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# Industry-university partnership through experiential project-based learning: A Singapore case study

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## CASE STUDY OVERVIEW

|                          |  |
|--------------------------|--|
| <b>Title of the case</b> | <b>Industry-University Partnership Through Experiential Project-based Learning: A Singapore Case Study</b>   |
| <b>Sales pitch</b>       | A radical approach to preparing university students with future work skills, by combining academic with experiential learning through real projects faced by client partners. Learn how a university can create opportunities for collaborative learning and a tripartite learning relationship for academia, students and industry. |

Presented at Asia-Pacific University-Industry Engagement Conference 2017, February 15-17, Adelaide, Australia

## CASE STUDY PROFILE

### 1. BACKGROUND & OBJECTIVES (1000 TO 4000 CHARACTERS)

**Describe the background and/or context for the case including the development of the institution(s)/organisation(s)/network(s) up until the point of the case. Please name the primary objectives of the program/initiative/strategy.**

#### **Background**

The scale and complexity of challenges facing the world today call for integrated solutions across a wide range of disciplines. Our education system needs to produce students who can adapt and deal with complex problems nimbly and creatively. This calls for a radical transformation of education in order to equip graduates with relevant future work skills.

The Future Work Skills 2020 report released by the Institute for the Future in 2011 has identified transdisciplinarity as well as novel and adaptive thinking as skills important to the future workforce. Transdisciplinarity involves drawing from several disciplines to redefine problems outside normal boundaries and reach solutions based on a new understanding of complex situations. Novel and adaptive thinking refers to the ability to problem solve, think outside the box and come up with tailored solutions. Mastery of these skills requires collaboration between relevant entities in devising effective solutions to address complex problems.

As a country, Singapore too has launched a national movement called 'SkillsFuture', which emphasises the importance of such skills as 'real world work exposure' and 'managing collaboration with industry partners, to help its citizens respond effectively to changing workforce needs. This has strong implications for tertiary institutions. Universities need to integrate industry experience with learning in classroom, and more importantly, work closely with businesses and adapt their curricula to the rapidly evolving needs of the industry.

#### **The Initiative: SMU-X**

The Singapore Management University (SMU), a young University established in Year 2000, addresses this through the creation of a cutting edge, university-wide approach for undergraduates called 'SMU-X'. It is the first in Asia-Pacific to integrate these evidenced-based principles within a curriculum module:

- Project-based learning through tackling current, unresolved problems and issues
- Active mentoring of students by faculty and industry partners
- Interdisciplinarity in curriculum and learning design
- Closer collaboration between students, faculty and external partners

A SMU-X module combines academic with experiential learning through heavy use of projects aimed at solving current issues faced by industry partners. Conducted over one semester (15 weeks), it challenges students to use their disciplinary knowledge and skills to tackle real world problems through interdisciplinary approaches and activities. Active mentoring from the faculty and external partners provide students with opportunities for collaborative learning, interactive experiences, access to subject-matter experts from academia and industry, peer and social

exchanges, and a deepened understanding of diversity and interconnectedness. In the process, students are equipped with a broader set of skills beyond those acquired in the classroom, which enhances their employability in the global marketplace.

### **Primary Objectives**

The SMU-X pedagogy promotes close collaborations between faculty and industry partners, thereby integrating theory and practice more fully. These interactions result in a learning loop for the tripartite:

- Students obtain a deeper understanding of what it means to apply theory learnt outside the classroom
- Faculty learn how real world adapts theory
- Industry partners deepen their own learning methodology and appreciate the value of continuing education

SMU believes that the following skills are inculcated in students' learning process through SMU-X:

- Ability to see connections and differences across disciplines and to integrate knowledge to explore an issue or meet a challenge
- Adaptability to new or unfamiliar environments and to exercise leadership
- Creative and critical thinking when solving problems
- Sound decision making while managing complex situations
- Ability to work collaboratively and productively as a team

These learning outcomes are aligned to the major skills highlighted in both Future Work Skills 2020 and SkillsFuture.

## **2. STRATEGY & ACTIVITIES UNDERTAKEN (1000 TO 4000 CHARACTERS)**

**Please describe the case in terms of the strategies behind the case and then the actions / activities undertaken.**

SMU adopted an experimental approach to creating SMU-X.

### **Phase 1: Conceptualising**

Having established the want to enhance our education methodology, a small group of forward thinking academics and administrators were assembled under the direct supervision of the President of the University. SMU-X as a model was proposed and accepted after evaluation of the University's strengths, differentiating factors and future strategic areas of focus in line with the University's 2025 Vision. The taskforce identified experiential project-based learning as a natural extension of the already interactive teaching pedagogy that SMU adopts currently. Consultations were held with major stakeholders to refine the SMU-X concept.

### **Phase 2: Piloting**

SMU-X piloted in January 2015 with two courses and 58 student places. Enthusiastic faculty were recruited and qualitative feedback from both client partners and students were very positive. This gave the implementation team confidence to scale up to 12 courses in August 2015.

### **Phase 3: Scaling up**

It was always the intention of SMU to scale up SMU-X so that every undergraduate has the opportunity to take such a course. By August 2016, 1.5 years since the pilot, SMU-X had grown to 26 modules and 2,320 places. SMU-X modules were oversubscribed, which indicated a high demand. 270 student projects have been carried out for 122 organisations from a variety of industry sectors. 71% of our partners were from private sector, 20% were Non-Governmental Organisations (NGOs), and the remaining 8% were from public sector. Among those from the private sector, 32% were Multi-National Corporations and 56% were Small and Medium Enterprises.

There are several themes covered by SMU-X modules. Details of 2 SMU-X modules that have reaped successful partnerships are provided below.

#### **1. Smart Finance: Intelligent Accounting Function**

This module looks at how accounting/finance functions are rapidly becoming "smarter" to help companies achieve cost-effective operations and support higher value business activities. Students learn what comprises a highly optimised accounting process, design an end-to-end

process management, and explore underlying accounting IT systems and advanced data analytical applications and work closely with instructors from accounting and information systems disciplines to develop intelligent accounting function solutions for client partners.

**a) Client: DFS Venture Pte Ltd (2015)**

The project focused on developing a performance measurement programme that was comprehensive and metrics-driven - a balanced scorecard that included key financial and non-financial performance metrics, targets and a driver map that linked each metric to an overall strategic business objective. The scorecard could then measure the performance of the finance functions and find out whether the operations aligned to DFS' strategic goals.

DFS indicated that the collaboration was beneficial as it obtained a solution to a business problem that they were facing. Mr Gurbinder Singh, Vice President, Global Shared Service Center of DFS Venture Singapore (Pte) Ltd, commented, "Collaborating with SMU students and their professors to establish an intelligent accounting function presents a unique opportunity for DFS to enhance customer experience. We look forward to engaging these enthusiastic students as they apply creative concepts to develop practical solutions for our business."

**2. IT Solutions: IS Application Project**

This capstone module lets students work on client projects and to implement, test and deploy their information systems skills with real users in deployed environments.

**a) Client: The Nielsen Company (2016)**

Nielsen has a web application that supports its global mentoring movement. SMU created a platform to automatically match mentors and mentees via a unique matching algorithm achieving better user choice and increase ease of monitoring. The tested platform enabled over 30 matches in more than 80 global users from 16 countries. The student team was commended by Nielsen's Executive Director, Ms Joan Heng, who said: "We are very pleased with the outcome and very proud of the students. They completed the project on time and to our expectations. We will roll out this project globally so that matching can be done across regions and countries."

**3. OUTCOMES / IMPACT (1000 TO 4000 CHARACTERS)**

**What are the concrete outcomes / deliverables that have come out of the case? Please try to be precise and use lists rather than text paragraphs. What sort of impact (benefits or disadvantages) has the program had on stakeholders both direct and indirect? Where possible, please provide statistics or examples and separate short and long-term impacts.**

Post-module feedback surveys conducted over AY2015/16 showed that over 80% of the students who took an SMU-X module reported enhanced problem-solving, analytical, reasoning and communication skills, all of which were skills highly valued by employers. These results also dovetailed with SMU-X's learning outcomes. More than 85% felt that the SMU-X module met their expectations and would recommend it to their peers and juniors. Students also appreciated the chance to extend their learning beyond hypothetical classroom exercises, while companies learnt and benefitted from fresh perspectives provided by students and faculty. Below are some examples of qualitative feedback received from students and client partners:

- "This course has allowed me to apply what I know to a real-life problem, while the opportunity to work in cross-function teams closely mirrors how we are expected to work in the real world. The process of brainstorming for solutions to the project really was an eye-opener, as it exposed me to viewpoints and opinions I would not have thought about, particularly since my other group members have had really different experiences and education from myself." - Student from Managing Information Systems for Business Value
- "SMU-X courses provide an essential link for students to apply what they learn in the classroom to real world business issues. On the other end, businesses benefit from a set of fresh eyes from a third party observer who can identify opportunities and inefficiencies and communicate them in a manner free from corporate hierarchy." – Mr John Ang, CEO, VRM Biologik (client partner for The Design of Business)

Besides these encouraging response, SMU-X's pedagogical approach to enhance presence learning and prepare students with future work skills received support from Singapore's Ministry of Education in the form of a Tertiary Education Research Fund (TRF) grant in November 2015. The TRF grant supports applied educational research on a competitive basis across institutions of higher learning in Singapore.

SMU-X's innovative pedagogy has also been lauded by global accreditation body Association to Advance Collegiate Schools of Business International as one of the "Innovations That Inspire". SMU is the only institution in Singapore, and one of the three in Asia to be recognised. At the Straits Times Education Forum held on 25 June 2016, Mr Ong Ye Kung, Singapore's Acting Minister for Education (Higher Education and Skills), cited SMU-X as an example of real-life learning which provided the environment for students to gain both depth and breadth in their skill sets via involvement in industry projects.

SMU endeavours to be Asia's leading university in experiential project-based learning. Besides sharing its model with institutions in the region, SMU would like to foster global partnerships and joint programmes with peer universities. In pursuit of excellence, SMU will continue to seek external funding to conduct research on the SMU-X learning model so as to hone it further. One of the least explored yet most challenging areas in higher education is assessment of project-based learning. This is largely due to the open-ended, authentic and complex nature of the projects that students undertake. Each project is unique in terms of technical- and people-related challenges, as well as the amount of personalised learning. Therein lie valuable research opportunities which will further strengthen the efficacy of SMU-X pedagogy.

Operational-wise, client recruitment and management processes will be introduced to strengthen client engagement. Efforts will also be dedicated to help students learn how to communicate and work better with client partners through "pre-reflection" activities such as having introductory presentations to walk them through the challenges prior the start of each module. Successful students from past modules will also be invited to share their learning experience.