Educational Benefits of Student Research Projects in The School Of Horticulture.

Gary Jones
School of Horticulture, Kwantlen University College, Langley, BC.

Introduction

Horticulture is an 'art of science'. As such, it attracts people from a very wide background of personalities and therefore learning styles. The current generation of learner is inquisitive, technically savvy, and while being a team player is also confident enough to tackle the unknown alone with some 'hand-holding'. How do we as instructors facilitate learning for these students?

In recent years, students in HORT 2372 'Greenhouse Vegetable Production', have been asked to undertake a research project. This has been:

- on a topic of the student's choice
- performed by an individual, or as a pair
- completed in one semester or linked in with another HORT course from a previous semester
- presented as a poster at a mini-conference

How's it done?

At the start of the semester, students are asked to decide on a topic that they will work on for the next 13 weeks. A time table is provided to keep students focused on task and provide regular 'checks' and incentives for progress.

Projects should as far as possible include some element of authentic research (not just providing a literature review) and involve the physical production of a crop, control of a pest, evolution of a new concept for greenhouse vegetable production. Materials and facilities are provided within the School of Horticulture, or supplied 'in-kind' by industry partners. This link to commercial companies or industry associations is vital to the success of some projects.

Students are introduced for the first time in many cases to the realities and vagaries of undertaking a scientific investigation. 'Murphy's Law' is often high on the learning curve.

Fig. 1. Students often investigate the effects of a new product on crop growth, such as these cucumbers and tomatoes being given a new liquid fertiliser.

Having completed the practical aspects of their project, students are provided with a PowerPoint template and present their results as a Poster at a 'Poster Conference' held for a half day in week 14 of the semester in a suitable location (e.g. a Board Room). Other Faculty, staff, students and other members of the Kwantlen community are invited to attend. A Poster Conference booklet is produced providing summaries of each poster. Students are required to assess the posters of three of their peers, and these assessments form part of the overall grade awarded to the student's projects.

What do students learn?

Students clearly become familiar with the subject of their particular project topic. In addition, students learn a number of important skills, irrespective of their individual project topic, for instance:

- Keep the topic simple – investigate a single question
- Research is often fraught with problems to be solved – critical thinking skills and problem solving skills are developed
- Asking questions is part of the process – not knowing the answer is not a bad thing, its OK!
- Even if the results are not what was expected, there are always successful lessons that can be learned
- Therefore, each student can achieve success through their project, even if they learn that they do not want to do research.

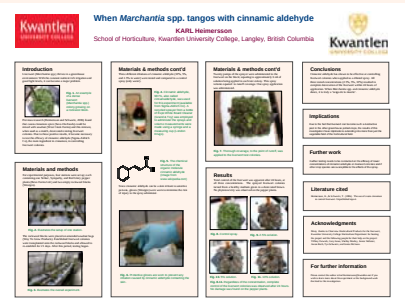
When *Marchantia* spp. tangos with cinnamic aldehyde
KARL Heimersson
School of Horticulture, Kwantlen University College, Langley, British Columbia
Introduction
Materials & methods cont'd
Materials & methods cont'd
Conclusions
Implications
Further work
Materials and methods
Results
Literature cited
Acknowledgments
For further information

Fig. 2. While students ultimately produce a scientific poster, the main objective of the exercise is the process of the investigation. The learning itself is the objective, but having a focus on a specific research issue deflects students' attention away from learning to simply having a fun learning experience.

Many of today's students look for instant results. To some extent they also have a degree of expectation that as long as they put the time in, they can expect an 'A-grade'. Yet, they can be equally critical of the work of others. By doing assessments of peer's posters, they learn that there is little reward for simply 'turning up'. They learn that peers expect a high standard of work and that effort is required. Also, in order to complete the task on time and to an acceptable standard, there is a significant amount of planning and organisation required – identifying a suitable thesis, deciding how to prove (or otherwise) this question, organising materials and supplies, identifying potential problems and ironing out those that were not thought about! Plus, there is a danger in leaving things to the last minute – like printing off the poster the night before the Poster Conference and finding the printer doesn't work.

What else happens?

There are a number of other important benefits.

- Students become 'experts' in their chosen subject area
- This makes them feel good, and they gain in confidence
- They rapidly gain respect for industry researchers and the 'trials of trials'
- Students bond together through the challenges of working through problems and 'talking things over'

Fig. 3. The Poster Conference provides a focus for students, Faculty, staff and others to exchange ideas, develop thoughts and celebrate success.

Other than benefits to the students, there are also important benefits to the wider community, such as

- Involvement of Faculty and Staff
- Involvement of wider community partners
- Assimilation of ideas from a wider scope of courses in the program
- Development of ideas for future projects
- Faculty learn that its OK not to know all the answers and its fine to be facilitators of learning rather than founts of all knowledge
- Faculty and staff obtain access to 'Professional Development' and keeping up to date with new ideas within the horticultural industry

Fig. 4. Summaries of each student project are collated and presented in booklet format. Students value the overview of all the work so presented, and often keep these Conference booklets as a memory or journal of their time in HORT 2372.

So what?

One of the burning issues for all teachers is how to 'get through'. How to make that connection with students and their learning. Plus, in a large institution, there is always a question of how Faculty can help make a connection between courses, ideas and concepts across a program – joining up the dots to avoid 'in-the-box' course thinking. I believe that such research projects given a public setting such as the Poster Conference, can help students identify issues, instill motivation and provide a forum for success. In addition, it provides a natural setting for Faculty to reach out to each other and support colleague's teaching.

Over to you

What's next? Have a go! Identify some possible areas for your students to work on and encourage them to develop their own projects. You will have lots of work to do, but you will equally be rewarded watching people learn through their own efforts.

Useful stuff

Heimersson, Karl. (2007) "When *Marchantia spp*. tangos with cinnamic aldehyde." School of Horticulture, Kwantlen University College, Langley, BC.

MacIntyre, Alia. (2006) "Comparison of organic liquid fertilisers in hydroponic production." School of Horticulture, Kwantlen University College, Langley, BC.

Purrington, Colin. (2006) "PowerPoint Template for Scientific Posters." Department of Biology, Swarthmore College, Swarthmore, Pennsylvania. cpurrin1@swarthmore.edu

Thanks to…

Thank you to all those students how have so enthusiastically undertaken their research projects in HORT 2372. Their enquiring minds and challenging questions have enlightened all of us and re-enforced all of our life-long learning. Thanks.

Thanks too to colleagues at Kwantlen who in turn have supported all these students in undertaking these projects.

Got Questions?

Contact Gary Jones at 604 599 3311or Gary_Jones@Kwantlen.ca for further information.