

STRATEGIC ISSUES IN SCIENCE COMMUNICATION TO YOUTH: APPLICATIONS IN BIOTECHNOLOGY AND BIOENGINEERING IN AUSTRALIA

Henry C.H. Ko^{1,2,*}, and Jean C.C. Hsu^{2,3}

¹ Graduate School of Biomedical Engineering, University of New South Wales, Sydney, New South Wales, 2052, Australia

² New South Wales Branch, AusBiotech Australian Biotechnology Students Association

³ School of St Vincent's Haematology Research, Faculty of Medicine, University of New South Wales, Garvan Institute, 384 Victoria St. Darlinghurst, NSW, 2010, Australia

ABSTRACT

Currently, Australia is experiencing a downturn in students in science and technology. There are constant concerns that Australia is lacking in engineers and scientists. As part of a push to communicate biotechnology and biomedical engineering to students and the public in Australia, a special student interest group, the Australian Biotechnology Students Association (ABSA) was formed to help popularise biosciences to the youth demographic, and provide a catalyst for networking youth to industry. The role of youth demographic-specific tailoring of networking, information and careers development events, and its potential effect on the popularisation of science to the Australian community has been examined, with ABSA and its activities as a case study of a demographic-specific tool to create a strong community of educated students that will hopefully feed Australia's need for science and technology professionals.

INDEX TERMS

Biotechnology education, biomedical engineering education, science communication & popularisation, youth career development, networking.

INTRODUCTION

The objectives of ABSA are to provide a supportive network for students in biotechnology and biomedical engineering who are career-savvy and industry-savvy. In part, we hope that our work can turn around the trends of a lack of young scientists, engineers, and innovators in Australia.

The Problem

There is a low understanding of the science and technology industries in Australia. There has also been a lacking of a supportive network for biotechnology and biomedical engineering students.

The following topics we address that are relevant to the PCST 2005 theme include:

1. How to make effective communication of science and technology in targeting rural and urban communities? In what way the practitioner approached and engaged the community, and how well their science literacy improved.
2. How to make effective communication of science and technology in targeting youth sector? Young people nowadays are growing up with a tendency of refusing science. How could we make them like science and get them involved.

* Corresponding author email: henry.ko@student.unsw.edu.au

3. How to engage scientists and science community in communicating science and technology? The workable initiatives to stimulate their dynamics and the results.

The Situation We Are Trying To Address

How do we keep students interested in science and technology? How can we give a taste to secondary students of what university life is like and how exciting science and technology is? How can we create a supportive community for current biotechnology and biomedical engineering students? How can we foster a network of students with a common goal of being more aware of career choices and industry-savvy?

Identified Objectives & Reasons:

ABSA's objectives include:

1. Reaching out to youth in the general public to communicate science (specifically biotechnology and bioengineering) and to promote it as a career path, and
2. To support students in biotechnology and bioengineering with various activities and services to create a network of young members who are career-savvy, industry-savvy, informed and skilled. ABSA aims to make effective communication of science and technology (specifically for biotechnology and bioengineering) targeting the youth sector of Australia. Our initiatives are aimed at creating and fostering an involved, pro-active, and supportive network of young scientists.

In terms of communication of science, the reasons for our objectives are:

1. To educate the public about biotechnology and bioengineering
2. Make science interesting and an interesting career choice for students
3. Create and foster a network for university students with industry
4. Provide initiatives to help develop members' networking skills and opportunities to learn other skills

The guiding aims are to make the student experience much better, and to expose students to what's out there and to integrate into their education industry knowledge and networking skills.

THE SCIENCE COMMUNICATION PROCESS

ABSA has used the following strategies in achieving our aims of creating a supportive student network of young scientists and engineers with better industry knowledge and generic career skills.

1. Use of a student network to create and develop relevant initiatives to target the youth sector (both to the public and to the tertiary sector) to popularise and communicate biotechnology/bioengineering as a career, and to raise its profile to youth in Australia, or
2. Specific targeting of university students via biotechnology/bioengineering seminars and career-relevant activities to help develop a network of young professionals with a common interest in science (an Australian perspective), or
3. The organising and running of a "Biofutures" camp to educate the public about biotechnology and bioengineering and to raise its profile to youth, and to popularise it as a career choice.

Target Audience/Public/Community:

We have aimed to target our communication towards the public, especially the younger generation that are yet to decide on their future studies. Tertiary students are also our primary target audience. We are also targeting the biotechnology and bioengineering industry trying to promote the industry to the students and involve the industry in building and supporting the future of our industry in Australia.

Science & Technology Activities:

Throughout the year ABSA holds many events in order to advance the Science Communication process. Some of the events and communication mechanisms are Seminars, which has a specific topic and those who are experts in those fields are invited to talk to the students. Homebrew event is held twice a year and it is a relaxing event where students are given a chance to talk to specialised personnel in a relaxing environment, talking about subjects ranging from skills needed for networking to intellectual property. We also aim to send out bi-monthly emails and newsletter to our member base to let them know of the latest developments in the field of biotechnology and bioengineering. Currently we have an annual science camp, BioFutures, which is held in Brisbane, Queensland, however we are also holding an annual BioFutures camp in Sydney, New South Wales, this coming year as well. This camp is aimed at secondary school students who have a keen interest in biotechnology and bioengineering. At this camp they have the opportunity to meet scientists and engineers in a wide range of area in biotechnology and bioengineering, and take a close look into the future developments of these areas.

Throughout all of our activities we have been the organising and steering committees. We have worked together with AusBiotech, universities, the biotechnology and biomedical engineering industries, relevant government sectors and respected research institutes such as Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Garvan Institute of Medical Research. We have aimed to provide a networking group and a greater process of science communication for the ABSA members.

In summary, communication mechanisms include public outreach and communication activities and events such as:

- Seminars
- “Homebrew” events
- Newsletters/emails
- The “Biofutures” annual camp/forum for high school students

Involvement and relationships between those involved include:

- The ABSA organising/steering committee
- ABSA members
- AusBiotech
- University departments
- Industry organisations

The ABSA organising/steering committee liaises with each of the involved groups to coordinate events. The degree of interaction with each group is variable depending on the activity to be run.

EVALUATION

Results of ABSA’s initiatives have included the successful running of:

- Networking seminars;
- careers information seminars;
- industry involvement with the events, which raises the public profile of participating organisations;
- opportunities for students to meet and network with industry representatives;
- informing students of the opportunities within the Australian industry;
- being able to recruit pro-active students to the ABSA committee, and more students being informed about ABSA’s activities.
- Biofutures;
- University support for our events;

- Undergraduate Research Opportunity Program (UROP) – industry/student work experience (mainly for high performing 2nd year university students)
- AusBiotech support;
- Industry support and sponsorship for our events.
- “Student Excellence Awards” to let the industry know how good and innovative students in Australia are

Evaluation and assessment measures to gauge how well results were achieved include:

- Critical review meetings critiquing organisation process,
- student feedback (via written and oral feedback) after attending events,
- industry/organisation representative feedback (via written and oral feedback),
- committee evaluation of the success of sticking to timelines
- internal reviews and evaluations of performance and achievement of organisational roles and tasks
- Counting of student and public attendances of events
- Counting of students and the public who join ABSA

DISCUSSION

The situation in Australia is that science and technology is not as attractive a career option as other fields. This is partly the reason why we are seeing a downward trend in the recruitment and retention of students in these fields. Another reason is that the sciences and engineering disciplines can be seen as a rather static and purely individual and technical field.

ABSA is doing a small part to help create a community of young professionals who can think outside their taught university courses, and are knowledgeable in industry and career matters.

Our science communication processes have been aimed at not only being technical and generic skills focused, but also importantly focused on fostering a sense of community amongst students. ABSA’s activities have aimed to promote the dynamic nature of the biotechnology and biomedical engineering fields to students and the public.

In doing so we hope to foster the public perception that science and technology, like biotechnology and bioengineering, is an exciting field to be in in the 21st Century.

CONCLUSION

From the active science communication activities of ABSA that is aimed at supporting the youth demographic’s development in industry and career related issues, it is a step in the right direction to creating a future generation of intelligent multi-dimensional career-savvy and networked scientists and engineers. This is certainly a step in the right direction to reversing the often wrong public perception of an all too boring, static and impersonal field.

ACKNOWLEDGEMENTS

The work of ABSA NSW Branch would not be possible without the active dedication of a core committee of students. The ABSA NSW Branch committee members for 2004/2005 are Terri Lin, Johann Lenffer, Paulo Lai, Kritika Hariharan, Gorjana Kisa, Haomin Chen, Lydia Ng, Laura Middeldorp, Nicole Yu, Jennifer Li, Vivian Lo, Christine Remediakis, Jean Hsu, and Henry Ko.

Continual year-round support comes from AusBiotech NSW Branch and the New South Wales Government Department of State and Regional Development (NSW DSRD). We thank the sponsors and supporters of our various events we have held throughout the year. These include AusBiotech, Glaxo Smith-Kline, Pfizer, Science People, NSW DSRD, Garvan Institute of Medical Research, ResMed, Spruson & Ferguson, University of New South

Wales' Biomedical Engineering Student Society, Australian Society for Biomaterials, and many others.

We would also like to thank our ABSA colleagues in other states, especially the Queensland Branch of ABSA.

REFERENCES

1. A. Thomas, "Holistic approach needed to address skills shortage", Engineers Australia, 2005, April, pp72-73.
2. Various discussions with committee members of NSW Branch of AusBiotech, 2004-2005; state representatives of ABSA; committee members of NSW Branch of AusBiotech; Australian Biotechnology Students Association, 2004-2005; students who attended ABSA events, 2004-2005; sponsors and supporters of ABSA events; academics from University of Sydney and University of New South Wales.
3. "ENTREPRENEUR CALLS FOR "SCIENCE LITERACY" PUSH", Luna Media press release - Friday 29 April 2005, Karen Eck, publicist, Eckfactor, received on ASC-media mailing list, 29 April 2005.