborated on “bullying” and described it didactically as, “...from open verbal or physical attacks, to rather indirect and subtle acts of aggression, such as excluding the person from his or her group, or talking behind his or her back. These behaviors may be intentional or unintentional...”*

Bullying can have a negative effect on various dyadic work exchanges to include employee-organization relationships and mentoring. Psychological contract metaphor (Rousseau, 1989) defined this psychological contract as “an individual’s belief regarding the terms and conditions of a reciprocal exchange agreement between the focus person and another party” (p. 123). Bullying it is postulated shatters this “belief” of reciprocal exchange. Since employees and organizations define their reciprocal obligations and entitlements as “the deal” (McLean, Parks, Kidder & Gallagher, 1998), bullying confuses this understanding by introducing phenomena not originally foreseen by the (most often) lower-level employee. Finally the role of reciprocity (Sparrowe and Liden, 1997) was defined as “immediacy of returns”, “equivalence of returns” and “interest”. Bully further confuses employees’ mental constructs as they struggle to answer the “Why?” question when presented with such adversarial managerial behavior. Mentoring (Young nad Perrese 2000) suggested that the mentoring process is a dyadic exchange/process relationship through which the mentor and protégé exchange information, knowledge, support and resources. Bullying not only hinders the willingness to exchange by the victim but we suggest could also lead to feelings of exploitation if the relationship becomes one-directional.

It is posited that bullying will negatively impact organizational (affective) commitment; organizational citizenship behaviors; can lead to work-family conflict; can insinuate perceptions of organizational politics reduce team learning and team innovation.

Affective commitment refers to “...the employee’s attachment to, identification with and involvement in the organization. Employees with a strong affective commitment continue employment with the organization because they want to do so” (Meyer & Allen, 1991, p. 67). A formal definition of OCB used in this study was, “... individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and in the aggregate promotes the efficient and effective functioning of the organization” (Organ, 1988, p. 4) Work-family conflict occurs when work-related demands impact family obligations that detrimentally impact the relationship between the employee and his or her family members (Matthews, Bulger, & Barnes-Farrell, 2010).

Team learning behavior differs from “shared learning orientation” or “team climate” in that it does not concern itself with the group’s beliefs (Bunderson & Sutcliffe, 2003) but the method or process by which team members resolve problems. Team innovation refers to the presentation or application of new concepts, processes, products, or procedures that are intended to improve the team or the organization as a whole (West & Farr, 1990; De Dreu & West, 2001).

Methodology

The methodology utilized was qualitative in nature. Twenty-nine project managers were interviewed with a sample size of twenty males with the average tenure as a project manager at slightly more than 5 years. Multiple industries were represented. Each interview lasted approximately 50 minutes (range 36 minutes to 1 hour 15 minutes). The interviews was recorded and transcribed. Each interviewee was asked two sets of 14 questions each regarding their experiences with bullying. The first set dealt with their experience as the “victim” of bullying and the second set dealt with their experience as an “observer” of bullying. The transcribed interviews were then coded for themes and similarities.

Results and Implications

The results of the study were as follows:

- Affective commitment to the team and organizational as well organizational citizenship behaviors were significantly reduced for many respondents. Many stated that they wanted off the team and/or didn't want to work with that group again.
- In the vast majority of cases, projects experiencing bullying resulted in failed important PM outcomes such as budget (too costly), schedule (late-delivery) and some experienced failure to meet customer specifications.
- Team learning and team innovation suffered in most teams due to the presence of bullying
- Unexpected outcomes:
 - Team-fracking – teams broke down around team-fault lines because of bullying; team members rallied around the bully or the victim of the bully
 - Politicization – team members began to vie for the attention of the authority and elevate themselves at the expense of the bully-victim; they became “opportunists”
 - More than one-half of those interviewed could easily identify when they were bullied, but could not name a single incident of seeing others bullied even though they were long-time project managers; they appeared to be “blind” to others plight

Future implications of this study are tremendous. Organizations need to understand the phenomena of team and organizational bullying and seek to reduce it for their project's sake, team members' morale and strategic execution.

Conclusion

The impact of bullying is significant. While many may consider workplace bullying to be a rare occurrence, empirical research has shown that approximately 50% of Americans have experienced workplace bullying (Lutgen-Sandvik, Tracy, & Alberts, 2007). Corporations and organizations would do well to seek pre-emptive methods to stave off bullying before such behavior impairs strategically important initiatives and/or demotivates key internal stakeholders.

Organizational change has been found to cause an increase in bullying behaviors (Hoel, Zaph & Cooper, 2002). Increased workload, autocratic leadership and job insecurity brought about through organizational change have been theorized as causing bullying behaviors. (Baillien, Neyens, De Witte, & De Cuyper, 2009;). Recruiting has also been found to be associated with bullying behaviors. Peterson (2014) suggested that “.the CEO is the management template for the rest of the company” (p.79). He asserts that the model which supports or reduces the level of bullying in an organization begins when the CEO recruits his/her top team. Using the example of Coca-Cola from 1966 until 1980, he strongly suggests the proclivity for bullying cascades down through the

entire organization. Considering such, organizational tumult and senior management recruitment may play a significant role in initiating bullying behaviors.

References

- Baillien, E., Neyens, I., De Witte, H., & De Cuyper, N. (2009). A qualitative study on the development of workplace bullying: Towards a three way model. *Journal of Community & Applied Social Psychology*, 19(1), 1-16.
- Bunderson, J. S., & Sutcliffe, K. M. (2003). Management team learning orientation and business unit performance. *Journal of Applied Psychology*, 88(3), 552.
- Creasy, T and Carnes, A. (2017). The Effects of Workplace Bullying on Team Learning, Innovation and Project Success as Mediated Through Virtual and Traditional Team Dynamics. *International Journal of Project Management*, 35 (6), 964.
- De Dreu, C. K., & Weingart, L. R. (2003). Task versus relationship conflict, team performance, and team member satisfaction: a meta-analysis. *Journal of Applied Psychology*, 88(4), 741.
- Einarsen, S., Hoel, H., Zapf, D., & Cooper, C. L. (2003). The concept of bullying at work. In S. Einarsen (Ed.), *Bullying and emotional abuse in the workplace: International perspectives in research and practice*. (pp. 3-30). London: Taylor and Francis.
- Einarsen, S., Skogstad, A., Rorvik, E., Lande, A., & Nielsen, M. B. (in press). Climate for conflict management, exposure to workplace bullying, and work engagement: A moderated mediation analysis. *The International Journal of Human Resource Management*,
- Hoel, H., Zapf, D., & Cooper, C. L. (2002). Workplace bullying and stress. In *Historical and current perspectives on stress and health* (pp. 293-333). Emerald Group Publishing Limited.
- Lutgen-Sandvik, P., Tracy, S. J., & Alberts, J. K. (2007). Burned by bullying in the American workplace: Prevalence, perception, degree, and impact. *Journal of Management Studies*, 44, 837-862.
- Matthews, R. A., Bulger, C. A., & Barnes-Farrell, J. L. (2010). Work social supports, role stressors, and work-family conflict: The moderating effect of age. *Journal of Vocational Behavior*, 76(1), 78-90
- McLean Parks, J., Kidder, D. L., & Gallagher, D. G. (1998). Fitting square pegs into round holes: Mapping the domain of contingent work arrangements onto the psychological contract. *Journal of organizational behavior*, 19(S1), 697-730.
- Meyer, J. P., & Allen, N. J. (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review*, 1(1), 61-89.

Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome*. Lexington Books/DC Heath and Com.

Rousseau, D. M. (1989). Psychological and implied contracts in organizations. *Employee responsibilities and rights journal*, 2(2), 121-139.

Sparrowe, R. T., & Liden, R. C. (1997). Process and structure in leader-member exchange. *Academy of management Review*, 22(2), 522-552.

West, M. A., & Farr, J. L. (1990). Innovation at work. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies* (pp. 3-13). Chichester, United Kingdom: Wiley

Technology Transfer Policy Efficiency: The Influence of Diversity and Inclusion

Emery, Dan E.
Center for Analytics Research & Education
Walker College of Business
Appalachian State University
Boone, NC 28608
emeryde@appstate.edu

King, Austin K.
Center for Analytics Research & Education
Walker College of Business
Appalachian State University
Boone, NC 28608
kingak3@appstate.edu

Meyer, Kolbert A.
Center for Analytics Research & Education
Walker College of Business
Appalachian State University
Boone, NC 28608
meyerka2@appstate.edu

Hadley, Brandy E.
Department of Finance, Banking & Insurance
Center for Analytics Research & Education
Walker College of Business
Appalachian State University
3066 Peacock Hall
Boone, NC 28608
hadleybe@appstate.edu
828.262.6938 (Contact Author)

Key words: Technology transfer efficiency, intellectual property, commercialization, diversity, LGBTQ friendliness

Introduction

University Technology Transfer Offices (TTOs) have attracted increased interest from researchers focusing on their economic impact and performance. Supporting this trend, the Association for

University Technology Officers (2017) has reported that academic technology transfer commercialization has contributed \$591 billion to the U.S. gross domestic product between 1996 and 2015. In addition, successful commercialization of an innovation provides universities with many benefits including improved reputation (Lee & Stuen, 2016), increased revenues enabling further investment in research (Rasmussen & Wright, 2015), greater faculty retention rates (Auster, 2002), stimulation of the local and larger economy (Audretsch, Lehmann, & Wright, 2016), and innovation in the student learning environment (Saukkonen, Nukari, Ballard, & Levie, 2016). We continue the literature as we focus on TTO efficiency in the sense of turning inputs into outputs. Specifically, we scale Technology Transfer Income by University Research Expenditures. This measure lets us compare how efficient a university is at converting research efforts into commercial income and allows for evaluation of the characteristics of successful smaller schools. Using this measure, we aim to identify the factors associated with diversity that might be altered to improve TTO efficiency.

Although previously unexamined in the Technology Transfer literature, diversity in the workplace has received significant attention in the Management literature. Increased diversity and inclusion have been linked with greater openness, less discrimination, and increased innovation and creativity (Ostergaard, Timmermans, & Kristinsson, 2011; Badgett, Durso, Kastanis, & Christy, 2013). The identified relation between diversity and innovation motivates our study of the impacts of diversity on Technology Transfer Office efficiency. We use university demographics as well as the Campus Pride Index (www.campusprideindex.com) to proxy for diversity and inclusion. We utilize an augmented sample of 126 universities with Association of University Technology Managers (AUTM) data for the period of 2011 – 2015 for our analysis.

We find that the most efficient university Technology Transfer Offices are associated with significantly different university demographic variables indicative of greater diversity and LGBTQ friendliness. Our results provide support for the environmental effects that impact university Technology Transfer Office efficiency but they also point to policy changes that can be made to increase performance. Specifically, universities may be able to improve TTO efficiency through greater acceptance of broader populations and increased diversity initiatives. When a more open and accepting university culture is prioritized, a TTO also may benefit through increased innovation and efficiency.

Literature Overview

There is significant literature on the performance of Technology Transfer Offices. Historically, performance has been measured by outcome variables including university patents, licensing revenue, the number of licenses, the number of start-ups, and the number of IPO firms to which a license had been issued (Foltz, Barham, & Kim, 2000; Carlsson & Fridh, 2003; Friedman & Silberman, 2003; Siegel, Waldman, & Link, 2003; Lach & Schankerman, 2004; Link & Siegel, 2005; Powers & McDougall, 2005). In addition, a composite measure has been developed that includes the number of invention disclosures received, the number of U.S. patents filed, the number of licenses/options executed, the number of licenses/options yielding income, the number of start-up companies, and the licensing income received (Rogers, Yin, & Hoffmann, 2000). We supplement the literature by focusing on a scaled outcome measure of efficiency to allow for

further analysis of smaller universities who are converting their research inputs into commercial income at an exceptional rate.

The literature has argued that static environmental and institutional factors have the most explanatory power for Technology Transfer Office performance (Siegel et al., 2003; Chapple, Lockett, Siegel, & Wright, 2005). Factors that have been shown to be significant are the entrepreneurial climate (Friedman & Silberman, 2003; Powers & McDougall, 2005), the presence of a medical school (Powers, 2003), the size and age of the TTO (Foltz et al, 2000; Rogers et al., 2000; Thursby, Jensen, & Thursby, 2001; Carlsson & Fridh, 2003; Thursby & Kemp, 2002), and institutional resources (O'shea, Allen, Chevalier, & Roche, 2005). Subsequently, the discussion on the impact of modifiable policy variables began with Siegel, et al. (2003). While they also found that environmental and institutional factors had significant explanatory power, they concluded that organizational policies were likely to be an additional determinant of TTO performance. Building on this, Siegel et al. (2004) proposed that universities should work to design flexible university policies to facilitate technology transfer. We add to the literature by further exploring adaptable university cultures related to diversity and inclusivity measures.

Our analysis of the impact of university diversity and inclusion culture on Technology Transfer Office efficiency is motivated by the management literature in which greater commitment to diversity and LGBTQ inclusivity have been linked with increased innovation and openness (Ostergaard, Timmermans, & Kristinsson, 2011; Badgett, Durso, Kastanis, & Christy, 2013). In particular, studies have shown that diverse groups of individuals are typically better at developing creative solutions to problems (Phillips, 2014). Others have argued that it isn't solely the presence of diversity that creates a creative and innovative workplace; instead, a workplace is enriched when there is a commitment to inclusive policies (Cunningham, 2011; Badgett et al., 2013; Mayer, Warr, & Zhao, 2016). We extend the literature on diversity and inclusion to examine their relation with university Technology Transfer Office efficiency, where innovation and openness to novel ideas is paramount.

Methodology

We utilize the Association of University Technology Managers (AUTM) database for the years 2011 – 2015 for our analysis. AUTM is an organization comprised of over 3,200 members that represent over 300 learning institutions and businesses that manage intellectual property. The data is collected by AUTM on an annual basis through a survey of its members. We restrict the sample to those universities who respond in 2015 and at least two other survey years covered in the sample period. When the sample is restricted to observations with complete data, 126 universities remain.

Our variables of interest are related to ethnic diversity and LGBTQ inclusivity. University student body ethnicity demographic variables are collected from www.startclass.com where percentages are provided for nine ethnic groups. In addition, we supplement the university's demographics with the Campus Pride Index measure of university LGBTQ Friendliness. The Campus Pride Index is a university survey that includes over 50 self-assessment questions that were developed and tested in 2001 in consultation with LGBTQ researchers. The questions correspond to eight factors which include LGBTQ Policy Inclusion, LGBTQ Support & Institutional Commitment, LGBTQ Academic Life, LGBTQ Student Life, LGBTQ Housing, LGBTQ Campus Safety, LGBTQ

Counseling & Health, and LGBTQ Recruitment and Retention Efforts. Questions are weighted so that each of the eight factors are equally weighted to provide a LGBTQ friendliness score between 0 and 5 stars in half star increments. These scores are then converted to an 100 point scale. If a LGBTQ Friendliness score was not available, the score was imputed with the Human Rights Campaign Congressional Scorecard for the university’s Congressional district’s voting record.

In order to provide univariate analysis of a university’s diversity, the ethnic profile of each university was condensed into a single variable. This was done by summing the percentage of all non-white ethnic groups. This represents the total percentage of minorities in the student body. This new variable is labelled diversity.

For our analysis, our target variable is TTO efficiency measured as Technology Transfer Income scaled by University Total Research Expenditures measured over a five year period to smooth out temporal variance. Specifically, we use the university's five year average gross licensing income divided by the University's five year average of total research expenditures. This allows us to evaluate how effectively a university converts research efforts into commercial income. In addition, this measure enables us to identify the policy factors that facilitate smaller schools to “hit above their weight” in terms of turning research into revenue. Universities in the sample are ranked by TTO efficiency and then grouped into quintiles where Tier 1 universities are the most efficient and Tier 5 universities are the least efficient as shown in the appendix. These quintiles are then compared among the dimensions previously identified.

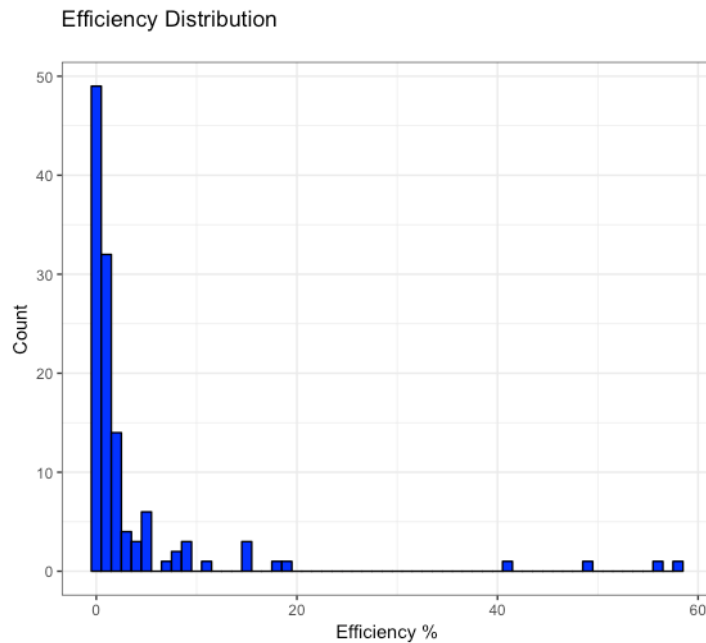


Figure 1. TTO Efficiency Distribution

Figure 1 displays the distribution of TTO efficiency. We can see that extreme outliers exist in the dataset and most universities have an efficiency near 0%. To account for this, the distribution was converted to a log scale (Figure 2).

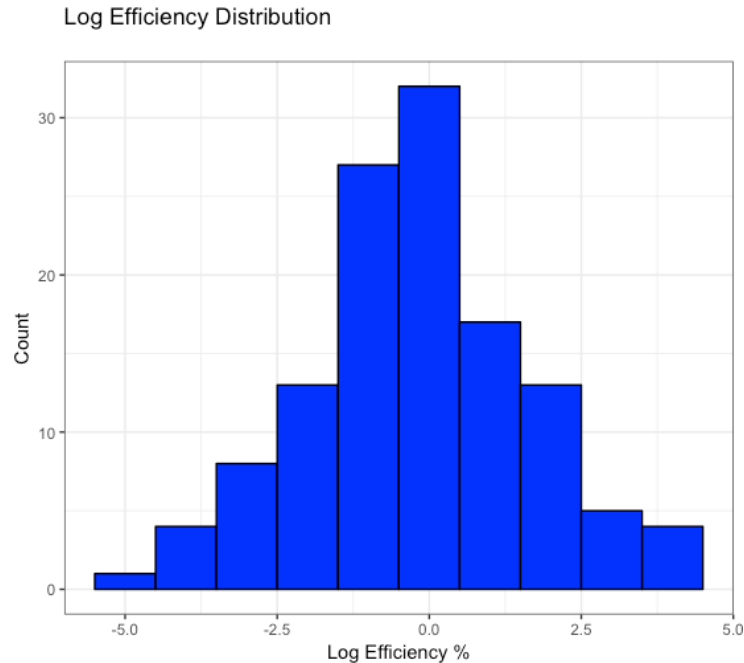


Figure 2. Log TTO Efficiency Distribution

Results and Implications

Figure 3 indicates that a positive correlation exist between the sum of minority student percentages and the log value of technology transfer efficiency. The correlation coefficient is 0.03791 and the relationship is significant ($p < .001$).

Figure 4 indicates that a positive correlation exist between the LGBT Rights variable and the log value of technology transfer efficiency. The correlation coefficient is 0.0125 and the relationship is significant ($p < .01$)

Table 1 explores the university's diversity through its Ethnic Profile and LGBTQ Friendliness Score by tier of Technology Transfer Office efficiency where universities in Tier 1 are the most efficient at turning research inputs into commercialized outputs. First in the ethnic profile, we observe greater portions of Foreign and Asian students at universities in the top tier of Technology Transfer Office efficiency and smallest portions in the lowest tiers of TTO efficiency. Similarly, there are smaller portions of White and African American students at TTO top tier universities and greater portions at lower tier universities. Interestingly, top tier universities in TTO efficiency are ranked the friendliest to the LGBTQ community, according to CampusPrideIndex.com, while those ranked the lowest in TTO efficiency are also ranked the lowest in LGBTQ friendliness. Combined, these results illustrate a strong correlation between greater overall university population diversity and inclusivity with TTO efficiency.

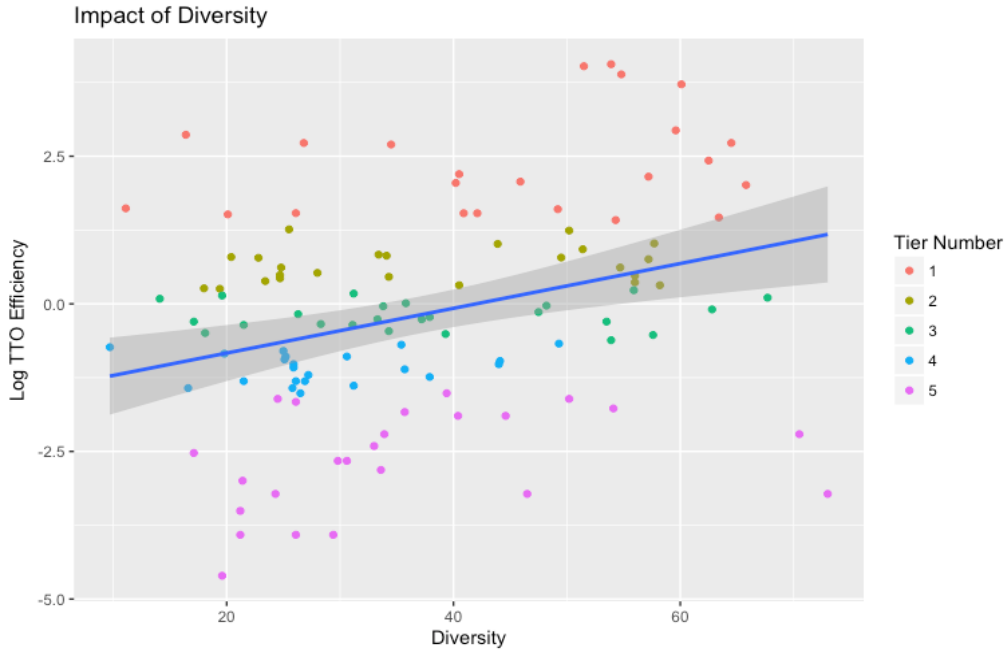


Figure 3. Diversity Metric Vs. Log TTO Efficiency

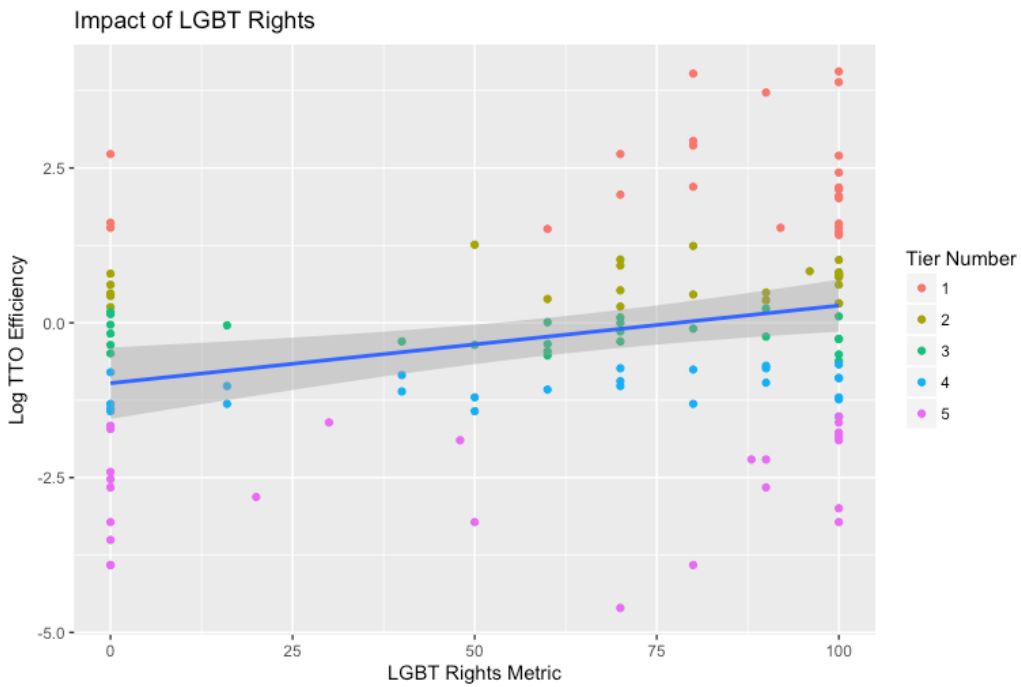


Figure 4. LGBT Rights Metric Vs. Log TTO Efficiency

	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Pop Avg
Foreign Students	13.0%*	9.1%	8.6%	5.3%*	5.4%*	8.3%
White Students	54.7%*	62.1%	62.3%	71.1%*	64.7%	62.9%
Two or More Races	1.6%	0.8%	0.6%	0.8%	0.6%	0.9%
Hispanic Students	6.7%	5.2%	6.0%	5.3%	5.0%	5.7%
Asian Students	10.5%*	8.6%	6.1%	4.1%	8.5%	7.6%
Unknown Race	7.7%	7.9%	8.1%	4.7%*	5.3%	6.7%
Native Amer or Alaskan	0.4%*	0.6%	0.6%	0.8%	1.1%	0.7%
African American	5.2%*	5.7%*	7.7%	8.0%	9.7%	7.3%
LGBTQ Friendliness	79.3*	69.0	55.4	60.5	50.6	62.8

Table 1. University Diversity Profile
(5% significance in difference from population in extreme tiers denoted with *)

Conclusion

Our study helps to identify diversity factors correlated with university Technology Transfer Office efficiency, measured as the ability to convert research expenditures into commercial income. We observe a strong correlation between diversity and inclusiveness with university TTO efficiency. We conclude that universities can breed effectiveness by making diversity a priority. Specifically, universities can foster greater TTO success through diversity measures that facilitate inclusive environments for diverse populations, including minority ethnicities and the LGBTQ community, to encourage greater acceptance, creativity, and innovation.

References

- Audretsch, D., Lehmann, E., & Wright, M. (2014). Technology Transfer in a Global Economy. *Journal of Technology Transfer*, 301(12), 301-312.
- Auster, B. (2002). The Lure of Industry. *American Society for Engineering Education Prism*, 12(4), 36-39.

Association of University Technology Officers. (2017). Driving the Innovation Economy. <http://www.autm.net/AUTMMain/media/SurveyReportsPDF/AUTM-FY2016-Infographic-WEB.pdf>

Badgett, M. V., Durso, L. E., Mallory, C., & Kastanis, A. (2013). The business impact of LGBT-supportive workplace policies.

Carlsson, B., & Fridh, A. C. (2003). Technology transfer in United States universities: a survey and statistical analysis. *Change, transformation and development*. Heidelberg: Physica-Verlag, 379-412.

Chapple, W., Lockett, A., Siegel, D., & Wright, M. (2005). Assessing the relative performance of UK university technology transfer offices: parametric and non-parametric evidence. *Research Policy*, 34(3), 369-384.

Cunningham, G. B. (2011). Creative work environments in sport organizations: The influence of sexual orientation diversity and commitment to diversity. *Journal of Homosexuality*, 58(8), 1041-1057.

Foltz, J., Barham, B., & Kim, K. (2000). Universities and agricultural biotechnology patent production. *Agribusiness*, 16(1), 82-95.

Friedman, J., & Silberman, J. (2003). University technology transfer: do incentives, management, and location matter? *The Journal of Technology Transfer*, 28(1), 17-30.

Lach, S., & Schankerman, M. (2004). Royalty sharing and technology licensing in universities. *Journal of the European Economic Association*, 2(2-3), 252-264.

Lee, J., & Stuen, E. (2016). University Reputation and Technology Commercialization: Evidence from Nanoscale Science. *The Journal of Technology Transfer*, 41(3), 586-624.

Link, A. N., & Siegel, D. S. (2005). Generating science-based growth: An econometric analysis of the impact of organizational incentives on university–industry technology transfer. *European Journal of Finance*, 11(3), 169-181.

Mayer, R. C., Warr, R. S., & Zhao, J. (2016). Does employee treatment and workforce diversity impact corporate innovative efficiency? SSRN Working Paper #2476543.

O'shea, R. P., Allen, T. J., Chevalier, A., & Roche, F. (2005). Entrepreneurial orientation, technology transfer and spinoff performance of US universities. *Research Policy*, 34(7), 994-1009.

Østergaard, C. R., Timmermans, B., & Kristinsson, K. (2011). Does a different view create something new? The effect of employee diversity on innovation. *Research Policy*, 40(3), 500-509.

Phillips, K. W. (2014). How Diversity Makes Us Stronger. www.scientificamerican.com. October 1, 2014.

- Powers, J. B. (2003). Commercializing academic research: Resource effects on performance of university technology transfer. *The Journal of Higher Education*, 74(1), 26-50.
- Powers, J. B., & McDougall, P. P. (2005). University start-up formation and technology licensing with firms that go public: a resource-based view of academic entrepreneurship. *Journal of Business Venturing*, 20(3), 291-311.
- Rasmussen, E., & Wright, M. (2015). How can Universities Facilitate Academic Spin-offs? An Entrepreneurial Competency Perspective. *Journal of Technology Transfer*, 781-799.
- Rogers, E. M., Yin, J., & Hoffmann, J. (2000). Assessing the effectiveness of technology transfer offices at US research universities. *The Journal of the Association of University Technology Managers*, 12(1), 47-80.
- Saukkonen, J., Nukari, J., Ballard S., & Levie, J. (2016). Start-Up Entrepreneurs and University Students in a Co-Learning Mode: Learning Effects of a Collaborative Entrepreneurial Coaching Programme. *Industry and Higher Education*, 30(3), 224-238.
- Siegel, D. S., Waldman, D., & Link, A. (2003). Assessing the impact of organizational practices on the relative productivity of university technology transfer offices: an exploratory study. *Research Policy*, 32(1), 27-48.
- Thursby, J. G., Jensen, R., & Thursby, M. C. (2001). Objectives, characteristics and outcomes of university licensing: A survey of major US universities. *The Journal of Technology Transfer*, 26(1-2), 59-72.
- Thursby, J. G., & Kemp, S. (2002). Growth and productive efficiency of university intellectual property licensing. *Research Policy*, 31(1), 109-124.

Appendix: List of Schools by Tier of Efficiency

Universities in the AUTM database with full data are ranked by efficiency (Technological Transfer Income scaled by University Total Research Expenditures) and sorted into quintiles. Those in Tier 1 represent the most efficient university TTOs.

Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Princeton University	Dartmouth College	University of Pittsburgh	University of Miami	Medical College of Wisconsin Research Fndtn
New York University	Brandeis University	North Dakota State University	University of Central Florida	Georgia Institution of Technology
Northwestern University	Tufts University	Texas A&M University System	East Carolina University	Penn State University
Columbia University	Louisiana State University System	University of Toledo	Rochester Institution of Technology	University of Delaware
Ohio University	Emory University	Oklahoma State University	University of Connecticut	Northern Illinois University
Rockefeller University	University of Missouri all campuses	University of Alabama in Huntsville	University of Mississippi	Drexel University
Mount Sinai School of Medicine of NYU	University of California System	Cornell University	Colorado State University	University of Northern Iowa
University of Utah	University of Illinois Chicago Urbana	University of Virginia Patent Fdn.	Auburn University	University of Arizona
University of Houston	Oregon State University	Brown University	Louisiana Tech University	Wayne State University

Stanford University	University of Nebraska	Johns Hopkins University	Utah State University	University of North Carolina Charlotte
University of Rochester	Iowa State University	Clemson University	Florida State University	Texas Tech University System
University of Oregon	Baylor College of Medicine	Rice University	Portland State University	Ohio State University
Loyola University of Chicago	Albert Einstein College of Med/ Yeshiva Unv	Purdue Research Fdn.	Arizona State University	University of Notre Dame
University of Washington/Wash . Res. Fdn.	University of Michigan	University of Kentucky Research Fdn.	University of North Carolina Chapel Hill	Colorado School of Mines
California Institute of Technology	University of Georgia	Stevens Institution of Technology	Virginia Tech Intellectual Properties Inc.	University of Cincinnati
University of Massachusetts	Temple University	Case Western Reserve University	University of Vermont	University of North Dakota
University of Florida	Southern Illinois University	The UAB Research Fdn.	University of Tennessee	University System of Maryland
Georgetown University	University of Chicago/UCTech	University of Southern California	University of South Carolina	New Jersey Institution of Technology
Massachusetts Institution of Technology (MIT)	Vanderbilt University	Boston University/Boston Medical Ctr.	Oregon Health & Science University	University of North Texas Health Science Ctr.
UW-Madison/WARF	Washington University of St. Louis	Michigan State University	University of New Hampshire	University of North Carolina at Greensboro

University of Pennsylvania	Harvard University	University of New Mexico/Sci. & Tech. Corp.	Lehigh University	Northern Arizona University
South Dakota State University	Rutgers The State University of NJ	University of Oklahoma All Campuses	Washington State University Research Fdn.	Mississippi State University
Duke University	University of Colorado	Virginia Commonwealth University	Medical University of South Carolina	University of Wisconsin at Milwaukee
University of Kansas	North Carolina State University	San Diego State University	University of Akron	University of Hawaii
Carnegie Mellon University	University of Arkansas for Medical Sciences	University of Iowa Research Fdn.	University of South Florida	Boise State University
Tulane University	The Catholic University of America	University of Arkansas Fayetteville	Michigan Technological University	Johns Hopkins University Applied Physics Lab
University of Minnesota	Kansas State University Research Fdn.	University of Louisville	Montana State University	Wright State University
				University of West Florida
				Duquesne University
				Salish Kootenai College

The Moderating Effects of Salespersons' Behaviors on Supplier Integration for New Product Development

Oh, Jae-Young
Department of Management, Marketing, and International Business
College of Business & Technology
Eastern Kentucky University
521 Lancaster Avenue
Richmond, KY 40475
jae-young.oh@eku.edu
859.622.7015

Key words: Supplier integration, behavioral constraints, salespersons, new product development, supplier performance

Introduction

Supplier integration (SI) for new product development (NPD) (i.e., early supplier involvement) suggests that inter-organization communications between traditional gatekeepers, such as purchasing and sales managers, are supplemented by those which occur between a buyer's engineers and a supplier's engineers. As direct interactions between engineers in a supplying firm with its buying firm increase, the gatekeeping role of salespersons in the supplying firm is diminished (Kull et al., 2013). Prior literature suggests that this, in turn, may motivate salespersons to adopt behaviors that protect their influence, but are detrimental to the performance of firms engaged in integration (Murtha et al., 2011). However, the literature fails to provide a clear understanding of the behavioral constraints of salespersons and how the traditional gatekeeper's behaviors affect SI.

Using survey data from 102 suppliers in the electronics industry, this paper answers the following research question: How would the behaviors of a salesperson moderate the relationship between SI and supplier performance?

Literature Overview

Prior literature has found many benefits of SI for NPD, such as better product design, enhanced product quality, reduced development time, and saved development costs (Johnsen, 2009; Primo & Amundson, 2002). For such benefits, buyers involve their suppliers at the different stages of the NPD process—idea generation, preliminary business/technical assessment, product concept development, product engineering and design, and prototype build/test/pilot/ramp-up for operations (Handfield et al., 1999). Wagner (2012) redefines them into two phases: Early

involvement (“Fuzzy front end” in his paper) that includes the stages from idea generation to product concept development, and late involvement (“NPD phase” in his paper) that includes the last two stages. The former phase is categorized as “non-routine and ill-defined processes, ad hoc decisions, high levels of dynamism, uncertainty, and equivocality” (p. 37), and where major communications between a buyer and supplier involve sharing of knowledge/expertise for idea generation, new product concept development, and its feasibility check. The later stage is defined as “more formal and better structured phase carried out with project management methods” (p. 37), in which the communications concern control and management to ensure all the processes are working as scheduled, and resolution of unexpected defects/errors with the supplier so that the buyer can launch the new product on time.

Gatekeepers are “key individuals who are strongly connected to internal colleagues and strongly linked to external domains” (Tushman and Katz, 1980, p. 1071). In traditional relationships, salespersons, as gatekeepers, manage and control all the information flowing from/to buying firms, and internally distribute refined information to relevant functions, such as engineering, in their organization (Van Den Berg et al. 2014). In a joint NPD, however, more communications between buying firm and engineers in supplying firm are increasingly required for successful product development and effective collaboration (Murtha et al., 2011; Salvador and Villena, 2013; Koufteros et al., 2007; McGinnis and Vallopra, 1999; Song and Thieme, 2009). This disintermediated communication weakens the traditional role of salespersons as sole gatekeepers, bringing about behavioral constraints in them by blocking the direct interaction (Kull et al., 2013). Such behavioral constraints are inevitable evils in inter-organizational collaborations, which must be avoided or managed for successful integration and the desired outcome acquisition (Fawcett et al., 2012).

According to sociotechnical system (STS) theory, a firm consists of two sub systems—the social system (e.g., attitudes, beliefs, norms, emotions, and so on) and the technical system (e.g., tools, practices, procedures, processes, and knowledge)—and failure to harmonize these two systems leads to undermined performance (Pasmore 1982). Since the social system operates and exists in the form of social agreements among individuals, a new technical system adoption without social consensus is likely to break the existing social agreements and cause resistance that, in turn, could diminish the benefits of the adopted technical system (Petersen et al., 2008). In other words, salespersons, who lose their traditional position of sole boundary spanners due to a new technical change (i.e., engineer’s early involvement in NPD), tend to express their resistance toward SI, which negatively affects SI outcomes. Specifically, a salesperson may show two behaviors toward SI. The first is the *internal barricading* that controls information sharing of his/her engineer with persons of his/her buyers. This barricading influences and controls the engineer’s information sharing, so that the engineer cannot directly share any information with buyers without the salesperson’s supervision. Second is the *external barricading* that blocks access of his/her buyers to engineers or information that engineers have. These barricading behaviors persuade buyers to ensure that all communications with the supplier must be routed through the salespersons. Thus, we frame the following hypotheses:

H1: When internal barricading is high, the positive effect of the timing of engineer involvement (early involvement) on supplier performance will be weaker than when internal barricading is low

H2: When external barricading is high, the positive effect of the timing of engineer involvement (early involvement) on supplier performance will be weaker than when internal barricading is low

Methodology

We collected survey response data from 102 (out of 150) direct material suppliers to a leading, global electronics manufacturer located in South Korea, and obtained matching supplier performance archival data from the manufacturer for each supplier participating in the study. Table 1 and 2 explain that our study secures convergent and discriminant validities, and Table 3 and Figure 1 show our findings through a hierarchical regression analysis.

	SuP	Rel	Dep	Exp	PI	TU	Timing	InB	ExB	Mean	SD
SuP	-									87.17	7.34
Rel	.031	-								10.14	5.93
Dep	.116	.066	-							29.43	29.67
Exp	-.175	.138	-.097	-						10.45	4.33
PI	.147	-.008	.226	.043	0.388					3.11	0.84
TU	.163	.025	.139	-.082	.406	0.322				3.84	0.71
Timing	.174	-.018	.034	-.187	.292	.361	-			3.11	1.39
InB	-.116	.015	.134	-.205	.018	.189	.046	0.25		3.52	0.61
ExB	.070	-.018	.112	-.160	-.060	.149	.143	.616	0.274	3.32	0.75

Notes: *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$; Value on the diagonal is the square-root of AVE; Rel = Relationship length; Dep = Supplier dependence; SuP = Supplier performance; Exp: Sales experience; PI: Product importance; TU= Technological uncertainty; Timing= Timing of engineer' involvement; InB= Internal barricading; ExB= External barricading

Table 1: Correlations, Means, and Standard Deviations

Results and Implications

Our results confirm H2. Figure 1 depicts the moderating effect of external barricading on the relationship between the timing of engineer involvement and supplier performance. For SI with high external barricading, the relationship between the timing of engineer involvement and supplier performance is negative, while it is positive for SI with low external barricading. Contrary to H1, however, our results argue that internal barricading, in fact, positively moderates the relationship between the timing of engineer involvement and supplier performance.

We believe that the contradictory results of the two barricading behaviors result due to the following reasons. First, the early stage of a buyer's NPD requires intensive communication between a buyer and a supplier's engineers with regard to sharing knowledge/expertise to generate ideas, developing a new product concept, and checking its feasibility. Thus, the external barricading—which is a salesperson's mediating action that physically blocks the direct interaction between a supplier's engineer and its buyer—limits the benefits of the engineer's early involvement in NPD process. On the contrary, internal barricading—which is a salesperson's moderating action that still allows information sharing but manages and controls its contents—positively moderates the effect of early engineer involvement on supplier performance. The early stage of NPD requires tacit knowledge to be intensively shared with the buyer. This subjects the supplier to a host of buyers requests that are unnecessary and uneconomical. Internal barricading

can filter out those requests and help the collaboration between the engineer and the buyer focus on economical projects.

For academicians, our results suggest that behavioral constraints may not always lead to negative firm-level outcomes. This also suggests that managers must have a nuanced view of internal and external barricading behaviors, lead inter-organizational integration efforts, and optimize firm performance.

Construct/Item	F.L.	S.E.	t
Product Importance (AVE=0.623, CR = 0.829, Source: Petersen et al. 2008)			
Much of the success or failure of the buying firm's products can be attributed to our products	.889	-	-
It would have been difficult for the buying firm to replace our products	.843	.114	8.169
The new product development of the buying firm would have suffered greatly without our products	.607	.102	6.174
Technological Uncertainty (AVE=0.568, CR = 0.787, Source: Ragatz et al. 2002)			
The technology involved in developing our product is complex	.520	-	-
The technology involved in developing out product is up-to-date	.985	.414	4.827
The technology involved in developing our product has been changed rapidly	.681	.234	5.092
External Barricading (AVE=0.524, CR = 0.811, New measures)			
We try to build personal relationships with the buying firm so that they feel more comfortable contacting us first when they have any problems or issues	.912	-	-
We let the buying firm know that salespersons are the final decision makers for any issues	.637	.122	6.589
We ask the buying firm to contact us through their purchasing	.623	.119	6.422
We ask the buying firm, if possible, to arrange meetings including us (salespersons)	.686	.113	7.167
Internal Barricading (AVE = 0.500, CR = 0.797, Murtha et al. 2011)			
We suggest to our engineers that they check with us before they call on the buying firm	.723	-	-
We explain to our engineers about what can be and cannot be discussed with the buying firm	.604	.124	5.481
We develop internal security measures to protect sensitive information so that it is not shared without our consent	.856	.132	7.018
We sit in the engineers' meetings as much as possible to monitor our engineers' conversation	.614	.108	5.579
Timing of Engineer Involvement (Source: Parker et al. 2008)			
Please indicate the First stage at which your engineer was involved in the buying firm's NPD effort*	-	-	-
Relationship Length			
Number of years that your firm has been supplying products to the buying firm	-	-	-
Supplier Dependence			
The approximate share (percentage) of the buyer's sales of your firm's annual sales	-	-	-
Sales Experience			
Number of years of experience as a salesperson	-	-	-

Notes: All t-values are significant at $p \leq 0.01$ level; Model fit: $\chi^2=85.173$, $df=71$, $p=0.120$; $\chi^2/df=1.200$; CFI=0.972; TLI=0.964; and RMSEA=0.044; Response scale: 1= strongly disagree; 5=strongly agree, except Relationship Length, Supplier Dependence, Sales Experience, and Timing; "F.L" denotes factor loadings;* Scale: 5-idea generation; 4- Preliminary business/technical assessment; 3- Product concept development; 2- Product engineering and design; 1- Prototype build, test, and pilot/Ramp-Up for operation

Table 2: Measurement items and CFA Analysis

Independent Variables	Model1	Model2	Model3	Model4	
	β	β	β	β	VIF
<i>Controls</i>					
Relationship length	.049	.049	0.64	.017	1.066
Supplier Dependence	.060	.066	.077	.148	1.171
Sales Experience	-.173*	-.156	-.205**	-.098	1.304
Product Importance	.101	.082	.102	.068	1.370
Technological Uncertainty	.099	.073	.114	.102	1.404
<i>Main Effects</i>					
Timing of Engineer Involvement (TEI)		.093	.044	.060	1.276
<i>Moderators Effects</i>					
Internal Barricading (IB)			-.407***	-.519***	1.915
External Barricading (EB)			.263**	.318**	1.811
<i>Interaction Effects</i>					
Timing X Internal Barricading				.358***	1.892
Timing X External Barricading				-.283**	1.819
<i>F</i>	1.438	1.314	2.451**	2.971***	
<i>R</i> ²	.070	.077	.174	.246	
ΔR^2	.070	.007	.097***	.072**	

Note: β is a standardized coefficient

Note: *** denotes $p \leq 0.01$, ** denotes $p \leq 0.05$, * denotes $p \leq 0.1$

Note: TEI, IB, and EB are mean-centered and used to create the interaction terms, following the procedure suggested by Aiken and West (1991)

Table 3: Hierarchical Regression Analysis

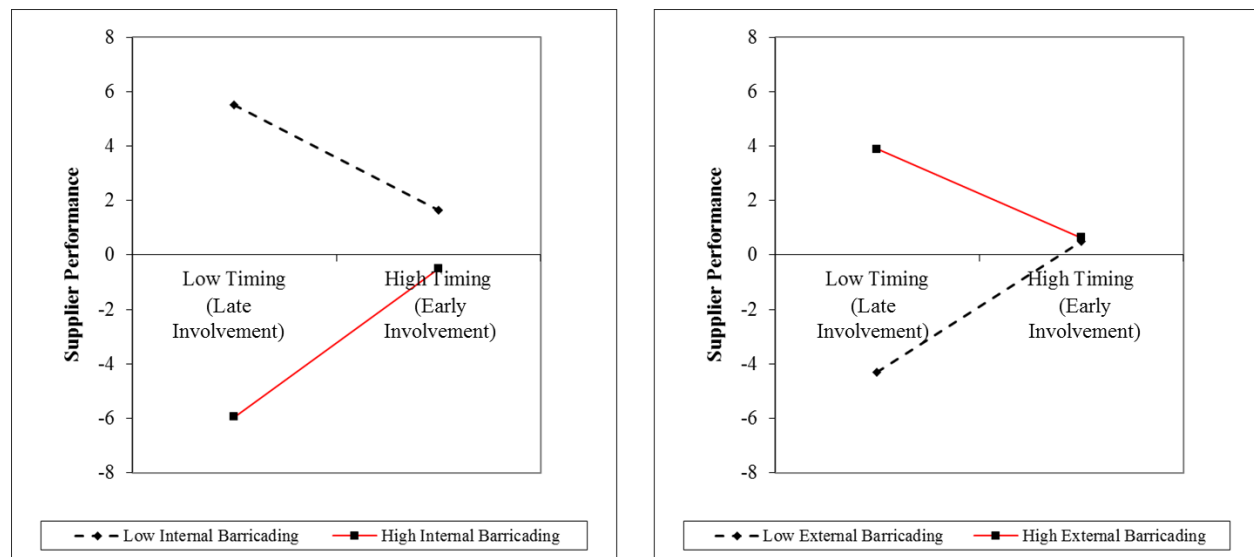


Figure 1 Interaction Plot with Moderator “Internal Barricading” and “External Barricading”

Conclusion

This paper has several issues that need to be addressed in the future research. First, the barricading behaviors in this study are measured by salespersons. The barricading behaviors measured by engineers may be different or may have different effects on supplier performance. Second, the samples are from South Korea. Collecting data from the US and comparing the results between the two datasets would facilitate an intercultural study about the barricading behaviors.

References

- Aiken, L.S., & West, S.G. (1991). *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage.
- Fawcett, S.E., Fawcett, A.M., Watson, B.J., & Magnan, G.M. (2012). Peeking Inside The Black Box: Toward An Understanding of Supply Chain Collaboration Dynamics. *Journal of Supply Chain Management* 48 (1), 44–72.
- Handfield, R. B., Ragatz, G. L., Petersen, K. J., & Monczka, R. M. (1999). Involving Suppliers in New Product Development. *California Management Review*, 42(1), 59–82.
- Johnsen, T. E. (2009). Supplier involvement in new product development and innovation: Taking stock and looking to the future. *Journal of Purchasing and Supply Management*, 15(3), 187–197.
- Koufteros, X., Cheng, T.C.E., & Lai, K.H. (2007). ‘Black-Box’ and ‘gray-Box’ Supplier Integration in Product Development: Antecedents, Consequences and the Moderating Role of Firm Size. *Journal of Operations Management* 25 (4), 847–70.
- Kull, T.J, Ellis, S.C., & Narasimhan, R. (2013). Reducing Behavioral Constraints to Supplier Integration: A Socio-Technical Systems Perspective.” *Journal of Supply Chain Management* 49 (1), 64–86.
- Mcginnis, M.A., & Vallopra, R.M. (1999). Purchasing and Supplier Involvement : Issues and Insights Regarding New Product Success. *Journal of Supply Chain Management* 35 (3), 4–15.
- Murtha, B. R., Challagalla, G., & Kohli, A.K. (2011). The Threat from Within: Account Managers’ Concern About Opportunism by Their Own Team Members. *Management Science* 57 (9), 1580–93.
- Parker, D.B., Zsidisin, G.A., & Ragatz, G.L. (2008). Timing and Extent of Supplier Integration in New Product Development: A Contingency Approach. *Journal of Supply Chain Management* 44(1), 71-83.
- Pasmore, William, Carole Francis, Jeffrey Haldeman, & Abraham Shani. (1982). Sociotechnical Systems: A North American Reflection on Empirical Studies of the Sevenths. *Human Relations* 35 (12), 1179–1204.
- Petersen, K.J, Handfield, R.B., Lawson, B., & Cousins, P.D. (2008). Buyer Dependency and Relational Capital Formation: The Mediating Effects of Socialization Processes and Supplier Integration. *Journal of Supply Chain Management* 44 (4), 53–65.
- Primo, M. A. M., & Amundson, S. D. (2002). An exploratory study of the effects of supplier relationships on new product development outcomes. *Journal of Operations Management*, 20(1), 33–52.

Ragatz, G. L., Handfield, R. B., & Petersen, K. J. (2002). Benefits associated with supplier integration into new product development under conditions of technology uncertainty. *Journal of business research*, 55(5), 389-400.

Salvador, F, and Villena, V.H. (2013). Supplier Integration and NPD Outcomes: Conditional Moderation Effects of Modular Design Competence. *Journal of Supply Chain Management* 49 (1), 87–113.

Song, M., & Thieme, J. (2009). The Role of Suppliers in Market Intelligence Gathering for Radical and Incremental Innovation. *Journal of Product Innovation Management* 26 (1), 43–57.

Tushman, M.L., & Katz, R. (1980). External Communication and Project Performance: An Investigation into the Role of Gatekeepers. *Management Science* 26 (11), 1071–85.

Wagner, S.M. (2012). Tapping Supplier Innovation. *Journal of Supply Chain Management* 48 (2), 37–52.

Your Learning Style May Explain Your Emotional Intelligence or Your Emotional Ineptitude

Moore, T. Winters
Department of Management and Marketing
College of Business and Technology
East Tennessee State University
Johnson City, TN 37614
mooretw@etsu.edu
423.439.4439

Key words: Emotional Intelligence, Individual Learning Style

Introduction

For over a decade management scholars and business people have shared an affinity for the concept of emotional intelligence. One reason for this affinity may be some of the facts purported about emotional intelligence (EQ) in some popular press books about the subject. For example, according to Bradberry and Greaves (2009), for every 1-point increase in an individual's EQ, there is an increase in annual income of approximately \$1,600 dollars. Belsten discusses how emotional intelligence is estimated to account towards upwards of 90% of an individual's performance (ISEI.com, 2016), while Bradberry and Greaves (2009) purport that 90% of high performers have high EQs (90 or above). Most EQ researchers agree that the average individual EQ is approximately 72 on a 100-point scale. Therefore, the vast majority of those individuals who's EQs were tested have a lot of room for improvement of their EQ skills. So, given that the average EQ is lackluster at best but it may account for significant differences in performance and salary, many questions arise as to why some individuals have a very high EQ without extensive training and others have a very low EQ. Bradberry and Greaves (2009) discuss how top management teams have the lowest average EQ of those they survey, while men score slightly lower than women, and older participants scored a little higher than younger participants. However, they offer no further explanation as to why high performers have higher EQs.

With the growing emphasis by industry to hire workers with advanced leadership and professional skills, understanding how individuals learn EQ is of paramount importance. While speaking to a Junior level business class, Lidia Davis, Manager of Organizational Development and Talent Management at Eastman Chemical Company, discussed how Eastman uses a variety of assessments to try to hire and develop people with leadership and professional skills. Livia stated that they were beginning to investigate Emotional Intelligence as a way to identify high potential candidates and further screen for them. She also discussed the need for a curriculum or training on EQ for current employees.

As a result, this study is a very timely study and can immediately impact industry but can also immediately impact business colleges and their students. The current study focuses on how EQ might be learned and what difference an individual's learning style might have on pre-training levels of EQ. If there is a significant relationship between a learning style and higher levels of emotional intelligence, then our understanding of why some people have much higher pre-training levels of EQ compared with others will be better understood. Also, insight into identifying high potentials is bolstered and teaching pedagogy can also be illuminated. Therefore, if business colleges can begin to train individuals on EQ and help them increase their skills, they might find that their graduating students are much more sought after than ever before. Thus, two research questions were developed:

Question 1; Is there a relationship between EQ and learning style?

Question 2: Are some learning styles better suited for learning EQ than others?

Literature Review

No previous research examining what might cause individuals to have differing EQ scores could be found. As a result, a research endeavor was begun to answer the questions around what may be the reason some individuals seem to naturally have a higher EQ than others. Thus, Moore, Snider, & Luchini (2012) examined this question and found a possible link to this phenomenon through their empirical research into personalities. They found a correlation between right-brained thinkers and higher EQ and also suggested that whole-brained thinkers may have an even higher EQ. The premise of this study was to ascertain the role that certain parts of an individual's Meyers-Briggs type, focusing on information processing and decision making, might play in learning EQ.

Therefore, a natural extension to this research is to examine how individuals learn EQ and if differences in how individuals learn play a role in higher EQ scores. A literature review was begun and previous research by Felder (1988) seemed to show promise. Felder (1988) created an assessment that measures several different unique learning styles that may provide some insight into how EQ is learned. Felder's assessment translates five key learning questions into four major learning preference categories. The questions are as follows:

1. What type of information do you preferentially perceive?
2. Through which sensory channel is external information most effectively perceived?
3. With which organization of information are you most comfortable?
4. How do you prefer to process information?
5. How do you progress toward understanding?

The five questions above are translated into four learning style categories: Active/Reflective, Sensing/Intuitive, Sequential/Global, and Visual/Verbal. Thus, there are 16 possible learning styles which also have previous theoretical and psychometric roots in personality theory, decision making, and social learning research.

To develop testable hypotheses a considerable amount of theoretical development weaving personality theory, decision making, and social learning together is needed. However, for the format of this particular research outlet (ARBS) there is not sufficient space to adequately address

this issue. Therefore, hypotheses were developed for each of the four categories of learning as follows:

Research Hypothesis 1: There is a significant difference in Total EQ between Active Learners and Reflective Learners.

Research Hypothesis 2: There is a significant difference in Total EQ between Intuitive Learners and Sensing Learners.

Research Hypothesis 3: There is a significant difference in Total EQ between Visual Learners and Verbal Learners.

Research Hypothesis 4: There is a significant difference in Total EQ between Global Learners and Sequential Learners.

Methodology

An electronic survey was distributed through the local chamber of commerce to generate data from several local companies and non-profit organizations. In addition, two graduate (MBA) leadership courses (one traditional and one executive) were also surveyed. The survey was comprised of a scale for emotional intelligence, individual learning style, some additional attitudinal data not included in this analysis, and some demographic data.

Upon cleaning the data and preparing it for analysis a total of 228 useable responses were available. Factor analysis was performed for all the scales, followed by a test for reliability. All scales were deemed acceptable for use. To test each hypothesis an independent sample T-Test was performed.

Results and Implications

The findings from the statistical analysis indicate that there is a significant difference in the Total EQ scores of certain categories of learners.

	ACT	REF	INT	SNS	VIS	VRB	GLO	SEQ
Mean	83.56	79.22	83.87	80.56	81.94	81.31	83.12	80.66
t Stat	4.17		3.09		0.48		2.34	
P(T<=t) two-tail	0.00		0.00		0.63		0.02	
t Critical two-tail	1.97		1.97		1.97		1.97	

Table 1. Independent Sample T-tests

Active learners had a higher Total EQ than Reflective learners, Intuitive learners had a higher Total EQ than Sensing learners, and Global learners had a higher Total EQ than Sequential learners. There was no significant difference in the Total EQ scores between Visual and Verbal learners. As a result, research hypotheses 1, 2, and 4 were supported while research hypothesis 3 was not supported.

There are 16 (2⁴) learning combinations possible with Felder's Individual Learning Style (four categories with two types of learning each). In the current study each category was tested to see if there was a difference in the two types of learning and Total EQ. Three of the four categories showed a statistical difference in the Total EQ of learners (Active, Intuitive, and Global). Therefore, two of the sixteen learning styles appear to be the overall strongest in relation to untrained Total EQ scores; those that show a preference towards Active, Intuitive, and Global learning.

After identifying the types of learning that are significant indicators of higher Total EQ, the next question is what makes these types especially good at learning EQ. For instance, Active learners put information they have learned into practice in the external world as opposed to Reflective learners who practice mental contemplation of new knowledge. Thus, Active learners may mimic others with high EQ, therefore displaying the behavior of high EQ individuals while learning.

According to Felder (1988, p. 676), an important distinction between intuitive learners and sensing learners is "intuitors are more comfortable with symbols than are sensors. Since words are symbols, translating them into what they represent comes naturally to intuitors and is a struggle for sensors". As a result, it is clear to see that Intuitive learners would naturally be better at choosing the best words to represent their feelings and the feelings of others during a dialogue compared with sensors. This ability is a main tenant of emotional intelligence.

After testing the learning types Global and Sequential, Global learners showed a statistically higher EQ than sequential learners. If these two types are examined closely in relation to emotional intelligence, it is clear to see that Global learners may come by higher EQ naturally due to their ability to learn things that are not presented in a logical or linear fashion. Thus, a main characteristic of high emotional intelligence is that each interaction with others is a unique one that calls for customized communication and behavior. In other words, human interaction is not a linear process that can be followed in a logical step-by-step process since each individual is different and brings diverse characteristics to each interaction.

Conclusion

Understanding the learning styles that are related to higher untrained EQ scores are important to colleges of business and industry alike. Business colleges can now help identify students with higher EQs, but more importantly, by knowing the learning styles that are not related to higher EQ scores Professors can begin to customize their teaching to help those students who naturally struggle with EQ to learn it. Industry can now use the Individual Learning Style assessment to quickly identify high EQ potentials and those who might struggle to learn EQ. Thus, businesses now have an easy way of screening for leadership potential and positions that can be empirically supported.

Another important finding of this research is the added support that it provides the notion of emotional intelligence as a diversity characteristic. Moore, Snider, and Luchini (2012) also found support for emotional intelligence as a characteristic of diversity found in one's personality traits. Other diversity characteristics such as gender and age have also been shown to be related to emotional intelligence (Belsten, 2016; Bradberry & Greaves 2009; Schutte et al., 1998). Since

current EEOC law and guidelines focus on not only traditional characteristics of diversity but now include non-traditional characteristics of diversity such as religion, gender identification, and sexual orientation (www.EEOC.Gov, 2018), emotional intelligence may be a needed additional category. This is in part because employees are given specific rights concerning their diversity characteristics and employers are mandated certain accommodations for those diversity characteristics. Thus, further research into the validity of emotional intelligence as diversity characteristic might be warranted.

References

Belsten, L. (2016) Institute for Social and Emotional Intelligence, ISEI.com

Bradberry, T. & Greaves, J. (2009) *Emotional Intelligence 2.0*. TalentSmart; San Diego, CA.

EEOC.gov

Felder, M. R. & Silverman, L. K. (1988) Learning and Teaching Styles in Engineering Education. *Engineering Education*, 78(7), 674-681.

Moore, T. W., Snider, J. B., & Luchini, M. (2012) Thinking Style and Emotional Intelligence: An Empirical Investigation. *Journal of Behavioral Studies in Business*, 5, September.

Schutte, N. S., Malouff, J. M., Hall, L. E., Haggerty, D. J., Cooper, J. T., Golden, C. J., & Dornheim, L. (1998) Development and validation of a measure of emotional intelligence. *Personality and Individual Differences*, 25, 167-177.