Novel Educational Programme: A Chemist Entrepreneur

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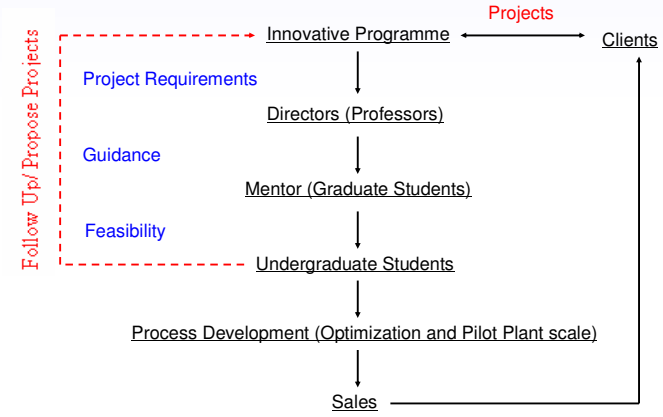
Introduction

The "Innovative Programme" is implemented at the National University of Singapore as an enterprise promoted and operated by undergraduate students of the Science Faculty. Innovative Programme is a totally student-initiated programme which is supported by the Faculty of Science as well as the Department of Chemistry. The programme is a 'training company' concept that is based on a ***Problem-Based Learning Curriculum***[1] with ***authentic tasks***[2] built upon a ***COOPER framework***[3]. It presents an opportunity for undergraduates not only to be trained in management, entrepreneurship and chemical processing skills under the recognition of Undergraduate Research Opportunities Programme in Science (UROPS) but also acts as a platform for them to distinguish themselves during the semester term.



Programme Structure

Problem-Based Learning Curriculum

Cultivate students to construct an extensive and flexible knowledge base, foster effective collaborating between members, develop independent learning skills, becoming effective problem solvers and the innate motivation to learn.

Authentic Tasks

Assignments that are relevant to the real world with a strong similarity to task being performed without an educational aspect such as the workplace are given to undergraduates.

a) Research projects serve to increase students' technical competency.

b) The programme being designed to function as a full structured company, will then teach learners essential skills not acquired through textbook but sharpened by nature of work and diverse experiences, such as interpersonal communication, problem solving, conflict resolution and supervisory techniques.

*More details can be found on http://www.chemistry.nus.edu.sg/appliedchem/Innovative_Programme

COOPER Framework

The COOPER framework has three aspects namely the Pre-Programme, Development of Programme and Post Development Programme.

a) Pre-Programme

Learners are assessed to differentiate them. Necessary infrastructure will be provided in terms of academic mentors (Professors) and a customised 1 week training programme will be carried out as an induction programme for efficient technology transfer.

b) Development of Programme

Using the Undergraduate Research Opportunities Programme in Science (UROPS) schedule, research projects are defined and produced. For development of the enterprise, milestones and deliverables of tasks (Short & Long Term) assigned to members are defined and produced which are based on the roles of stakeholders.

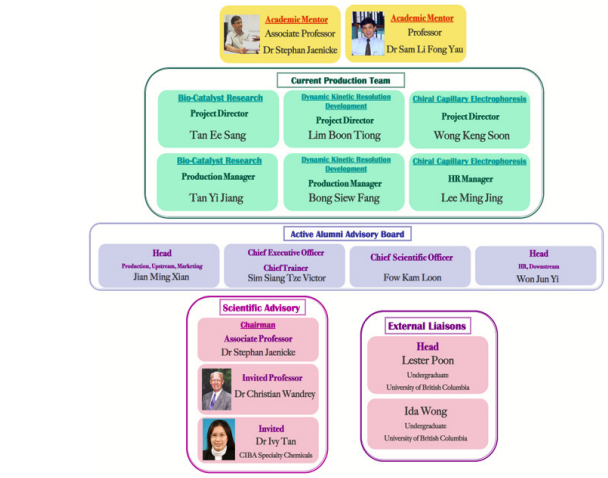
The set up of an online sharing Wiki platform will help to facilitate the sharing of past experiences from similar research projects or tasks as well as the availability of an online database for easy contacting of active experts and alumni for advice.

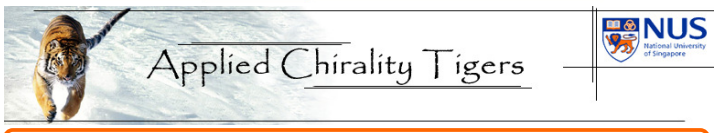
c) Post Development Programme (Knowledge Management Opportunity)

Online Wiki platform for sharing the knowledge and contribution of potential follow up research projects.

Future tasks for the development of the enterprise are to be recommended for the next batch of undergraduates to take over.

Organization Chart





Conclusion

With achievements such as the successful implementation of a 1 week training workshop that inculcates the importance of production planning (Human Resource and Equipments), cost effectiveness and time management for process development and possessing the capability to synthesis multigram of Ethyl (*S*)-3-Hydroxybutyrate (Enantiomer Excess > 97%) by Baker's Yeast fermentation, this programme is poised for greater success when 3 on-going research projects is scheduled for completion coming end 2007. Possessing tremendous educational aspect in providing a conducive environment for entrepreneurship training, this programme has great support from NUS Department of Chemistry.

References

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