



UNIVERSITY of
HOUSTON



CICEP

INNOVATION AND ECONOMIC PROSPERITY UNIVERSITIES
AWARDS PROGRAM

CASE
STUDY
2014

Working for the Future

Responding to the Workforce Needs of Tomorrow

One of the central goals of economic engagement at UH is to effectively respond to the workforce education/development needs of the local community. As such the majority of UH workforce development initiatives have focused on the **energy**, community **health** and the **arts** sectors. This has included formation of: petroleum engineering, sub-sea engineering and construction management programs at both undergraduate and graduate levels;

Energy Sector Workforce Development	Talent (T), Innovation (I), Place (P) or Connections	Timeline	Resources	Indicator/ Measure of Success
Undergraduate Petroleum Engineering Program	(T,I,P) Education, Workforce Development, Entrepreneurship, Community	2009-present	UH, State of Texas, US DOT, Internal UH funding; \$3M from ConocoPhillips	Program infrastructure created at ERP formed; Approved by THECB; 2009 2014 enrollment >500 students
Awarded TIGER Grant	(P) Community	July 2012	\$15M Grant (US Department Transportation)	Infrastructure to facilitate student movement between ERP and Main Campus
Subsea Engineering Certificate Program; MS Program	(T) Education; Workforce Development	Sep 2012	Donation of subsea training model from General Electric; State of Texas	Created only subsea engineering program in US, and one of only 5 in world
Ocean Energy Safety Institute (OESI)	(T,P) Education; Workforce Development; Environmental	2013-2018	Partnership with Texas A&M, UT-Austin; \$5M grant US DOI	Public-private partnership, center of expertise for offshore operations

a formation of a **Health Sciences Center** and fast-track academic programs in **medicine** and **nursing** with professional programs in physical therapy, **athletic training** and **human space flight operations** and;

Community Health Sector Workforce Development	Talent (T), Innovation (I), Place (P) or Connections	Timeline	Resources	Indicator/ Measure of Success
Formation of UH Health Sciences Center Health & Biomedical Sciences Buildings	(T,P) Education; Workforce Development Community	Feb 2013	Private donors; Texas State Optical	Multi-disciplinary facility for clinical educational and research activity
BS-MD Fast-track Program	(T) Education; Workforce Development	Sep 2013	In partnership with UT Health & UTMB	2013 1 st class enrolled. (23 Honors students)
BA-BSN Fast-track Program	(T) Education; Workforce Development	Sep 2013	In partnership with UT Health	2013 1 st class enrolled.
MS in Athletic Training	(T) Education; Workforce Development	Sep 2013	Partnership with NASA-JSC & Memorial Herman	2013 1 st class enrolled.
MS in Human Space exploration Sciences	(T) Education; Workforce Development	Sep 2010	Partnership with NASA-JSC and space exploration industry	2010 1 st class enrolled.

Establishment of the [UH Center for Arts Leadership](#) and a graduate program in Arts Leadership focused on arts entrepreneurship. While these programs respond to challenges faced by established industry sectors, one common element critical to ensuring the continued success of all these sectors is “**innovation**”.

Arts Sector	Talent (T), Innovation (I), Place (P) or Connections	Timeline	Resources	Indicator/ Measure of Success
Workforce Development				
Formation of UH Center for Arts Leadership	(T,P) Education; Cultural	2013	Students, artists, curators, philanthropists, Houston Endowment	Convened Arts Leadership Summit
Creation of Master of Arts in Arts Leadership	(T,I,P) Education; Workforce Development	2013	Internal to UH	Created MA program
UH Center for Arts Leadership Convenes Summit	(T,P) Education; Cultural	2014	Students, artists, curators, philanthropists, Houston Endowment	Convened Arts Leadership Summit
UH & Alley Theater Partnership	(T,I,P) Education, Workforce Development, Cultural	2008-present	Wortham Theater complex at UH, Alley Theater, Houston, TX.	Graduate student observer-ships with stage professionals; 2014-2015 Season (68 th) performed at UH theater; student observer-ships
Texas Music Festival	(T,I,P) Education, Innovation, Cultural	1990-present	Moore School of Music, guest conductors, Houston Orchestra	Orchestral Fellowship Program
Houston Shakespeare Festival	(T,I,P) Education, Innovation, Cultural	1975-present	UH, philanthropists	Free theater for 500,000 people

In a world dominated by an “innovation economy”, the U.S. suffers from a significant “innovation gap”. Entrepreneurship to support technology innovation is critical to the future economic prosperity of the nation. Ensuring that technically qualified workers understand and embrace entrepreneurship is equally important to future economic gains regardless of industry sector. To address these challenges, UH has developed a range of integrated, cross-disciplinary academic/experiential programming to provide both faculty and students with the “entrepreneurial” tools required to support technology innovation. Actively seeking local entrepreneurial community involvement in developing such programs has helped build capacity for commercializing both internal



Wavve, a finalist at the 2104 DOE National Clean Technology Business Plan, also won \$51K in cash and additional services in three other national B-plan competitions. The Wavve team has now founded a start-up company located at UH-ERP.

and external IP while serving to launch young UH-trained innovators/ entrepreneurs into the larger innovation ecosystem.

Exemplifying this strategy is a joint program between UH [Division of Research and Technology Transfer](#) and the Wolff Center for Entrepreneurship (WCE) in UH Bauer College of Business. This program originally partnered faculty inventors with undergraduate entrepreneurship students to assess the commercial potential of UH technologies by analyzing factors such as market size, competing products, barriers to adoption, supply chain issues and financial models for technology commercialization. Over the last two years, this program has evolved and expanded to include graduate students familiar with the technical aspects of the subject IP and students from the UH [Valenti School of Communications](#) enrolled in an [academic class](#) on entrepreneurial messaging specifically developed to support this joint program. The capstone of this year long experience is for these multi-disciplinary entrepreneurial teams to develop business plans around specific UH technologies for national business plan competition. To date, several WCE entrepreneurial teams have enjoyed significant success in national business plan competition, with six teams winning in aggregate nearly \$300,000 in prize money/enterprise services.

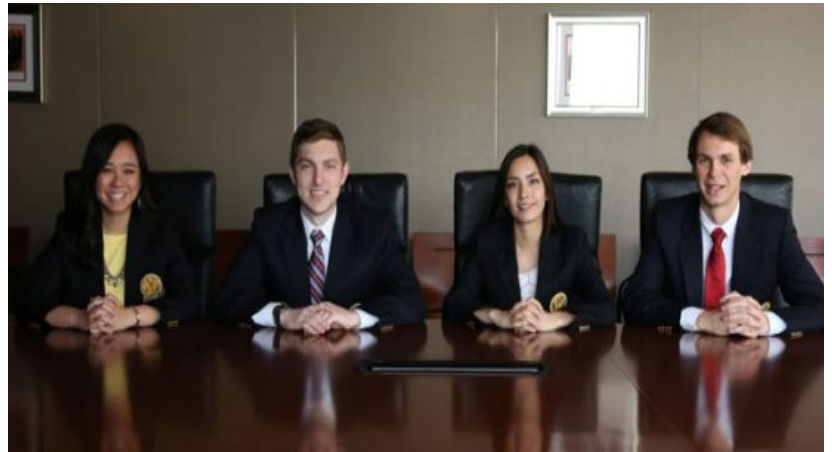
In addition, two teams ([REECycle](#) and [Wavve](#)) were chosen as two of only 12 teams selected to participate in the [2014 DOE National Clean Technology Business Plan](#), where REECycle went on to win all three awards available at the competition. Both teams have now founded UH start-up companies (REEcycle, LLC and WavveStream, LLC) using the publicity gained by exposure on the national business plan circuit to attract potential investors and secure initial seed funding. A third WCE team, [MIROS/ARMS](#) generated a pitch instrumental in the decision to create a joint venture with Fannin Innovation Studio (FIS) to commercialize a real-time MRI guided robotic surgery technology. In addition, several WCE graduates are now serving as founders of non-UH related start-ups or working with other local innovation organizations such as Platform Houston or the Rice Alliance. In addition, FIS has also agreed to provide students who have completed entrepreneurial training at UH with paid internships for up to one year to work with FIS portfolio companies primarily located in the Texas Medical Center.

A second example of this strategy is the establishment in 2013 of the STEM-Business program (**STEM-B: The Fifth Element of Innovation**). This partnership between UH's Division of

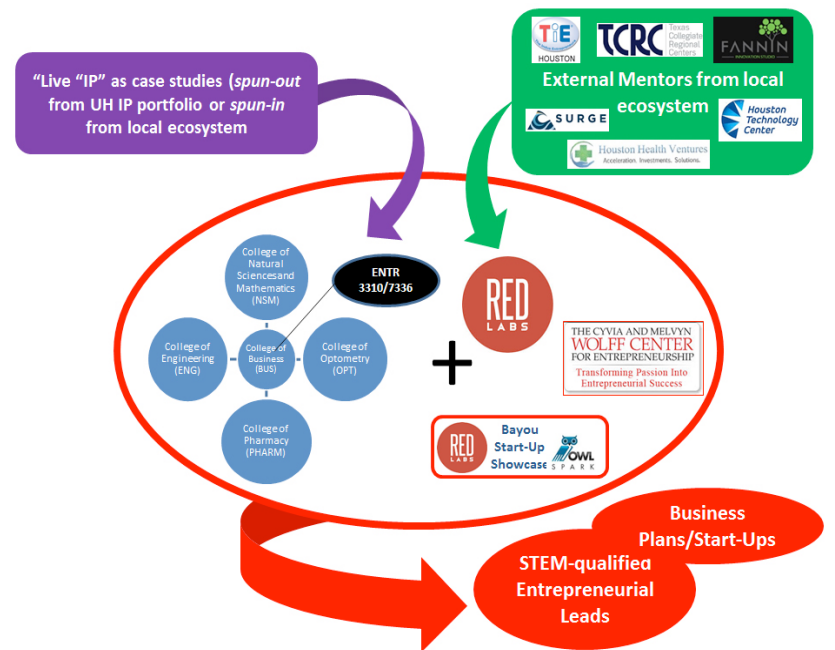


Research and Technology Transfer, the Colleges of Natural Sciences & Math, Engineering and Business and the UH Graduate School targets graduate students in the STEM disciplines interested in entrepreneurial training. **STEM-B** consists of: 1) a formal academic class ([ENTR 3310/7336](#)) utilizing “live” IP as case studies based on the lean start-up model pioneered at Stanford and adopted by the NSF I-CORPS; followed by 2) membership in an entrepreneurial team participating in the WCE program, UH’s [RED Labs accelerator](#) or a new “*first-of-its kind*” accelerator program created by UH RED Labs and Rice University’s Owl-Spark Accelerator ([Bayou Start-Up Showcase](#)). Recruitment of Dr. Martin Lindenberg, Founding Chairman of the [Houston Technology Center](#) (noted twice in recent years by Forbes as “*one of the ten incubators changing the world*”) to develop/deliver ENTR 3310/7336 at UH has served to integrate this program with the external community. Offered twice over the past academic year, students from the **STEM-B** program have formed two entrepreneurial teams that graduated from RED Labs, one of which has founded [Luminostics, Inc.](#), a UH start-up which has already received I-Corps accelerator funding, submitted an NIH SBIR and is the process of negotiating a technology license with UH.

Early successes with this innovation workforce strategy have been informative in guiding future efforts in this domain. To date, lessons learned from both the WCE and **STEM-B** initiatives include the importance of: 1) recruiting faculty inventors as advocates in STEM student recruitment efforts; 2) regular informational/out-reach events at the departmental level; 2) inclusion in each entrepreneurial team of at least one graduate student with technical expertise in the subject IP (preferably being mentored by the inventor) to provide both effective “peer” learning and a highly reliable means of communication with the faculty inventor; 3) providing an “*a priori*” academic experience in the basics of technology commercialization to students from



[REEcycle](#), grand-prize winner at the 2104 DOE National Clean Technology Business Plan, won \$125K in cash and additional enterprise services in two other national B-plan competitions and has founded a start-up company located at UH-ERP.



the STEM disciplines; and 4) selecting external mentors with direct experience in technology development related to the subject IP/technology in order to increase the effectiveness of the entrepreneurial team.

In summary, by creating novel, cross-disciplinary programing specifically designed to develop the next generation of innovators/entrepreneurs, be they drawn from the STEM, business or communications disciplines, UH not only helps drive economic prosperity of the local and regional economies, but also helps close the larger “innovation gap” critical to ensuring the future success of nation.