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Community Based Learning with Second Year Chemistry Undergraduates - Piloting a Junior Scientist Badge with a Local Youth Service

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Students Learning with Communities

What did we do?

We developed a pilot syllabus for a Junior Scientist badge for 8 to 12 year olds. It involved interaction between 16 of our students & 9 young people from St Michael's Youth Project in Inchicore over 5 weeks. The inspiration came from work in the USA to promote science to girls by supporting scouts towards obtaining a chemistry badge.[1] This is one of a series of community based learning (CBL) projects implemented as the 'lab' component of a 2nd year Professional Skills module for chemistry at Dublin Institute of Technology (DIT).[2]

What is community based learning (CBL) and why use it?

CBL involves learners in a real world project in partnership with a community group. A genuine community need should be addressed.

Students gain academic credit for learning outcomes achieved, including reflection on their experiences.[3] The aim is that the community partner and students should both benefit (see Figure 1).

Participation in CBL has been previously shown to assist development of our students' problem-solving, teamwork, organisation, digital literacy and scientific communication skills.[4]

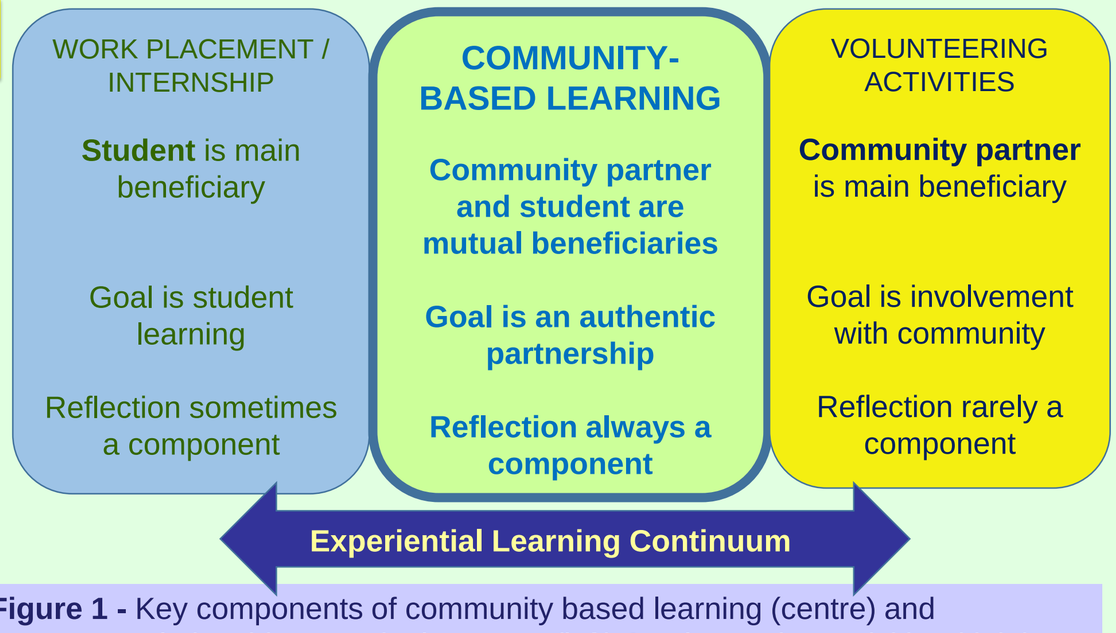

Figure 1 - Key components of community based learning (centre) and relationship to work placement (left) & volunteering activities (right)

Aim for DIT chemistry students

To prepare for and implement hands-on science activities with young people from under-represented socioeconomic groups who have an interest in science.

Anticipated aims for the young people participating

To have an opportunity to learn more about science & build on an initial curiosity.

To begin to see higher education as an achievable goal through their interaction with DIT chemistry undergraduates (some of whom have similar backgrounds) and by becoming familiar with a third level campus.

How was the Junior Scientist Badge implemented?

Week 1 & Week 2*	Week 3	Week 4	Week 5
Planning. DIT students assigned to groups of 4. They trialled activities and prepared lesson plans & risk assessments. *All DIT students had obtained Garda clearance to work with young people in advance.	**First session in youth project**. Part 1 of Royal Society of Chemistry (RSC) Global Experiment[5] on Vitamin C; calibration & initial testing of cooked & uncooked fruit.	**Second session in youth project**. Part 2 of RSC Global Experiment[5] on Vitamin C; comparison of different fruits & vegetables, effect of aging & country of origin. Results uploaded to RSC website.	**"Science circuit" hosted in DIT.** 7 stations (10 minutes each) on key aspects of primary science curriculum with worksheet to be completed. Afterwards, junior scientist certificates, mugs and badges were presented.

ROYAL SOCIETY OF CHEMISTRY

How did we assess our chemistry students?

Assessment component	Weighting
Participation in preparatory sessions and use of discussion board (weekly group reports posted)	25%
Lesson plans and handouts prepared, interactive sessions and feedback from staff in St Michael's Youth Project	30%
Individual reflective piece -describing the team effort, each individual's contribution & reflecting on project & skills developed (prompts provided)	20%
Individual blog -recording work during & outside lab sessions. Practice runs of hands-on activities written up in lab report format.	25%

How was the Junior Scientist Badge project evaluated?

1. We reviewed the reflective pieces submitted by our students. To promote honest feedback, guidelines stated there was no one correct opinion & asked for suggestions on improving the project.

- Our students found the activity challenging initially, particularly organisational issues for group work. On completion, they reported that they found the real-world context interesting & the project contributed to their personal & professional development.

2. The youth group co-ordinator completed an evaluation form;

'The programme was well designed and interesting. The students interacted very well on the young people's level, engaging them in the activities and keeping them interested.'

What's next?

To ensure this is more than a once-off interaction, participants will be encouraged to mentor others in following years and to exhibit a project in the annual DIT Scifest. There is potential for application with guide / scout units as well as other community youth groups.

References

1. Outreach activities at Kalamazoo College, Regina Stevens-Truss; https://reason.kzoo.edu/chem/faculty/regina/op/ (see final entry).
2. 'Chemical Sciences in the Community' poster, Students Learning with Communities, DIT; https://www.dit.ie/media/ace/slwc/Claire%20McDonnell%20&%20V%20Murphy%20chemistry%20CBL%202015.pdf
3. L. McIlrath & C. McDonnell (2014) Community Based Learning – An Introductory Guide For Higher Education Staff; http://www.campusengage.ie/userfiles/files/Community-Based%20Learning%20WEB.pdf
4. C. McDonnell, P. Ennis, L. Shoemaker (2011) "Now for the science bit: implementing community-based learning in chemistry", Education + Training, 53(2/3), 218-36; http://arrow.dit.ie/scschcpsart/28/
5. RSC Global Experiment 2013; http://www.rsc.org/learn-chemistry/collections/experimentation/collaborative-chemistry/chemistry-week-2013

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