PIMS

Program in Innovation Management and Innovation Strategy

NTNU – Trondheim
Norwegian University of Science and Technology

Exploration and Exploitation in Organizations

A PIMS PhD Course

June 10-13, 2013 in Trondheim, Norway

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COURSE DESCRIPTION

This course examines research on the phenomenon of exploration and exploitation at the organizational level. The framework of exploration and exploitation has become central to the study of organizational learning, innovation, and performance. At the most basic level exploration entails generating new knowledge whereas exploitation involves refining and applying existing knowledge. Nevertheless, this framework has been extended to various other contexts and levels of analysis. The paradox of exploration and exploitation is that both activities are essential for performance but there are inherent tradeoffs that make it challenging for firms to maintain balance between them. In this course we will study the alternative definitions, assumptions, and perspectives used in research on exploration and exploitation. We will identify the environmental and organizational antecedents that drive firms' tendencies to explore versus exploit. This will be followed by considering the consequences of exploration and exploitation, underscoring implications for organizational performance. Next, the emphasis will shift from exploration and exploitation within organizations to exploration and exploitation across organizations, acknowledging relevant research on interfirm alliances. Particular attention will be paid to the notion of balance between exploration and exploitation. We will assess alternative approaches for balancing exploration and exploitation and consider their performance implications. The last day of the course will be devoted to offering guidance on developing students' research papers.

METHOD AND EXPECTATIONS

The course will be delivered in a seminar format, expecting students to be highly involved in discussion of the assigned articles. Students will be expected to demonstrate critical review skills and identify the contributions and limitations of the assigned articles. When reading the articles in preparation for class discussion, try to identify the motivation for the study; assess its positioning relative to prior research; understand the underlying logic behind the hypotheses; evaluate the research design including data, sample, operationalization of the variables, and analysis techniques; examine the validity and interpretation of the results; and consider the implications of the study and how it relates to other studies. When evaluating the set of articles assigned to a particular session, compare and contrast the studies, identify points of agreement and disagreement, and come up with ideas for how to integrate and reconcile them. Finally, think about ideas for future research that extend the research or build on its arguments. For each session, several lead questions have been listed. These are fundamental questions that should be considered in preparation for class discussion. Note that these are only suggested questions, while the discussion itself will be more extensive in scope and depth. Students are encouraged to prepare their own questions for class, including clarification questions about issues that were not straightforward in the articles and questions concerning their methodologies. Given the intensive schedule of the course, students are advised to read the articles in advance and use the included review form for summarizing the main aspects of each article.

During sessions, I will offer some introductory remarks, following which each of the assigned articles will be discussed in turn. At the beginning, either I or one of the students assigned as a lead discussant of the article will offer a 10-minute presentation that provides an overview of the article. As a lead discussant, a student should provide copies of his or her presentation slides to all other participants in the session. The purpose of the presentation is mostly to make sure that everyone is on the same page. The presentation should highlight the motivation, theory, research design, results, and intended contributions of each article, with limited interpretation. We will then discuss each article, followed by an overall discussion of the session's theme and conclusions from the set of assigned articles. During class discussion, feel comfortable to share thoughts and relate to other students' ideas. We seek to establish a supportive learning environment in which everyone feels free to share and exchange ideas. At the end of the session I may offer some concluding remarks that provide an integrative view of the theme.

The final section of the course is devoted to providing students with personal feedback on their own research. Be prepared to describe and explain your research as well as identify issues on which you would like to receive feedback. The time devoted for each individual session is 30 minutes.

COURSE ASSIGNMENTS AND GRADING

Course grading will be based on the following assignments and deliverables:

50% **-** Submission of 20 review forms for the articles assigned to Sessions 1, 2, 3, 5 and 6 with the exception of the “Revisit” articles reviewed in earlier sessions. Each completed form is limited to 2 pages. These forms will not be graded. You will receive the full grade for submitting them. Please submit via email before the corresponding session.

20% **-** Lead discussant presentation. You will be assigned as a lead discussant of one article (see Course Schedule and Reading Assignments). I will grade your presentation based on its delivery in class. Make sure you can deliver the presentation in 10 minutes. Please submit your presentation slides to me and to all other students via email prior to the corresponding session. Bring your presentation on a memory stick for backup.

30% **-** Contribution to class discussion. I will assess your contribution to class discussion following each session. Contribution is assessed based on quality rather than quantity. Dominating class discussion without offering meaningful contribution in the form of insights, integration, thoughtful questions etc., is discouraged. Listening and relating to others’ ideas is a valid contribution. Nevertheless, unless you actively participate in the discussion, you cannot contribute.

REVIEW FORM - EXAMPLE

Authors (Year)	Mitchell & Singh (1993)
Title	Death of the lethargic - effects of expansion into new technical subfields on performance in a firms base business
Abstract	This paper finds that industry incumbents that do not expand into new technical subfields tend to fare poorly in their established businesses, even if the market for the established products continues to exist. Firms that expand from their established businesses survive longer and achieve greater subsequent market share than competitors that do not expand. By some measures, however, a failed attempt to expand into a new subfield may be even more harmful to a base business than non-expansion. The study employs conventional and accelerated event-time regression models to analyze market share and survival. The sample, which includes 371 incumbents in four base subfields of the medical diagnostic imaging industry between 1953 and 1989, examines performance following the emergence of five new technical subfields of the industry.
Theoretical framework	Population ecology theory
Sample	371 incumbents in four base subfields of the medical diagnostic imaging industry (x-ray, nuclear, ultrasound, and CT) between 1953 and 1989, in the U.S. (100 of which expanded into emerging subfields, 81 exiting by acquisition and 106 by dissolution.)
Unit of analysis	Firms
Dependent variables [measures]	- Survival [the length of a firm's continued participation in the base subfield in number of years] - Performance [the subfield dollar revenue market share held by a pre-introduction incumbent during years 4, 8, and 16 after the emergence of the new subfield]
Independent variables [measures] + moderators	Exit [by dissolution or by acquisition]
Controls [measures]	Incumbent’s prior subfield market share firm size [natural log of total corporate sales during the year before a new subfield emerged] nationality [0-1 indicator of firm majority ownership]
Definition of key construct	[*provide the definition of exploration-exploitation in the reviewed paper*]
Hypothesis	Hypothesis la. A pre-introduction incumbent that expands into the new subfield will have longer survival in its base subfield than firms that do not expand. Hypothesis lb. A pre-introduction incumbent that expands into the new subfield will attain greater subsequent market share in its base subfield than firms that do not expand but survive. Hypothesis 2a. The greater the industry-wide market share held by a pre-introduction incumbent, the longer its continued survival in its base subfield. Etc.
Results	• Hypothesis 1a and 1b are supported • Hypothesis 2a partially supported, Hypothesis 2b supported • Hypothesis 3b supported for years 4 and 8 only • Hypothesis 4a supported, 4b supported and 4c not supported Etc.
Implications and Limitations	[*Here you should identify remaining research gaps, weaknesses of the paper, suggestions for improvement, implications of the study, and how it relates to other papers you have read*]

COURSE SCHEDULE AND READING ASSIGNMENTS

Session 1 – Monday, June 10, 10:00-13:00

Topic: Introduction and Foundations

Reading Assignments:

March, J. G. 1991. Exploration and exploitation in organizational learning. *Organization Science*, 2: 71-87 (Revisit – listed in Richard Harrison's class)

Levinthal, D. A., & March, J. G. 1993. The myopia of learning. *Strategic Management Journal*, 14 (special issue): 95-112.

Gupta, A. K., Smith, K. G., & Shalley, C. E. 2006. The interplay between exploration and exploitation. *Academy of Management Journal*, 49: 693-706.

Raisch, S., Birkinshaw, J., Probst, G., & Tushman, M. 2009. Organizational ambidexterity: Balancing exploitation and exploration for sustained performance. *Organization Science*, 20(4), 685–695.

Discussion Questions:

1. How should we define "exploration" and "exploitation"?
2. Are exploration and exploitation independent or interdependent?
3. Are exploration and exploitation complementary or contradictory activities?
4. Should firms pursue both exploration and exploitation or specialize only in one activity?
5. How should firms effectively engage in both exploration and exploitation?

Session 2 – Monday, June 10, 14:00-17:00

Topic: Antecedents of Exploration and Exploitation

Reading Assignments:

Nohria, N., & Gulati, R. 1996. Is slack good or bad for innovation? *Academy of Management Journal*, 39(5), 1245–1264 (Presentation - Mohammad Javadinia Azari)

Sidhu, J.S., Volberda, H.W., & Commandeur, H.R. 2004. Exploring exploration orientation and its determinants: Some empirical evidence. *Journal of Management Studies*, 41(6), 913–932. (Presentation - Rikke Stoud Platou)

Jansen, J.J.P., Van den Bosch, F.A.J., & Volberda, H.W. 2006. Exploratory innovation, exploitative innovation, and performance: Effects of organizational antecedents and environmental moderators. *Management Science*, 52(11), 1661–1674. (Presentation - Kenneth Stålsett)

Voss, G.B., Sirdeshmukh, D., & Voss, Z.G. 2008. The effects of slack resources and environmental threat on products exploration exploitation. *Academy of Management Journal*, 51(1), 147–164. (Presentation - Marta Morais-Storz)

Posen, H., & Levinthal, D. 2012. Chasing a Moving Target: Exploitation and Exploration in Dynamic Environments. *Management Science*, (58), 587-601.

Discussion Questions:

1. What motivates firms' efforts to explore and exploit?
2. How do environmental factors drive exploration and exploitation?
3. How do organizational factors affect exploration and exploitation?
4. What are some boundary conditions to the antecedents identified in the literature?
5. What drives firms toward balance versus imbalance of these activities?

Session 3 – Tuesday, June 11, 9:00-12:00

Topic: Consequences of Exploration and Exploitation

Reading Assignments:

Auh, S., & Menguc, B. 2005. Balancing exploration and exploitation: The moderating role of competitive intensity. *Journal of Business Research*, 58(12), 1652–1661 (Presentation - Lisa Synnøve Schüle Græslie)

Siggelkow, N., & Rivkin, J. 2006. When exploration backfires: Unintended consequences of multilevel organizational search. *Academy of Management Journal*, 49(4), 779–795. (Presentation - Nhien Nguyen)

He, Z.L., & Wong, P.K. 2004. Exploration vs. exploitation: An empirical test of the ambidexterity hypothesis. Organization Science, 15(4), 481–494. (Presentation - Kine Norheim)

Jansen, J.J.P., Simsek, Z. & Cao, Q. 2012. Ambidexterity and Performance in Multi-unit Contexts: Cross-level Moderating Effects of Structural and Resource Attributes. *Strategic Management Journal*, 33(11), 1286-1303. (Presentation - Joseph Samuel Schultz)

Discussion Questions:

1. How do the consequences of exploration and exploitation differ?
2. Do the consequences of exploration depend on exploitation or vice versa?
3. Under what conditions can a firm maximize the effects of exploration and exploitation?
4. How does balancing exploration and exploitation maximize performance?

Session 4 – Tuesday, June 11, 13:00-16:00

Topic: Balancing Exploration and Exploitation across Boundaries (Executive Session)

Reading Assignments:

O'Reilly, C. A., Tushman M. 2004. The Ambidextrous Organization. *Harvard Business Review* 82 (4), 74–81.

Lavie, D., Stettner, U. & Tushman, M. 2010. Exploration and Exploitation within and across Organizations, *Academy of Management Annals*, Vol 4, 109-155

Hess, A. M., Rothaermel, F. T. 2011. When are assets complementary? Star scientists, strategic alliances and innovation in the pharmaceutical industry. *Strategic Management Journal*, 32 (8): 895-909. (for students only)

Stettner, U. & Lavie, D. (working paper) "Striking a Balance: Exploration and Exploitation via Internal Organization, Alliances, and Acquisitions" (for students only)

Discussion Questions:

1. What are the costs/benefits of pursuing exploration and exploitation within a unit (executives)
2. How do you balance exploration and exploitation in your company? (executives)
3. How do you separate exploration from exploitation? How do you integrate them? (executives)
4. Which mode is most appropriate for exploration and which for exploitation? (executives)
5. Provide examples of successful efforts to balance exploration and exploitation (executives)
6. How can research on exploration and exploitation inform practice? (students)
7. What new insights from the field can inform research on exploration and exploitation? (students)

Session 5 – Wednesday, June 12, 9:00-12:00

Topic: Exploration and Exploitation at the Inter-organizational Level

Koza, M. P., A. Y. Lewin. 1998. The co-evolution of strategic alliances. *Organization Science*. 9(3) 255–264. (Presentation: Seidali Kurtmillaiev)

Rothaermel, F. T., & Deeds, D. L. 2004. Exploration and exploitation alliances in biotechnology: A system of new product development. *Strategic Management Journal*, 25 (3): 201-221. (Presentation: Monica Rydland)

Lavie, D., & Rosenkopf, L. 2006. Balancing exploration and exploitation in alliance formation. *Academy of Management Journal*, 49(4), 797–818

Lin, Z., H. Yang, I. Demirkan. 2007. The performance consequences of ambidexterity in strategic alliance formations: Empirical investigation and computational theorizing. *Management Science*. 53(10) 1645–1658. (Presentation: Daniel Leunbach)

Discussion Questions:

1. How can one define exploration and exploitation in alliances?
2. What drives firms' tendencies to explore versus exploit in alliances?
2. How should firms balance exploration and exploitation in alliances?
3. Should alliances complement or substitute internal efforts for exploration and exploitation?

Session 6 – Wednesday, June 12, 13:00-16:00

Topic: Approaches for Balancing Exploration and Exploitation

Gibson, C.B., & Birkinshaw, J. 2004. The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47(2), 209–226. (Presentation: Erik Andreas Sæther)

Benner, M.J., & Tushman, M. 2002. Process management and technological innovation: A longitudinal study of the photography and paint industries. *Administrative Science Quarterly*, 47(4), 676–706. (Presentation: Ingrid Lunde Ohna)

Brown, S.L. & Eisenhardt, K.M. 1997. The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly*, 42(1), 1–34. (Presentation: Trond Rikard Olsen)

Lavie, Dovev, Kang, Jingoo & Rosenkopf, Lori. 2011. Balance within and across Domains: The performance Implications of Exploration and Exploitation in Alliances. *Organization Science*, 22(6), 1517-1538

Lavie, D., Stettner, U. & Tushman, M. 2010. "Exploration and Exploitation within and across Organizations", *Academy of Management Annals*, Vol 4, 109-155 (Revisit)

Discussion Questions:

1. What does balance between exploration and exploitation mean? How can we measure it?
2. What are the assumptions of alternative approaches for balancing exploration and exploitation?
3. In what dimensions do these approaches differ?
4. Are these alternative or complementary approaches for maintaining balance?
5. What skills and techniques can firms adopt to effectively balance exploration and exploitation?

<u>Session 7 – Thursday, June 13, 9:00-10:45</u>

Topic: Managing Your Dissertation

Reading Assignments:

Lavie, D. "Developing and Defending Your Research Proposal", *Strategic Management Society 30th Annual International Conference*, September 11, 2010, Rome, Italy (Slides will be distributed in class)

Discussion Questions: Open floor

10:45 – 11.10 Check-Out

11:10 Bus to Brittania Hotel, Trondheim

11:45 Arrive Brittania Hotel (see next page for program)

CONFERENCE 13 JUNE 2013

BRITANNIA HOTEL

GLOBALIZATION

Doing Management Research – on the Knife-Edge of Academic Excellence and Practical Value

NTNU Globalization Programme Work Shop 13th June 12.00-16.00

New Global Production, Workshop leader Professor Arild Aspelund

How do you get your research published in the top-level journals, while still keeping real managers interested? How do you balance requirements for short-term return-on-investment from cooperating case companies, and the need for top-level publications for your long-term academic career? Is *Academic Excellence* and *Practical Value* mutually exclusive or actually two sides of the same coin? One thing is for sure; it is a difficult task to satisfy all stakeholders in any research project.

At this workshop a distinguished panel of speakers will address the topic from different angles and viewpoints. You are welcome to join for lunch, speeches and discussions.

Agenda:

- 12.00-13.00 Lunch
- 13.00-14.00 Presentations from our speakers
- 14.00.14.30 Break and mingle
- 14.30-15.45 Panel discussion
- 15.45-16.00 Summing up and good bye

Speakers and panel:

- Dovev Lavie, Associate Professor, Technion
- Per Olaf Brett, Dr Oecon, Deputy Managing Director, Ulstein International
- Ola Strandhagen, Professor NTNU

Please register to Torbjørn Netland (torbjorn.netland@iot.ntnu.no) no later than Thursday 6th June.

NTNU Det skapende universitet