

# A University Incubator as a Catalyst for Knowledge Transfer

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## ABSTRACT

Knowledge transfer takes place whenever the discoveries or expertise of academics are disseminated more widely. Knowledge transfer from universities to the wider public is an extremely important factor, however ideas and knowledge do not benefit the society, before they are shared.

Knowledge transfer can be done in many ways and in this paper a very practical approach is introduced by one efficient way of establishing a university business incubator. The university incubator will ensure diffusion of the knowledge transfer to the society. The incubator helps to induce entrepreneurship and commercialization in the community to such an extent that results are so convincing that more and more universities are becoming engines of economic development for their surroundings. Small business incubation provides assistance to companies which results in higher success rates for survival than non-incubated companies. Incubators can play a significant role as a catalyst for economic development by ongoing knowledge transfer.

An introduction to the University of Central Florida Incubation Program (UCFIP) is given, including its formation, specific goals, operational information and lessons learned and objectives of the program. Best practices are presented with an emphasis on the incubation program being a catalyst to the larger entrepreneurial ecosystem in the Greater Orlando region.

**Keywords:** University, technology incubator, knowledge transfer, eco-system, catalyst, economic development

## 1. INTRODUCTION

Knowledge transfer seeks to organize, create, capture or distribute knowledge and ensure its availability for future users. It is defined as “the process through which one unit (e.g., group, department, or division) is affected by the experience of another (Argote & Ingram, 2000). This term is typically used synonymously with the term ‘research utilization,’ which is the process of commercializing ideas, products, and services developed in academia.

Scholars are beginning to understand how knowledge is transferred from academia to the market, but there is still much to learn. A primary question in this area of inquiry is what role the university incubator plays in the transfer of knowledge. Assuming that the incubator actually plays a role, what practices work best?

This paper explicates the role that university incubators play in transferring knowledge from those who create it (academics in most cases) to those who utilize it for personal and public benefit (business people). It accomplishes this by examining an exemplar university incubation program, the UCFIP, and detailing their operating procedures. The most effective operating procedures are offered as ‘best practices’ to be evaluated and implemented by other university incubators.

This paper proceeds as follows. First, the concept of business incubation is introduced. Second, the history and record of the UCFIP story is delineated. Third, the practices (actual services offered to clients) are listed and explained. Fourth, how these practices result in knowledge development and transfer is discussed. Fifth, examples of the knowledge transfer. Sixth, a description of the current status of the UCFIP. Seventh, the implications for the ecosystem, and a discussion is given. Finally, conclusions and suggestions for future research in this area are given.

## 2. DEFINING BUSINESS INCUBATION

The Merriam-Webster dictionary defines an incubator or incubation as: “an organization or place that aids the development of new business ventures especially by providing low-cost commercial space, management assistance, or shared services”. Business incubators are programs that are created to spur the development of successful entrepreneurial companies. This goal is accomplished by providing various services for free or at a reduced cost. Services vary widely from incubator to incubator, but include one or more of the following: space, secretarial services, business planning and assistance, mentors, liaison services with angel investors or venture capitalists, grant writing assistance, and even financial assistance.

Business incubation is the process of providing these necessary services to nascent and early stage entrepreneurs. The goal of business incubation is typically to create successful entrepreneurial businesses within the community. Entrepreneurial businesses, as opposed to typical small businesses, are responsible for most new jobs (Kirchhoff, 1994; Birch, 1987). Further, the jobs created by incubated companies are far more likely to be enduring than others. The five year survival rate for the typical new business is not that high, whereas historically, 87% of incubator graduates surpass the five year mark (NBIA study, 1997, 2001). Further, the same study reports that 84% of incubator graduates remain in the same communities they were incubated in, and finally the study shows that for every 50 jobs created by an incubator client, 25 additional support positions are created in the community. Therefore, discovering and exploiting the best practices to accommodate and assist clients in developing their business ideas should be of primary importance to every business incubator, worldwide.

## 3. CREATION OF UCFTI - LATER THE UCFIP

The University of Central Florida Technology Incubator (UCFTI) opened its doors in 1999 after a long period of fertilizing and securing initial funding. The project was initiated by Dr. Thomas O’Neal, the Associate Director at the Center for Research and Education in Optics and Lasers (CREOL) (O’Neal, 2005). The need for a technology incubator became apparent in the mid 1990’s. The idea was accepted and supported by a few areas of the university including the office of the Vice President for Research, the College of Engineering, the Small Business Development Center (SBDC), the College of Business, and CREOL. At CREOL several professors had patented inventions that could be viable in the market and therefore needed support and an infrastructure to spin these technologies out of the lab and into a business ventures. The champion for this project had experience as a serial

entrepreneur. This knowledge was very beneficial in creating the framework and structure for the spin outs from the university. This framework ultimately resulted in creating the UCFTI.

From these auspicious beginnings the University of Central Florida has developed a network of incubators that have expanded from the one original entity, the UCFTI, into what today is called the UCFIP – the UCF Incubation Program. The program consists of connected incubators that have been created with the same framework as the UCFTI, thereby ensuring the same quality level and services offered, regardless of being spread out geographically over the Central Florida region.

Currently the UCFIP include five separate facilities and all facilities are today working together with other entrepreneurial resources that assist individuals and companies from the entire community to create successful new entrepreneurial ventures. The assistance of the individuals involved with this exemplar program has been sought by several foreign countries hoping to utilize the expertise developed by UCFIP management in setting up a similar framework for their own new local technology or business incubators.

The UCFIP uses the following definition of an incubator: “A facility and/or program that provide start-up companies with an environment and variety of services to help them grow more quickly and more successfully.” The incubator could be considered as a center for ‘hyper connectivity,’ where several different areas of assistance are coming together to add value for the clients, as well as the community.

## 4. BEST PRACTICES

The UCFIP provides many outstanding services to its clients such as: mentoring and advising in all aspects of business development and growth including business and strategic planning, legal counsel, accounting/tax, human resources, government contracting, strategic partnerships, marketing and PR, financing, grant preparation and insurance and risk management.

Additional services include:

- Access to experienced entrepreneurs through the Entrepreneur in Residence program
- Educational programs
- Marketing & PR support
- Networking opportunities with peer groups, area professionals, University faculty, and support organizations
- Complimentary memberships in a variety of organizations
- Adaptable space and flexible leases in several locations in the Orlando area

- Connections to UCF faculty and labs, library, and support organizations
- Shared reception, office equipment, conference rooms, and other support services.

All these above listed services are provided for the clients to meet their particular needs in real time in the constant quest for the clients' success and continuous growth.

## 5. KNOWLEDGE DEVELOPMENT AND TRANSFER

According to Dr. David A. Sampson, Deputy Secretary of the U.S. Commerce Department, "Universities share a critical role in securing America's future innovation, economic competitiveness, and prosperity in a global economy." A key part of that role is transferring the knowledge created within the university to the market. In supporting a business incubator, universities deliver core business knowledge to those individuals and firms that are most eager to utilize it. In addition, the presence of an incubator gives individuals within the university structure an outlet for their business ideas, patents, and copyrightable materials.

The proximity of the incubator and the community to each other, as well as the frequent interaction that this proximity affords leads to the development, sharing, and ultimately the transfer of ideas. At the UCF, this proximity is generated by university/community interaction at both the undergraduate and graduate level. Some examples are provided in the table 1 below:

**Table 1** Tools, programs and activities initiated by UCFIP for students and the community

<b>The UCF / Orange County Venture Lab</b>	
	Assists more than 200 students, faculty, and community entrepreneurs by vetting, developing, conducting market validation, and coaching and mentoring services to start-up or early stage companies
<b>The UCF Office of Economic Development</b>	
	UCF established the Office of Economic Development in 2000 and collaboratively works with the Metro Orlando Economic Development Commission to train the future's workforce.
<b>The UCF Institute for Economic Competitiveness</b>	
	Since 1998, the mission of the Institute has been to sustain a healthy relationship between academia, business, and government. It serves commerce and government as a single point of contact with economic information resources. The goal is to expand public understanding by convening business leaders, scholars, policy makers, civic groups and media to discuss critical issues at the intersection of academia, business, and government
<b>The UCF Center for Entrepreneurship and Innovation (CEI)</b>	
	In 2005, the CEI was formed as an initiative by the UCF College of Business Administration. The CEI offers training to those who create and lead new business ventures, by providing educational programs, research facilities, networking opportunities, business plan showcase events, and access to business leaders. The

	CEI efforts foster an expanding network of mutually beneficial university, business, and government partnerships that promote Central Florida's economic development and quality of life. The CEI has close collaborations with the UCF Venture Lab.
<b>Undergraduate and Graduate level Entrepreneurship Curriculum and majors, approximately 11 courses, estimated more than 700 students enrolled 2007-08:</b>	
<b>Undergraduate</b>	
	- Track in Management Major (24 credits) - Minor for Business Students (18 credits) - Minor for Non-Business students (18 credits) - Minor for Technological Entrepreneurship (Proposed )
<b>Graduate</b>	
	- MBA Concentration - Entrepreneurship Certificate - Technology Commercialization Certificate
<b>Initiatives under development</b>	
	- Centralized source for internship placement for small businesses (with Experiential Learning) - Small business insurance program (with DEC) - Urban Entrepreneurship program
<b>Entrepreneurship Boot camps</b>	
	<b>Annual Invention to Venture</b> Partnership activity with National Collegiate Inventors & Inventors Association. One day boot-camp for Innovation based businesses
<b>Business Plan and Quick Pitch competitions</b>	
	<ul style="list-style-type: none"> <li>○ <b>King of the Court</b> College of Business (COB) and Office of Research (ORC) partner in giving a Business opportunity quick pitch competition.</li> <li>○ <b>Joust</b> (\$20-25K raised in external funding for event this year) Annual Business plan competition with prizes that include cash raised from external sources and incubator support</li> <li>○ <b>Sunshine State Venture Challenge</b> State wide business plan competition led by UCF-CEI in COB</li> </ul>

## Knowledge transfer mechanisms

Traditional licensing of technology from the university is facilitated by the incubator via closer interactions between inventors and companies. University personnel often have relationships with the companies that range from consulting to ownership positions. The proximity to the research lab greatly increased interactions.

Joint research projects with incubator companies and researchers provide a very effective knowledge transfer mechanism. Research programs such as the Small Business Innovative Research program (SBIR) provide funding to small business concerns. By teaming up with university researchers, incubator companies can leverage the resources of a university to increase their competitiveness. Intellectual property and know how flows from the university to the small company.

Additionally, much of the funding is used to hire graduate students to work on the projects. These students become familiar with the research product and are often hired by the small companies when they graduate. This provides a very effective knowledge transfer medium as the new

employees are well versed in the intellectual capital created during the research portion by working directly on the project and by helping to get the knowledge transferred from the researcher as well via the student / teacher relationship.

In addition to the technical based transfer, incubation also creates a very effective environment for transfer of business oriented knowledge. This is done via traditional methods such as business seminars and training programs but is augmented with specialized programs such as student internships and entrepreneur in residence programs. Serial entrepreneurs provide one on one coaching and mentoring of incubator clients providing real time, real world advice, addressing the pressing issues that incubator client’s daily face.

The knowledge transfer also takes place through partnerships between UCFIP and industry leaders and here by creating a culture of entrepreneurship. Entrepreneurship is the essence of entrepreneurial capital, and it is an essential element of any long-term economic transformation effort. Being part of a larger entrepreneurial eco-system that includes creative people with an entrepreneurial spirit, effective technology transfer, technical assistance, and a pipeline of new companies that grow out of research – it all is a result of knowledge transfer.

Another way to transfer knowledge or assist the continuous process of knowledge transfer is through support programs and funding to students and incubator clients/entrepreneurs. One major entity that has been instrumental for the UCFIP and its clients has been the Florida High Tech Corridor Council (FHTCC). FHTCC makes extensive use of partnerships and alliances, motivated by a shared set of beliefs and values regarding the benefits of research-based entrepreneurship, and in this way fulfilling FHTCC’s own goals and objectives. Its major initiative, the matching industry grants program, requires university researchers to form alliances to be eligible to participate in the program. This initiative spurs knowledge sharing with several different parties that probably never would have shared knowledge under different circumstances. Below a few examples of FHTCC’s contributions to the evolution of entrepreneurial capital/culture and knowledge transfer in the region is listed:

- Funding of community colleges to develop programs between community colleges and universities in the Corridor
- Funding of six incubator programs to encourage their community outreach activities
- Sponsorship of numerous activities and organizations and centers, especially Disney Entrepreneur Center
- Development of a virtual entrepreneur center in partnership with Volusia County

## 6. CURRENT STATUS OF THE UCFIP

The UCFIP has the following mission for its existence: “A university driven community partnership dedicated to providing early stage technology companies with the enabling tools, education, training and infrastructure necessary to create financially stable, high growth enterprises”. This was the original mission for the incubator and as of writing this the UCFIP has assisted more than 90 firms. It is home to 60 current clients and has graduated 26 companies where 25 still is in the region. The remaining companies have dropped out of the program for various reasons ranging cash flow issues to a desire to start a new company in a different market space.

The original UCFTI was named the Incubator of the Year in 2004 at the National Business Incubator Association’s annual conference, and it has been placed in the top ten in terms of revenue growth and jobs created for several years in a row. In summary, over the first eight years, the results from the program is listed in table 2:

**Table 2:** Current results from UCFIP clients:

Jobs created	> 900
Average salary	\$58,000
Investment raised	\$150M
Generated revenue	> \$200 M
Patents held by clients	286
Copyrights held by clients	74
Trademarks held by clients	47
Trade secrets held by clients	64
Companies currently in program	60+
Companies graduated	26, 25 still in region

The following list shows the diversity of the industries that the UCFIP has clients in currently and has graduates from:

- Biomedical
- Digital Media
- Education/Training Technology
- Engineering Products/Services
- Environmental Products/Services
- IT Products/Services
- Materials Products/Services
- Optics/Lasers
- Simulation/Modeling/Training
- Telecommunication

## 7. UCFIP AND THE SURROUNDING ECO-SYSTEM

A key to success for an incubator appears to be the network of

partners, service providers, and entrepreneurs that contribute to the program, access to the resources of a large research university, and a healthy or beneficial reputation as the place to go to start a high tech company. The reputation benefits have been the key for attracting increasingly sophisticated and successful clients. A positive feedback loop has been established in the sense that better companies add to the credibility of the incubator, attracting better clients that further add to the credibility, and so on. The current client admission process to the UCFIP is a class called "Excellence in Entrepreneurship" which is a twenty-one hour selection process, consisting of seven days of three hours. This course has proven to be an effective self filtering process, while the participants get a good understanding of what the future holds for them based upon those topics in the course. This course also shows the incubator management whether the future clients are coachable, which at UCFIP is considered a very important personality trait for a future client. This course is a filtering process to ensure high quality clients that fit the UCFIP management's style.

The incubator entity is a fully functioning part of a larger incubation system that again is part of the eco-system for the UCFIP. It is however, one of the more visible parts of the system that facilitates and catalyzes much of the high tech economic development activities of the region, particularly when the university is involved. It is a tool for the university's technology transfer activities and the region's local economic development partners. Local Angel and Venture capital firms view the incubator as a place to find the best investment opportunities and appreciate the monitoring services provided by the incubator program. The eco-system for the UCFIP consist of: The current five incubator entities, the research university, the UCF research park (which now actually is one of the 10 biggest in the country), access to resources outside the region, the community with moderate level of resources, the local service providers, the entrepreneurial community with its new technologies, and funding sources. Additional community based infrastructure such as effective air and land transportation also play a major role in this eco-system. All those interacting entities continuously impact the success of the incubation efforts in the Greater Orlando area.

## **Discussion**

In terms of how an incubator program can become a catalyst for economic development, the original UCFTI addressed many unmet needs of the region. In some cases it was able to act as a focal point for local resources that were spread out across the region and not easily identifiable to new entrepreneurs. Entrepreneurship and the culture of creating companies was not a regional priority prior to the UCFTI.

The Greater Orlando area had a demand for help in creating the same kind of technology based economic support systems that regions such as Silicon Valley and Boston enjoy. The region's leaders also began to realize that overdependence on tourism and hospitality was undesirable. The success of the incubator created awareness among political and economic development agencies that there was a third option to economic development beyond recruitment and retention that added creation to their strategies.

## **8. CONCLUSION**

Incubation of companies is a very positive process that has a positive impact on so many parts of the society in general. Small businesses are the heart of the United States economy. Research by the Office of Advocacy shows that small businesses creates most of the nation's net new jobs, and they bring dynamic ideas, innovative services, and new products to the marketplace. They account for almost all of the nation's employer firms and generate half of non-farm private output. New business creation is a key factor to increasing gross national product, personal income, and total employment.

The original UCFTI is a perfect example of how much such an entity can change the surrounding community and raise the involvement and foster economic development on a level that goes beyond the region it serves. The influence which the UCFTI has had on the region is probably the reason many different countries now get in contact and would like to acquire assistance so their own incubator will be running as smoothly and with as much success as here. It is important to note however that an incubator in itself is less likely to have the kind of effect that the UCFTI/UCFIP and Central Florida has enjoyed. The success seems to be based upon the aligning of the different entities in the Greater Orlando area, thereby aligning the UCFIP to the larger eco system where every contributing

partner supports the incubator strongly and can see the relevance and the importance of UCFIP's existence in the community. The incubator identified and filled many of the existing gaps in the community's larger entrepreneurial ecosystem, and the UCFIP is now an integral part of a much larger creation based strategy which the community strongly supports.

The UCFIP is very aware of the fact that every client is different and has different needs. Trying to determine what is the right amount of support for a client and in what way it should be provided varies tremendously from client to client. Realizing this fact is what defines a quality incubation program. Incubation is a process, not a facility. Some general support mechanisms can of course be developed but they might not provide the support/help that the specific client actually requires and it is those uncertainties that demand a continuous guidance and support system through the incubation period. Entrepreneurs deal with the real world every day and they need support that is appropriate, timely, and easy to locate.

There is a continuous search for new ideas for improvement at the UCFIP and a research position in the incubation topic has been created with the goal of designing even better and more efficient processes for evaluating and accommodating the incubator clients. This research takes foreign studies into account in the hope that there will be some new procedures that can be implemented to the current incubation process – in the constant quest for the continuous improvement of daily processes and services.

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