Marie Thursby from Purdue University passed out a handout and presented a series of study questions to the group for the session on research in technology entrepreneurship. She asked the people present to think about the literature on technology entrepreneurship and other things that may be useful to assess where we are now and where we would like to go in the field. She presented three questions:
The first question is “what is it?” In other words, what would you define technology entrepreneurship to be, and what would be the reasonable body of issues to look at?

The second question is “is it distinct from entrepreneurship?” Would you use the same research methods to study technology entrepreneurship that are used to study entrepreneurship?

Finally, she asked, if they are distinct, in what way are they distinct?

Next, Marie Thursby asked, “what is entrepreneurship?” There are many definitions of entrepreneurship, so she presented Scott Shane’s recent definition as shown below.
What is Entrepreneurship?

- “Scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited.”

- “To have usefulness, it must have a conceptual framework that explains and predicts a set of empirical phenomena not explained or predicted by conceptual frameworks already in existence in other fields.”

Scott Shane and S. Venkataraman
“The Promise of Entrepreneurship as a Field of Research,” Academy of Management Review, 2000

Marie Thursby said that the first definition is important because it presents entrepreneurship as the nexus of two things: (1) the existence of lucrative opportunities and (2) the individuals who may take advantage of it. She considered the second quote more controversial.

She told those present to assume that the definition is right, and asked them, “how would the definition change for technology entrepreneurship, and would it be a useful field of research?”

If technology entrepreneurship can be defined, Marie Thursby then asked: “why should we study technology entrepreneurship?”
Within this context, Marie Thursby asked: “what are the important empirical phenomena that are currently unexplained?” What are the issues that are worth looking at? What are the promising research questions? In addition, she proposed an interesting and controversial question: can we develop best practices for engineering and business students?
Next, Marie Thursby presented a slide as food for thought discussing the state of business school education in the United States that suggested business schools are ruining themselves. Business schools are teaching examples, not research. This is an important point to discuss given that organizations such as the Ford Foundation are investing a lot of money into business schools to fund research.

Finally, Marie Thursby presented a final set of questions:

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Research: A Necessary Input to Education?

- “It is ...research that propelled U.S. business schools to a dominant position among world business schools and to a high status on their campuses.”

- “Business education changed from giving students rules of thumb...to teaching them how to arrive at solutions to problems they would likely encounter. Driving these curricular reforms was basic research.”

What are the challenges?

- Are new research methods or collaborations required?
- How do you obtain funding?
- What are the best ways to disseminate research?

She said: “suppose technology entrepreneurship is worth studying, what are challenges of doing it?” For example, are new types of collaboration needed to do research in this area? How should you do research and who should do it? Currently, the psychology, sociology and economics disciplines as well as technical and business fields study technology entrepreneurship. Since we are discussing technology entrepreneurship, should there be collaboration across technical and business fields? Should we get graduate students involved as well? In terms of methods, are there different ways of analyzing data or are case studies the best form of empirical work?

Supposing we decide to study technology entrepreneurship, a second related question is where do you obtain funding for the research?

Finally, what are the best ways to disseminate results? If it is academic research, in what journals do you publish? What is the institutional reward for publishing technology research? If it’s practical research, what are the rewards?
Marie Thursby ended her presentation with a slide from Amit, Glosten and Muller (1993) discussing the problems involved in technology entrepreneurship research. The basic problem of technology entrepreneurship is that it is an interdisciplinary field, so formulating a theory or conceptual framework is extremely difficult. Although it is difficult to form one conceptual domain, it may be possible to form a conceptual question by integrating different pieces from various disciplines. But the question becomes even more complex if engineering is required.

What proceeds in this section is a summary of the major ideas discussed, since I was unable to obtain the names of all the contributors to the discussion. I have attempted to categorize the ideas according to the subject headings of Marie Thursby’s presentation.

At this point, Marie Thursby opened the floor for discussion with the question, what do you think technology entrepreneurship is? This question led to a disagreement among those present on how to differentiate between technology entrepreneurship and entrepreneurship per se. For example, one participant argued that the theory of the firm provides an underlying structure of analysis for studying both large and entrepreneurial businesses. Likewise, he argued that both large and small firms could exhibit entrepreneurship.

Another participant disagreed with him, and argued that organizational context is important. He said that intrapreneurship and entrepreneurship is not the same thing, since the latter requires the establishment of a new venture.

An argument ensued over whether or not the essential differentiator between technology entrepreneurship and entrepreneurship was the element of growth. Some viewed firms with high growth potential as entrepreneurial, but this definition seemed incomplete. For
instance, is Amazon an entrepreneurial firm? Is it a high technology entrepreneurial firm? It is also a subjective issue. Is a GM new Minivan a technology? GM seems to think so.

Along these lines, one participant argued that the major differentiating factor is the nature of the opportunity – the opportunity for radical innovation. Technology entrepreneurship would study the opportunities created by technical discovery. He argued that the nature and evaluation of opportunities for those firms is different than those for non-technical firms. Meanwhile, some participants considered whether or not the differences in product life cycles and firm adaptive capabilities could distinguish technology entrepreneurship from entrepreneurship. The degree of uncertainty and imperfect information surrounding the introduction of a new technology was mentioned as another potential defining factor.

Finally, one participant explained that his school used a similar definition of entrepreneurship as Shane. At his school, they define entrepreneurship as the discovery, evaluation and exploitation of opportunities. Their approach considers technology entrepreneurship a subset of entrepreneurship in which goods and services have a technological basis for cost performance advantage. Technology does not have to be new. The technology could be old but used in a new way to achieve improved cost performance. This definition excludes firms like McDonald’s.

During the discussion, some participants suggested the creation of a new discipline to study technology entrepreneurship. One argued that in technology entrepreneurship, firms have to create their customers as opposed to the traditional model in which firms are guided by customer needs. As a result, technology entrepreneurship raises unique questions and issues of pedagogy and teaching that cannot be addressed through existing course content. Some participants disagreed, arguing that the paradigm has not changed since new technologies have always existed in the past.

At the same time, the participants expressed concern of the hurdles that needed to be overcome before technology entrepreneurship could become a discipline. One problem is the incentive/reward structure in academia. For example, researchers would need to get credit for their work in technology entrepreneurship, but work in this area would not count for tenure in existing disciplines. To this regard, some of the researchers stated that they conducted studies in technology entrepreneurship only because they already had tenure in their respective disciplines. Finally, the participants mentioned Stanford University and MIT as vanguards, while other schools are moving towards a more holistic design in this area. In the Stanford case, technology entrepreneurship emerged from the industrial engineering department.

The question of technology entrepreneurship course content was raised. What do you include, what do you exclude, and how could research be done a different way? One participant argued that course content should emerge from interaction with people working in technology entrepreneurship, but should go beyond observation. Another participant argued that the course curriculum needed to go beyond teaching principles, and should include the classic business disciplines (i.e., finance, marketing, etc.) as applied to technology entrepreneurship, as well as grounding in complex decision-making, innovation and creativity. Several participants reaffirmed this point. For example, teaching venture finance instead of finance, technological advantage and the Chasm stuff instead of marketing, and strategy and technology management (i.e., organizational behavior) from an entrepreneurial standpoint. One of the participants argued that teaching the strictly
venture-backed high technology commercialization model was enough. He indicated that his school emphasizes the venture-funded model for commercialization as a frame of reference, while pinpointing the differences between venture-backed and non venture-backed commercialization including intrapreneurship. They basically teach students (including engineering students) the process of how to turn an idea into a commercial reality by helping them to learn principles and apply these principles to cases. Another participant emphasized the need of studying psychology, since in his point of view the failure of the dotcoms was as much psychological as financial. There was consensus that marketing, finance and psychology are at embryonic stages; that there are very few small company stages; and few courses on how to recognize opportunities.

Regarding dissemination, the discussion highlighted that there is no shortage of articles on technology entrepreneurship in business journals, but scant discussion of these issues in engineering journals (perhaps only the Journal of Engineering Education). Some participants argued for the expansion of an existing journal or the establishment of a new journal to specifically disseminate technology entrepreneurship research issues, especially in engineering. One participant suggested ASME and IEEE to incorporate technology entrepreneurship issues in their conferences and proceedings.

Marie Thursby raised an additional question that remained unanswered: if we don’t have research and don’t attract people to technology entrepreneurship, who will teach this down the line?

*By Yosem E. Companys*

*Ph.D. Candidate, Management Science & Engineering*

*Stanford University*

*E-mail: companys@stanford.edu*