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# Innovations Unlimited:

Advancing Education, Investing in Change

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## Entrepreneurship Education in Forty Hours—You Can Do It!

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### Abstract

Kettering University's terms are but eleven weeks long, allowing for forty hours of instruction. Four sections of the course over two years have proved that students can appreciate the risks, processes, and rewards of entrepreneurship in this short time frame. Students begin with a self-created idea around which to build a business, vote for best ideas, form teams (companies), and pursue the projects to develop a business plan for presentation at the conclusion of the term. Alternately, some teams are provided industrial patents to commercialize as examples of intrapreneurship. Evaluation of the results by faculty outside the course and the supplier of the patents indicate that, indeed, you can teach entrepreneurship in forty hours. This paper provides examples of student projects and discusses the project development process.

### Background

Kettering University is a cooperative education school where students attend school for eleven weeks of academic classes and work at a co-op job for twelve weeks. This pattern repeats for four and a half years. All of our classes are four credit hours, so we are limited to four hours of class time per week, which we typically implement in two two-hour sessions. The course entitled "Innovations and New Ventures" is the first of a series of classes leading to a minor in entrepreneurship through the Department of Business. Additional requirements for the minor are a course in business law including intellectual property and a course in entrepreneurial finance. Students choose a fourth course from a list of electives. The original version of the course was for fourth-year students but, to make it the initial course in the minor, it is being moved to become a third-year course. This will begin in the next academic year.

Unlike many courses in entrepreneurship where the goal is to spawn new businesses by students, our academic schedule does not permit such an approach. Since our students are not in school for consecutive terms (each school term is followed by a similar length co-op work term), we do not have the luxury of working with these students for a period of fifteen to thirty weeks to fully create such an enterprise. Thus, the thrust of our course is to identify the processes used to create a business, allow the students to practice some of those processes on a self-selected topic, and produce a final business plan as if they were going to bring the project to a business conclusion. Schools with a longer period of time working with the students can include more in-depth studies, particularly in the financial area. Because of our short terms, we can only assist the students to produce reasonable financial statements without the more complete presentations of other schools.

For example, Valparaiso University in Indiana uses a two-course sequence of twenty-hours each with classes called “Fundamentals of Business for Engineers” and “Developing the Entrepreneurial Mindset”.<sup>1</sup> These do not end in a business plan presentation. Another alternative is a degree program like Stanford where an eight-course sequence leads to a graduate degree. The course described here compresses many of the ideas from such courses into a single course, with an obvious curtailing of details.

Kettering practices our version of what has been commonly described as “economic gardening” where we plant the seed of an idea, nourish the idea through academic and experiential learning, and make the germinated idea ready for transplanting into the real world. In essence, we are acting as a nursery for the seeds of entrepreneurship.

The first course described in this paper is intended to be an introduction to the processes used in entrepreneurship and, if necessary, could stand alone as an introductory course without the other courses for a minor. As such, it includes much material that, at some schools, would be spread over two or more courses.

The initial task is to define the course and choose appropriate faculty. To progress from the conception of a technical product or service until a business plan is created, a combination of engineering and business faculty was chosen to lead the class in a co-teaching role. The engineering professor has a background in product development and taught creativity for fifteen years. Many of those concepts are included in the class, as appropriate. He works with the students to take their ideas through the innovation, refinement, and market research phases. The business professor for the first offerings of the class had industrial experience that was appropriate for the class. A later version of the class utilized the McDonald Endowed Chair of Entrepreneurship as the second professor in the class.

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<sup>1</sup> Tougaw 2008

His background included over twenty years of entrepreneurial and intrapreneurial activities. In this class, his role is to discuss the marketing and sales, leadership team and staffing, and financial and funding phases.

We draw students from all disciplines in the university. The Mechanical Engineering program is the largest in the university and also contributes the majority of students to this class, but students in other engineering disciplines and those in business and the applied sciences have also been very successful in the class. The multidisciplinary nature of the class is of great benefit for class discussion.

## Curriculum

The curriculum follows a typical sequence used by many authors.<sup>2,3</sup> We divided the course material into seven basic sections. These are:

- Getting started – finding, presenting, and selecting the projects for the term
- Finding the market – defining the market and researching that market
- Building the team – building unity among team members
- Testing the concept – relating the project to the market and capturing the market
- Protecting intellectual property – defining the benefits of IP legal documents and trade secrets
- Financing the idea – determining sources of capital to keep the company afloat
- Presenting the business – writing and presenting the final business plan or business case

There are six course objectives for this one-term course. They are:

1. Students will demonstrate the ability to develop a product or service and refine that concept towards commercialization.
2. Students will demonstrate a knowledge and comprehension of the structure of an industry of their choice by analyzing current firms, their market strategies and any impact of regulation/deregulation.
3. Students will demonstrate an ability to evaluate alternative product or service solutions to consumer needs and to assess the commercial viability of a new product or service offering.
4. Students will demonstrate an ability to apply life cycle assessment and costing to alternative product and service offerings.

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<sup>2</sup> Timmons and Spinelli 2007

<sup>3</sup> Ewing Marion Kauffman Foundation, Kansas City, MO. See also [www.kauffman.org](http://www.kauffman.org) and [www.fasttrac.org](http://www.fasttrac.org)

5. Students will demonstrate the ability to create a business plan for a new enterprise based on an innovation in product, service or delivery that is economically viable and environmentally sustainable.
6. Students will demonstrate the ability to assess alternative funding sources for a startup concern and to identify and propose remedies for new venture startup problems.

These are most ambitious and not every team reaches the same level of meeting these objectives; however, each team demonstrates some level of success for each objective.

Since persuasive speaking is so critical to gaining support for a new idea and attracting financing, students craft their skills by making a series of presentations during the course of the term.

1. Persuasive speech – a one-minute verbal ad for any product, real or imaginary
2. Idea pitch – a five-minute talk with no more than five PowerPoint slides to pitch their technology-based product or service concept
3. Elevator pitch – ninety-second talks, given twice, perfect the pitch. The first one is videotaped for students to improve their pitches
4. Rocket pitch – a five-minute talk with no more than five PowerPoint slides to make a pitch to potential investors
5. Final plan presentation – a twenty-minute talk with PowerPoint slides

Students make the rocket pitch to persons other than the faculty teaching the class to lend some realism to the presentation. Presentations are videotaped for later analysis by the students. Typical outside persons include: Regional Director of the Michigan Small Business Technology & Development Center, venture capitalist representatives, and interested faculty from other disciplines. Students give the final business plan to as many outsiders as we can assemble. All pitches except for the final business plans are heard by all students in the class.

There are essentially two academic tracks running concurrently in the classes. The first is the creation/innovation side where the engineering professor discusses the processes of idea creation and product development. These are general philosophies and activities that occur in the classroom and derive from the professor's background in teaching creativity.<sup>4</sup> The second track is the business track where the business professor takes the students through marketing and sales, team creation and building, funding and the financing issues. An essential feature of the class is

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<sup>4</sup> Riffe 2002.

that both professors are in the class at all times, both for student critique and comments from their personal experiences.

A novel feature of the class is the use of intellectual property from existing companies (some of our cooperative education sponsors) where the student teams develop a commercial market for the product based upon the technology of the patents. We have been successful in doing so with two patents and that client returned, asking us to do additional patent commercialization. Since this approach is still new, we are growing our list of project sponsors. To maintain the confidentiality of the projects and the sponsors, no details will be provided. Students are provided the name or names of individuals at these companies who will be their contact and resource person during their investigation. They are encouraged to use these persons as often as necessary to complete their assignment.

Each student is required to present his or her project idea before the class in a three-to-five-minute oral pitch using a maximum of five slides. Students are each provided with \$1 million virtual dollars and asked to behave as if they were venture capitalists and contribute to those projects that they deemed worthy of investment. The only stipulation is that they cannot vote for themselves. The projects with the highest virtual capitalization are declared the projects for the term. The proposer becomes the CEO of that team and the unsuccessful presenters become members of these winning teams.

After the selection of projects and their teams, mini-workshops are held in class to lead students toward the final business plan. The results from each of these workshops are shared with the class so all can grow from the experience. The first of these is on “value proposition.” Teams create the proposition in a single sentence that conveys what they will be providing to the customer and why the customer should take advantage of the offering. Engineers are not known for their brevity of expression so this workshop creates a difficult task for our students. As the faculty moves from team to team, suitable value propositions are created.

The second mini-workshop looks at the four aspects of a company and determines where its strengths and weaknesses lie. Teams are asked to rank their projects according to product, financial strength, market, and technology. They are trying to determine whether their project is still an idea or whether there is an opportunity associated with it. By grading each with a letter grade (A-B-C-D), they can see where additional work needs to be done.

The third mini-workshop asks the teams to create a profile of their intended customer. Who is (s)he, what are their characteristics of age, economic position, interests, and geographical locations. The philosophy is, “If you cannot identify your customer, to whom you will sell your product or service?” Each team’s selections are put on the

board and discussed by the entire class. The intent is to provide focus for the project so that the tendency to include many alternatives is minimized.

As the projects progress, students must make assumptions in order to proceed. After working for a while, it is good to go back to these assumptions and review them. The fourth mini-workshop concerns critical success factors. Teams are asked to determine what assumptions are allowing for or preventing their project from proceeding. These are critical assumptions and could be “GO/NO GO” assumptions.

The next mini-workshop concerns marketing. How would each team market their project? What media would be used and how? Would the marketing approach reach the persons who would benefit by knowing about the project?

The use of electronic searching through the internet has made the task of getting information much quicker and easier. Data for market studies, applicable regulations, trade organizations, and other necessary information is easily obtained. This keeps the time allotted for the class and the work required for the projects within reasonable bounds.

Thus, our curriculum fits both entrepreneurship and intrapreneurship. By demonstrating that the skills and ideas needed for one are equally applicable to the other, we are supporting the potential needs of our co-op sponsors by educating their employees in the art and science of intrapreneurship that can expand their companies.

### **Project Selection Process**

Before our students return to school for this class, they are sent an email describing the major project and asked to think of a topic they would like to explore for their business venture. The only restrictions we place on the project are that it should be technically oriented (we are a technical school) and that it may not be a franchise operation.

On the third day of class, each student presents their idea in a short five-minute presentation using no more than five PowerPoint slides. At the conclusion of all presentations, the class is asked to vote for the ones that they would like to see become the class projects. To do this, each student is given \$250,000 “virtual” dollars to indicate funding of no more than four projects. Students select the top funded projects for the term. We make the student proposing the idea the CEO of the new company. In essence, the students get to act like venture capitalists.

Students receiving the next higher award values are given patents or other outside topics to investigate. This has both positive and negative effects. On the plus side, it gives the students a feeling about the activities that an intrapreneur might undertake on a similar project. It also fosters a closer relationship between the university and the

sponsoring companies. On the negative side, the student team gives up any real sense of ownership of the project, as it becomes just another assignment without at least the CEO taking that interest.

### **Out of Class Activities**

Journal: The pace of the class is such that not everything can be accomplished in the forty hours of class time. To keep things moving quickly, we require the students to maintain an electronic journal. At a minimum, students are required to submit a continuously running journal weekly such that, by the end of the term, they have a continuous record of their thoughts and concerns and progress. One professor reads these and annotates them using the “track changes—insert comment” tool in MSWord, and returns them to the student within two days. It is here that a private conversation can take place, questions regarding the project and team cooperation can be addressed, and delights or concerns regarding the class can be expressed. Students sign a waiver so faculty can use their comments anonymously for a maximum of three years in academic papers and promotional material. While most students find beginning a journal difficult, it seems to flow more readily starting about the middle of the term. For comments about class coverage, faculty can address the concerns at the next class meeting.

Some selected comments taken from student journals over the past few years:

1. I find myself getting excited about working on this project, and I’m actually working on it outside of class! Geez, look at that, I want to do homework.
2. I learned a lot, especially about coming up with ideas and how to develop them into something realistic. Most of the time, I just shoot stuff down instead of using new ideas to improve the process. It has been a good learning experience for me.
3. The class opened up our minds, allowed us to make connections into the business world, made us sit down and gave us time to work on something that we believed in as a team, and allowed connections that might of been there to really form and take hold.
4. Initially, I took this class to expand my creativity and as we near the end of it, I have definitely been challenged. I never knew that I could be the “CEO” of a start-up business and manage two other “employees.”
5. I think the project has been amazing and I have been able to apply much of what we learned in the class to the project. It’s incredible to look back and see how far we’ve come from first inception of the idea to a full



blown business plan and presentation. I never thought that I would leave college with the idea for a product that could eventually turn into an opportunity to really create something new!

6. I also enjoyed the one-on-one mentorship; this was invaluable.

Mentoring: Students are not initially aware of the processes necessary to take an idea from inception to a “final” product. To assist them, each student team meets with one of the professors weekly for up to an hour, where they are asked questions like, “What did you discover this week?” and “What further information do you need?” and “What are the next steps to make progress?” The faculty member is careful not to provide direction or solutions to the student teams, but seeks to help them discover for themselves how to proceed. Sometimes, the direction of the project takes a new turn as new information becomes available. A good example of one of these projects took the original idea of mining refuse dumps for recyclable materials (metals, glass, and plastic) and it became a project in processing vegetable oils as a fuel additive.

For those teams working on patent commercialization, they contact the designated representative of the sponsor company in addition to their weekly “in-house” meetings. This allows them to keep a firm grip on the topic and to have technical and marketing questions answered by a person who is very knowledgeable about the topic.

### **Projects that Students have Pursued**

The short time frame allotted for this class does not permit the full designing, building, and testing of any project prototype. Feasibility studies are generally all that time will allow. But there have been some very excellent ideas presented that will be mentioned here to illustrate the breadth and scope of student interest.

- Blood alcohol meter – the current breathalyzer system to determine blood alcohol content is fraught with possible erroneous readings because the alcohol percentage is inferred by the machine rather than read directly. Certain foods and personal products like mouthwash can indicate a high blood alcohol level when an individual has not consumed any intoxicating beverages. A portable meter similar to a glucose meter could be developed to take direct readings, eliminating the possibility of mistaken arrest.
- Potable water supply – using a fuel cell but reversing the flow direction and adding some electrical power can give rise to a portable potable water generator for use in disaster zones. Mounting an electrical generator on a pallet along with this fuel cell system could create a source of water during difficult times.

- Swing-out BBQ grill – mounted to the inside of a pick-up truck bed, this grill would swing out for use during tailgating parties. It has an adjustable height to suit varying terrains and swings away when not in use. A simple mounting device on the side walls of a truck bed allows the grill to be removed when the full bed is needed.

The authors will not discuss the two patent projects because of the proprietary nature of the product for the clients. However, one concerned an innovative approach to picture-taking with a camera, and the second concerned the application of Seebeck materials.

## **Conclusions**

In this paper, we have described how an extensive content regarding entrepreneurship and intrapreneurship can be fitted into a ten-week course with forty hours of instruction.

The conclusions reached by these classes indicate that (1) students can learn the basics of entrepreneurship and intrapreneurship in a class of forty hours, (2) faculty guidance in the form of mentoring is required for such a short term activity (but consumes a large amount of faculty time), and (3) journaling is vital to maintain a record of student thoughts and concerns throughout the project. Student feedback indicates that, even though the class is intensive, the value is exceptional and much is taken away.

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