



A Global Framework for Understanding Cross Cultural Teaching Experiences Gained in Japan

Dr. Douglas Moore Schutz, Tokyo University of Science

Douglas M. Schutz is an Associate Professor of Information Systems, International Business, and Management at the Tokyo University of Science (TUS) in Japan. He received a Ph.D. in Business Administration focusing on Management Information Systems (MIS) from the Fox School of Business of Temple University at Philadelphia, an MBA in Information Management from the McCombs School of Business of the University of Texas at Austin, and a B.S. in Electrical Engineering from the United States Naval Academy at Annapolis focusing on digital electronics design. Doug was one of 40 Ph.D. students selected globally to present his research at the International Conference on Information Systems (ICIS) Doctoral Consortium in Shanghai, China. His research has been nominated Best Paper at the Hawaii International Conference on Systems Science (HICSS), and his work has been published three times in publications of the Japan Society of Information and Management (JSIM). He was recently selected to teach a one week intensive course to graduate students at the Regensburg University of Applied Sciences in Germany. Prior to academia, Doug worked as an IT manager and consultant in the electric utility industry out of New Orleans for two Fortune 500 companies, where his responsibilities included IT disaster recovery from Hurricane Katrina. Previously, he served as an unrestricted line officer in the U.S. Navy onboard a guided missile destroyer and the second Aegis enabled cruiser.

Prof. Dante Dionne, Korean Air

Dante Dionne is an Organizational Leadership PhD candidate and a Senior Innovation Technology Manager at Korean Air. The past 20+ years of his career has centered on management and professional services consulting. Where, he has specialized in leading multi-national project teams in the design and implementation of digital marketing, mobility and innovative technology solutions.

Dante holds an MA in Industrial/Organizational Psychology from the Chicago School of Professional Psychology and a BS in Business Management with a minor in Computer Science. Dante is an adjunct faculty member at the Chicago School of Professional Psychology with Graduate level teaching credits in Psychometrics, Data Management and as a Visiting Scholar at the University of Science in Tokyo. Dante's dissertation research spans several specializations in psychology including: Organizational, Social, Cultural, Developmental, Cognitive, Performance, Sports, and Positive Psychology. Dante is also an active member of American Psychological Association (APA) Division 46 (Society for Media Psychology and Technology), Division 14 (Society for Industrial and Organizational Psychology), Division 13 (Society of Consulting Psychology) and Division 47 (Society for Sport, Exercise and Performance Psychology).

Prof. Yong-Young Kim, Konkuk University

Yong-Young Kim is assistant professor of Division of Business Administration and Economics at Konkuk University in Korea. He earned his Master's and Doctoral Degree in Management Information Systems from Seoul National University in Korea. His research interests include Smart Work, online games, IT experiential learning processes, IT convergence & platform, and ubiquitous computing. His papers have appeared in Information Resources Management Journal, Cluster Computing, International Journal of Advanced Media and Communication, Asia Pacific Journal of Information Systems, and Journal of Korean OR/MS Society and also have been presented at many leading international conferences (ICIS, HICSS, PACIS).

A Global Framework for Understanding Cross Cultural Teaching Experiences Gained in Japan

Abstract

The two of the three largest economies in the world today, the U.S. and Japan, share common globalization challenges and opportunities, particularly in the area of engineering education. The globalization of engineering education calls for international educators who are able to gain a cross-cultural knowledge of their students, institutions, and countries. This is critical, because both Japan and the U.S. need to attract and develop larger numbers of engineering students with the technical skills for successfully innovating into the future as their populations increasingly age.

This paper provides best practices experienced from teaching in Japan in order to help address and learn from gaps between foreign cultures, so that teaching can be more motivational and effective for learning. This leads to the following research question:

How can engineering education in Japan benefit from cross cultural understanding?

This paper draws from the literature streams of knowledge sharing, social influence, and social psychology. From these streams, a theoretical framework is developed and applied to teaching and learning in Japan. Through this framework, best practices are developed that can be applied for greater cross cultural understanding for engineering education across borders. The framework can be applied to not only Japan, but to other countries for greater understanding for teaching and learning globally.

Introduction

Trends in globalization and demographics are leading to the call for international engineering educators who are able to gain a cross-cultural knowledge of their students, institutions, and host countries. This is important for not only developing countries, but also developed countries such as Japan and the U.S. whose demographic trends are yielding increasingly older populations. Globalization and innovation play key roles for both the U.S. and Japan. In addition to trade, both the U.S. and Japan have the largest foreign direct investment (FDI) outflows of all developed countries; they also now both use FDI income to help counter trade deficits [1].

Japan and the U.S. more than ever need to attract, motivate, and retain larger numbers of engineering students for developing innovations for global organizations. The organizational use of innovation leads to productivity gains which, in turn, leads to greater national economic prosperity [2]. This interpretive study presents and applies a framework for understanding best practices experienced in Japan so that engineering education across borders can be more successful [3].

We next present a literature review of knowledge sharing and social influence. Both of these streams of knowledge serve as the foundations of the dimensions of our theoretical framework. We then present our framework applied to teaching and learning in Japan compared to the U.S. The paper concludes with implications for engineering education in foreign cultures as well as recommendations for future research.

Knowledge Sharing for Learning

Knowledge is created and learned through socialization and internalization for active learning by the individual [4]. Through the lens of practice, the understanding of knowledge extends beyond development or delivery, and includes the consumption and shared participation between employees and managers as well as between students and professors [5].

Knowledge is information that has been personalized through meaningful relations which can be useful [6, 7]. Knowledge is created by combining elements that are previously unconnected, or by creating new ways for combining previously connected elements [8]. Hence, intellectual capital is cultivated by combining knowledge in new ways from different stakeholders of varying expertise and experiences [9]. Teachers and students exchange and recombine elements of knowledge with one another [7].

Organizations need employees to share knowledge with one another. Similarly, universities need professors and students alike to share and absorb each others knowledge in the classroom. Employees as well as students who do not frequently draw from others in similar situations run the risk of path dependency from the reinforcement of their own learning-by-doing [10-12].

In sum, knowledge sharing needs not only students listening to teachers, but also teachers listening to students, and students listening to other students. Incentives such as personal recognition can be used to encourage knowledge sharing [11]. However, while a larger number of knowledge contributors can be beneficial, the quality of the knowledge that is shared is more beneficial than the quantity [7, 13]. There can be diminishing returns with

teachers or students who just talk without listening. How much a student shares their knowledge in the classroom, is influenced by the balance between order and interaction based on the social psychology of the culture. This, in turn, is also impacted by the social influence of others in that culture which we next discuss.

Social Influence for Learning

In addition to knowledge sharing, social influence also serves as a key factor for learning and is also influenced by the cultures of countries. Students learn by the diffusion of knowledge through the observation of others [14]. Through observation, a student's beliefs and evaluations, based on the relative advantage and ability to learn new concepts, can have a positive influence on attitude for learning [15]. Informational influence also draws from the theory of social learning in that the individual learns how to use new systems from the experience of others, thus avoiding the opportunity costs of trying to learn on his or her own [16].

From social learning theory, human behavior is described as an ongoing interaction among cognitive, behavioral, and environmental factors [16]. One learns how to execute new behaviors by observing others, which enables individuals to model this information for their own subsequent actions [16]. At universities, students learn by observing and mimicking their professors as well as their fellow students. Similarly, employees in organizational teams mimic the successful, observed behaviors of others for finding expertise and coordinating knowledge with others [17]. Developing and sharing innovative ideas is mainly a reciprocal, social activity relying on the interactive linking of ideas between individuals and collective knowledge [18]. Learning would take much more effort if it was limited to one's own autonomous actions [16].

Individuals that both absorb and share content with others in the classroom are the most active learners. This is in contrast to students that just listen to lectures without sharing (i.e. lurkers) and those that just share information without listening (i.e. spammers). Those that neither listen nor share are "missing in action" and do not learn or contribute in the classroom [19]. In sum, there needs to be a balance of both listening and participating in classroom discussions.

Deutsch and Gerard [20] break down the social influence of group norm between the 1) normative influence and the 2) informational influence. Normative social influence is, "the influence to conform to the positive expectations of another", [20, p. 629]. Normative influence is the "pull" of the individual to conform to his or her perceptions of the wishes of others.

Informational influence, on the other hand, is "the influence to accept information obtained from another as evidence about reality" [20, p. 629]. In this situation, the user is influenced to use a new system by directly observing the benefits of information from the adoption and use of that system by others [20]. Informational influence is the self-driven "push" by the user to attain the same perceived informational benefits. From social information processing models, an actor's perceptions of the benefits of learning new information are shaped by the actor's social networks [21]. Positive communication about the use of a new information can positively influence an individual in the same social networks to learn [22]. Informational influence also draws from the theory of social learning in that the individual learns new

concepts from the experience of others, thus avoiding the opportunity costs of trying to learn on his or her own [16].

The potential added value from the social influence of network externalities of a user base of active participants from the business unit (or classroom) and overall organization (or engineering school) should further motivate users beyond normative and informational social influence. The social influence of the network externalities of others using smartphone platforms for the reciprocal seeking and sharing of knowledge through interpersonal interactions should, therefore, extend beyond unidirectional normative or informational influences. Hence, the social influence from network externalities and critical mass need to be considered in order to fully understand and take into account how and why individuals are motivated from the benefits of using smartphone platforms for exchanging knowledge.

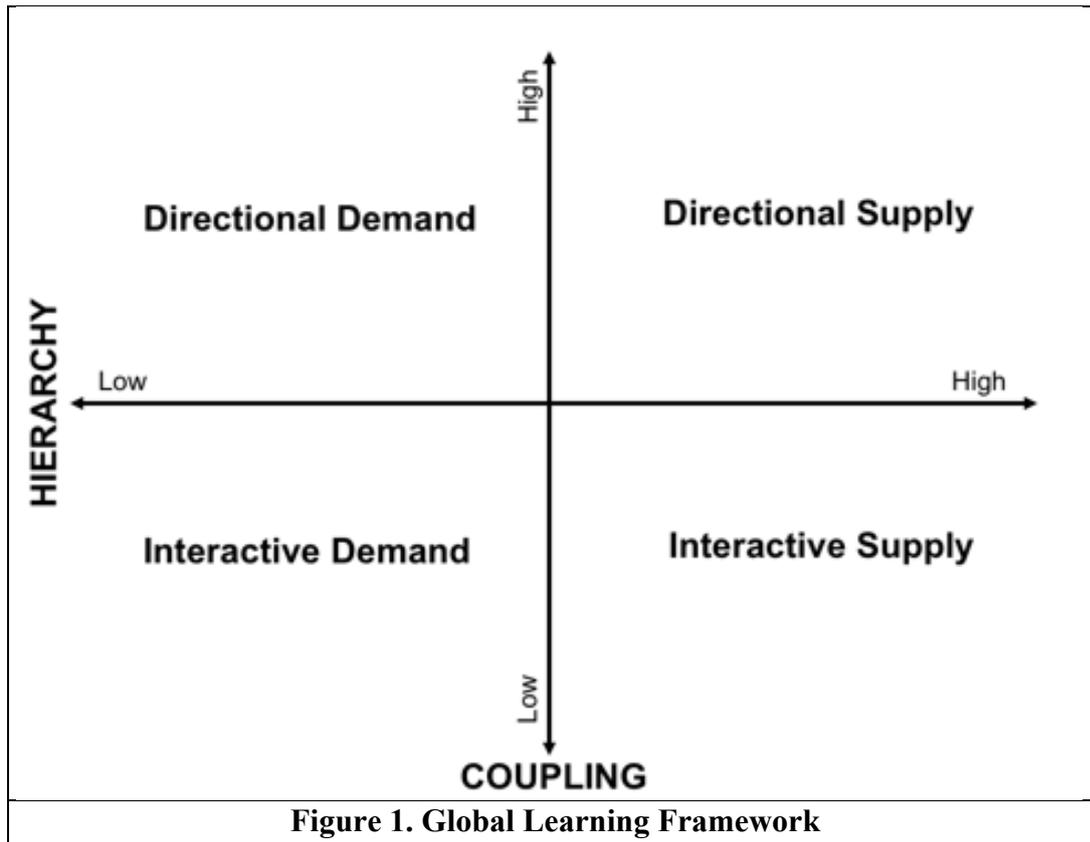
In sum, the social influence of network externalities and critical mass, therefore, provide a mechanism for taking into account the increased potential benefits that “spill over” to new users due to the increased size of the user base using the smartphone platform [22-24]. University students who are active learning are not just unidirectional consumers, they are also producers of their own content [19, 25]. Network externalities and critical mass extend beyond normative and informational social influence that is sequential, focusing on unidimensional use [20, 26, 27]. Network externalities and critical mass enable the understanding of social influence that is also reciprocal (i.e. in both directions), between the multiple dimensions of seeking and sharing and vice-versa, which, in turn, can quickly lead to greater benefits among the participants.

We next combine the concepts of knowledge sharing and social influence, taking into account social psychology from different cultures in developing our theoretical framework. By culture, we mean the unwritten norms and values that are mentally passed on to new group members [28].

Global Learning Framework Dimensions: Coupling and Hierarchy

We now extend the concepts of knowledge sharing and social influence with respect to two dimensions in our Global Learning Framework (Fig. 1): coupling and hierarchy. Coupling measures flexibility and adaptability, while hierarchy measures the the number of organizational levels and centralization [29]. The X-axis of the framework is coupling with respect to knowledge sharing. The Y-axis of the framework is hierarchy with respect to social influence. This framework enables the classifying of learning in countries based on organizational as well as cultural influences from social psychology.

Organizational structure can be mechanical or organic [30]. These variations in topology have been used for contingency predictions with the understanding that there is no one optimal way for firms to organize since internal and external environments vary and change [31]. The speed of learning within the organization has been traditionally viewed as spatial with respect to the size of the population and distance from its centers [14]. From social cognitive theory, individual behavior is influenced by personal cognitions impacted by social influences and structures of the environment [32]. Social structures are groups based on differentiated parameters of social relations, through interaction and communication, and hierarchical level [33].



Tightly coupled organizing and communicating occurs in groups with stronger norms, while loosely coupled groups are more flexible [29]. From social psychology of different cultures, we use masculinity, how achievement is viewed, for measuring the level of coupling in our framework [28]. In masculine societies with respect to education, the norm is the best student where failing is a disaster. In feminine societies, the norm is the average student where failing is not a major incident. In masculine societies, brilliant teachers are admired, while in feminine societies, friendly teachers are appreciated [28]. Hence, with respect to education, Japan has a higher level of masculinity compared to the U.S. Hence, Japan has tighter coupling for sharing a learning knowledge, while the U.S. has looser coupling.

Organizational topology can be centralized or decentralized [34]. The parameter centralization ranges from centralized to decentralized and describes how vertical in structure decision-making authority is spread in an organizational group [35]. In centralized groups, decision-making authority is concentrated vertically in higher hierarchical levels. Here, decision-making is top-down, following a “command and control” flow [36]. At universities, the traditional means for sharing knowledge has been the lecture style from professors down to students. This illustrates a top-down, one-way, hierarchical approach for delivering knowledge typically used at many Japanese universities.

In decentralized groups, decision authority is distributed horizontally at lower hierarchical levels across more autonomous employees having similar hierarchical levels in flatter topologies [35]. In student-centered pedagogy learning theory at many universities in the U.S., learning shifts from top-down to bottom-up. This can be particularly helpful at engineering schools where classes are being turned “upside-down” with peer-led team learning workshops. This active-learning approach has led to increased confidence, intellectual curiosity, and interest in teaching among students [37]. Through student-centered

learning, the individual student is responsible for setting learning goals, working towards them, monitoring feedback, and making appropriate adjustments [38]. We use power distance as our measure for hierarchy. Power distance is the emotional distance between employees and managers, or in our study students and professors [28]. Research shows that power distance in Japan is typically higher than that in the U.S.

Centralized and decentralized topologies, have their own strengths and weaknesses, with the former being more focused, and the latter being more broad [39]. Hierarchical levels have less vertical influence on each other in decentralized groups since there may be multiple and even conflicting goals between them [40]. Decentralized structures enable greater lateral communication and interaction conducive for adapting to innovations as a continuous process [41]. While decentralization can mean less integration and control within local processes, a stable equilibrium can be reached over time leading to greater overall integration and use of new IT tools at the organization-wide process level [42].

Since the authority for making decisions in centralized structures is concentrated towards the top, leaders are positioned “higher” in hierarchy in these structures [41]. Communication and interaction among employees in centralized topologies are typically vertical with tasks assigned via command and control from the top-down to functional specialists in lower hierarchical levels [30]. These hierarchical structures are able to achieve efficient processing through policies and goals that standardize information [43]. Decision-making contingency theories in the past have proposed that centralized decision making by a leader is more efficient, compared to decision making in decentralized structures among different team members by consensus [44].

As shown in Figure 1, the horizontal axis of the Hierarchy-Coupling (HC) Global Learning Framework is divided into loose (low) and tight (high) coupling. The vertical axis represents hierarchy divided into bottom-up (low) and top-down (high). Hence, the lower left quadrant has loose coupling with bottom-up hierarchy.

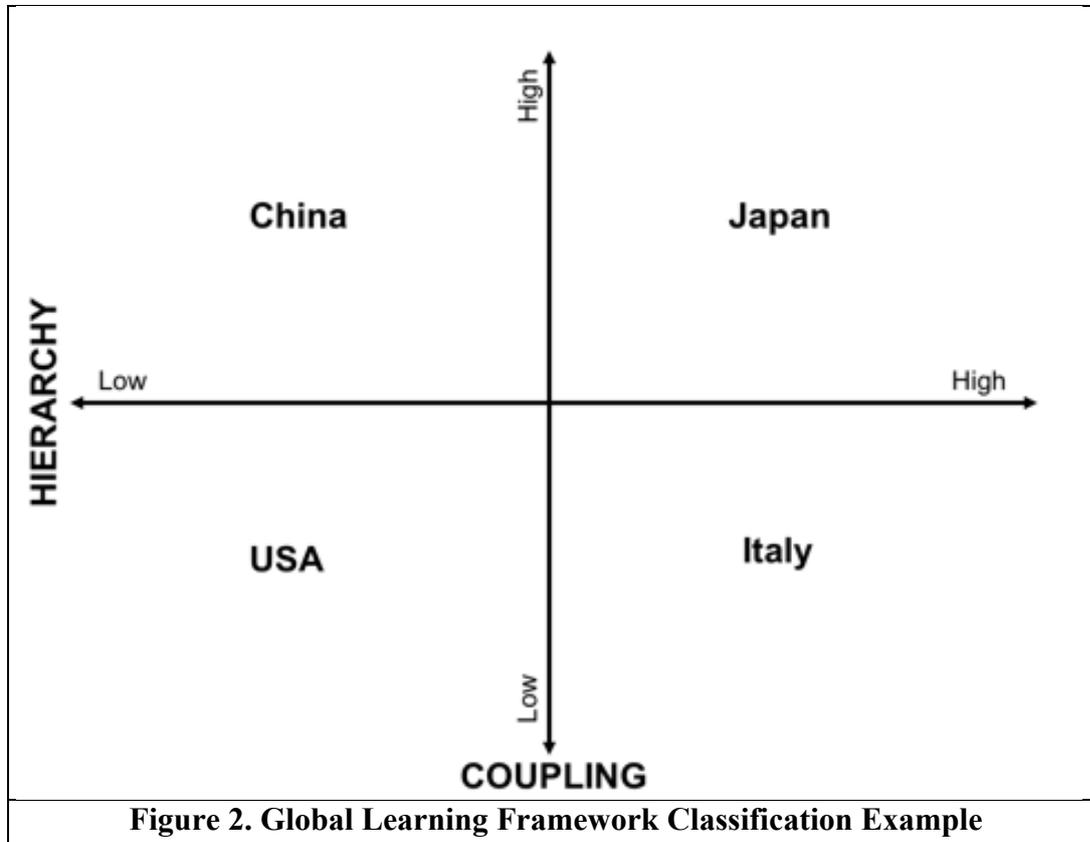
Through this framework and using the measures of power distance and masculinity for different countries, we introduce four different classification quadrants of global learning between professors and students with examples. These classifications are: 1) interactive demand for the lower left quadrant, 2) directional demand for the upper left quadrant, 3) directional supply for the upper right quadrant, and 4) interactive supply for the lower right quadrant.

Applying the Global Learning Framework for Classification

As an example illustrated in Figure 2, we classify the teaching and learning experience in the U.S. in the lower left quadrant based on measures of power distance and masculinity [28]. The upper left quadrant has loose coupling with top-down hierarchy. This is the quadrant where China is classified. The upper right quadrant has tight coupling with top-down hierarchy. Japan fits in this quadrant. Finally, the lower right quadrant has tight coupling with bottom-down hierarchy. This is where Italy is classified.

The U.S. tends to have an interactive demand learning environment where students are more likely to actively participate and friendly professors are more appreciated. China should tend to have a directional demand learning environment where knowledge mainly flows from professor to student and friendly professors are more appreciated. Japan, on the other hand, is

more likely to have a directional supply learning environment where knowledge tends to flow from professor to student and brilliant professors are more likely to be admired. Finally, Italy tends to have a directional demand learning environment where knowledge flows are likely to be more interactive and brilliant professors are admired.



Cross-cultural Engineering Education Implications and Future Research

This paper shows that the learning experience in Japan is very different than that in the U.S. We classify Japan as being directional supply (Figures 1 and 2), with centralized social influence hierarchy as measured by power distance and tight knowledge sharing coupling as measured by masculinity [28]. This is opposite to the learning experience we find in the U.S. which is observed to be interactive demand with decentralized hierarchy and loose coupling.

Engineering education in Japan can benefit from these cross cultural understandings by recognizing opportunities and challenges in the classroom. For example, American professors should look for opportunities for exposing students to interactive and bottom-up approaches. This is especially true if the classroom discussions and assignments are in English for improving English language speaking, listening, and writing opportunities for Japanese students.

The following grading criteria recommendations can help facilitate interactive participation in the classroom in Japan: 1) attendance and class participation, 2) written weekly homework, 3) midterm and final exams. By requiring students to attend classes and by assigning written homework every week, there should be a pool of students with prepared written content for bottom-up interaction. Since the English language is a challenge for most Japanese college

students, it is suggested that the length of most written assignments be limited to one or two pages. Advise the students to type their homework and print it out. They will then be able to have the confidence to read their homework when called upon in the classroom. At the end of the class collect the homework and grade it and try to give it back to the students by the next class. This continuous verbal and written interaction with the students in the classroom should make learning for them more motivational and effective. Finally, in addition to final exams (or final papers), recommend also having midterm exams (or midterm papers). Midterms will serve as a half-way point check for students to become more actively engaged if they are not yet at that point. Tuition in Japan is typically paid in advance of each semester and is a flat rate independent of the number of classes. Therefore, there is no financial penalty for “freeloading” any classes each semester by staying registered without attending.

Following the traditional Japanese lecture approach (high coupling/high hierarchy) in English will result in too much supply of knowledge to the Japanese students with too little understanding. A professor’s teaching will quickly reach saturation without any feedback from the students through active participation. Hence, the interactive classroom is vital not only for effective learning by the students, but also for effective pacing by the professor.

U.S. engineering education can also benefit from Japanese educational norms. The top-down social influence and tight coupling in Japanese universities with respect to graduation rates, internships, and job placement provide the students structural guidance for graduating within four years with good jobs. In summary, cross-cultural opportunities for professors as well as students can benefit not only developing countries, but also developed countries so that institutions do not become too path-dependent. For future research, we plan to empirically extend this study to include teaching and learning in Korea and compare and contrast this to Japan and the U.S.

References

1. Nations, U., *Word Investment Report*. United Nations Conference on Trade and Development, 2015: p. 258.
2. Brynjolfsson, E.a.A.S., *Wired for Innovation: How Information Technology Is Reshaping the Economy*. 2010, Cambridge, Mass.: MIT Press.
3. Yin, R.K., *Case Study Research: Design and Methods*. 2013: Sage Publications.
4. Nonaka, I., *A Dynamic Theory of Organizational Knowledge Creation*. *Organization Science*, 1994. **5**(1): p. 14-37.
5. Brown, J.S. and P. Duguid, *Knowledge and Organization: A Social-practice Perspective*. *Organization Science*, 2001. **12**(2): p. 198-213.
6. Alavi, M. and D.E. Leidner, *Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues*. *MIS Quarterly*, 2001. **25**(1): p. 107-136.
7. Hansen, M.T. and M.R. Haas, *Competing for Attention in Knowledge Markets: Electronic Document Dissemination in a Management Consulting Company*. *Administrative Science Quarterly*, 2001: p. 1-28.
8. Moran, P. and S. Ghoshal, *Value Creation by Firms*, in *Academy of Management Best Paper Proceedings*, Dossier, Editor. 1996, In J, B, Keys& L. N.: Georgia Southern University.
9. Nahapiet, J. and S. Ghoshal. *Social Capital, Intellectual Capital and the Creation of Value in Firms*. 1997. *Academy of Management*.
10. Yoo, Y., K. Lyytinen, and D. Heo, *Closing the gap: towards a process model of post merger knowledge sharing*. *Information Systems Journal*, 2007. **17**(4): p. 321-347.
11. Garud, R. and A. Kumaraswamy, *Vicious and Virtuous Circles in the Management of Knowledge: The Case of Infosys Technologies*. *MIS Quarterly*, 2005. **29**(1): p. 9-33.
12. Levinthal, D.A. and J.G. March, *The Myopia of Learning*. *Strategic Management Journal*, 1993. **14**(S2): p. 95-112.

13. Jones, Q., G. Ravid, and S. Rafaeli, *Information overload and the message dynamics of online interaction spaces: A theoretical model and empirical exploration*. Information systems research, 2004. **15**(2): p. 194-210.
14. Rogers, E.M., *Diffusion of Innovations*. 1983, New York: Free Press.
15. Karahanna, E., D.W. Straub, and N.L. Chervany, *Information technology adoption across time: a cross-sectional comparison of pre-adoption and post-adoption beliefs*. MIS Quarterly, 1999: p. 183-213.
16. Bandura, A., *Social Learning Theory*. 1977, New York: General Learning Press.
17. Kanawattanachai, P. and Y. Yoo, *The Impact of Knowledge Coordination on Virtual Team Performance Over Time*. MIS Quarterly, 2007. **31**(4): p. 783-808.
18. Bento, J., Jose Duarte, Manuel V. Heitor, William Mitchell, *Collaborative Design and Learning: Competence Building for Innovation (International Series on Technology Policy and Innovation)*. 2004, Westport, Connecticut: Praeger. 409.
19. Bento, R., et al., *A taxonomy of participation in online courses*. Journal of College Teaching & Learning (TLC), 2011. **2**(12).
20. Deutsch, M. and H.B. Gerard, *A study of normative and informational social influences upon individual judgment*. The journal of abnormal and social psychology, 1955. **51**(3): p. 629.
21. Brass, D.J., et al., *Taking Stock of Networks and Organizations: A Multilevel Perspective*. Academy of Management Journal, 2004. **47**(6): p. 795-817.
22. Lou, H., W. Luo, and D. Strong, *Perceived critical mass effect on groupware acceptance*. European Journal of Information Systems, 2000. **9**(2): p. 91-103.
23. Kraut, R.E., et al., *Varieties of social influence: The role of utility and norms in the success of a new communication medium*. Organization Science, 1998: p. 437-453.
24. Katz, M.L. and C. Shapiro, *Network externalities, competition, and compatibility*. The American economic review, 1985. **75**(3): p. 424-440.
25. Agichtein, E., et al. *Finding high-quality content in social media*. in *WSDM '08 Proceedings of the international conference on Web search and web data mining*. 2008. Palo Alto, CA: ACM.
26. Liang, H., et al., *Assimilation of enterprise systems: The effect of institutional pressures and the mediating role of top management*. MIS Quarterly, 2007. **31**(1): p. 59-87.
27. Liang, H. and Y. Xue, *AVOIDANCE OF INFORMATION TECHNOLOGY THREATS: A THEORETICAL PERSPECTIVE*. MIS Quarterly, 2009. **33**(1): p. 71-90.
28. **Hofstede G, G.H., M Minkov, *Cultures and Organizations: Software of the Mind*. 1991, New York: McGraw Hill.**
29. Weick, K.E. and K.H. Roberts, *Collective Mind in Organizations: Heedful Interrelating on Flight Decks*. Administrative Science Quarterly, 1993. **38**(3): p. 357-381.
30. Burns, T. and G.M. Stalker, *The Management of Innovation*. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship, 1961.
31. Fiedler, F.E., *A Contingency Model of Leadership Effectiveness*. Advances in Experimental Social Psychology, 1964. **1**(1): p. 149-190.
32. Bandura, A., *Social Foundations of Thought and Action: A Social Cognitive Theory*. 1986, Saddle River, New Jersey: Prentice-Hall, Inc. 617.
33. Blau, P.M., *Presidential Address: Parameters of Social Structure*. American Sociological Review, 1974: p. 615-635.
34. Wagner, J.A., *Organizations*. Encyclopedia of psychology, ed. A.E. Kazdin. Vol. 6. 2000, New York: Oxford University Press, American Psychological Association. 508.
35. Johnson, M.D., et al., *Cutthroat Cooperation: Asymmetrical Adaptation to Changes in Team Reward Structures*. Academy of Management Journal, 2006. **49**(1): p. 103-119.
36. Wagner, C., *Wiki: A Technology for Conversational Knowledge Management and Group Collaboration*. Communications of the Association for Information Systems, 2004. **13**(13): p. 265-289.
37. Johnson, E.C., B.A. Robbins, and M.C. Loui, *What Do Students Experience as Peer Leaders of Learning Teams?* Advances in Engineering Education, 2015. **4**(4).
38. Hannafin, M.J. and H.K. M., *Cognition and Student-Centered, Web-Based Learning: Issues and Implications for Research and Theory*, in *Learning and Instruction in the Digital Age*, J.M. Spector, Editor. 2009, Springer: New York. p. pp 11-23.
39. Pennings, J.M., *Structural Contingency Theory: A Reappraisal*. Research in Organizational Behavior, 1992. **14**: p. 267-267.
40. Orton, J.D. and K.E. Weick, *Loosely Coupled Systems: A Reconceptualization*. Academy of Management Review, 1990: p. 203-223.

41. Giessner, S.R. and T.W. Schubert, *High in the Hierarchy: How Vertical Location and Judgments of Leaders' Power are Interrelated*. *Organizational Behavior and Human Decision Processes*, 2007. **104**(1): p. 30-44.
42. Berente, N. and Y. Yoo, *Institutional Contradictions and Loose Coupling: Postimplementation of NASA's Enterprise Information System*. *Information Systems Research*, 2012. **23**(2): p. 376-396.
43. Weber, M., *Economy and Society: An Outline of Interpretive Sociology*, ed. G.R.a.C. Wittich. 1922/1978, New York: Bedminster Press.
44. Hollenbeck, J.R., et al., *Asymmetry in Structural Adaptation: The Differential Impact of Centralizing versus Decentralizing Team Decision-making Structures*. *Organizational Behavior and Human Decision Processes*, 2011. **114**(1): p. 64-74.