

1. 'The Plymouth Student Scientist': an undergraduate e-journal

2. Contact details

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3. Context

- Institution / Department: **University of Plymouth, Faculty of Science**
- Title of initiative: **The Plymouth Student Scientist**
- Level: **The focus is on publishing Final Year honours projects, literature reviews and 'special interest' articles. The e-journal's main target audience is science undergraduates across all levels.**

4. Brief Description

The Plymouth Student Scientist seeks to make the research process more accessible/explicit, by publishing science honours projects that have been assessed as excellent. It also aims to support staff and student involvement, by acting as a teaching tool for staff and as a vehicle to promote, share and celebrate student research activities. The intention is for the journal to encourage students to become more reflective and critical of their own research skills as they consider their peers' work. This has proved to be a transferable initiative due to the successful launch of two other similar e-journals in the Faculties of Education and Health & Social Work at Plymouth in spring 2009.

5. Issues of Department / Institution Organisation

A strong research ethos is embedded in the Faculty of Science's undergraduate programmes from the start of our students' careers at the University of Plymouth. However, students often become very assessment driven and goal orientated, so it may not always be evident to them that they are engaged in 'research' activities. The online journal is the main output of a HEFCE-funded project, to support and develop research informed teaching at the University in the Faculty of Science.

Undergraduate research journals are an important feature of many undergraduate research programmes, particularly in North America and increasingly so in the UK (Tatalovic, 2008). The value of new technologies and e-journals to raise the profile of student research and effectively link teaching with research has been highlighted by Jenkins, Healey & Zetter (2007), with the typical emphasis on dissemination and celebration of student work rather than directly supporting teaching activities. It is therefore not surprising to note that there has been a recent surge in the appearance of new institutional e-journals in the UK, several of these with a science focus (see Walkington & Jenkins, 2008 for a recent list). Our e-journal seeks to make the research process more accessible and explicit, by highlighting examples of good practice from across the Faculty of Science. It also aims to support both staff and student involvement, by acting as a teaching tool for staff and as a vehicle to promote and share student research activities. It is hoped that the journal will encourage students to become more reflective and critical of their own research skills as they consider the work of their peers. It is with this aim in mind that all articles are presented, largely, in their original state often with imperfections but still worthy of a first class mark. In addition, we hope the journal will enable students to see a range of research activities and potential collaborations with staff at the University, encouraging further dialogue and enquiries.

The Plymouth Student Scientist is supported by the University's Teaching Quality Enhancement Fund (TQEF) research-informed teaching initiative and is being led by Dr Karen Gresty (School of Biological Sciences), in conjunction with staff from the two other Schools in the Faculty. A total of £55,000 was received to carry out this action research project, the majority of this funding being devoted to the funding of a 0.6 FTE research assistant (RA) for two years. Andrew Edwards was appointed as RA in October 2007 and has been responsible for the day-to-day development and support of the e-journal using the free Open Journal Systems software (<http://pkp.sfu.ca/?q=ojs>). We commissioned external IT support and hosting from a local company (ICO³, who have been used before to successfully host educational resources) and this has allowed academic staff to focus on the content and developing the strategy of embedding and disseminating the e-journal to its target audience.

This initiative stands alone outside our science curricula; however it is closely aligned to the third year dissertation or honours project module in each School. The initiative involves very little extra work for

academic staff or students, which we believe is vital to its take-up with stakeholders as we are not increasing people's workload. Academics are expected to ask potential final year science students if they had thought about publishing their research project in the journal and they also need to provide a signed consent form, to show a discussion with the student has taken place. Students need to provide an electronic copy of their work and also a signed consent form. We expect no more effort on their behalf than that, other than a voluntary response to take part in our evaluation.

References:

Jenkins, A., Healey, M. & Zetter, R. (2007) Linking teaching and research in disciplines and departments. The Higher Education Academy [ISBN 978-1-905788-38-5](#)

Tatalovic, M (2008) Student science publishing: an exploratory study of undergraduate science research journals and popular science magazines in the US and Europe, [Journal of Science Communication](#) 7(3).

Walkington, H. & Jenkins, A. (2008) Embedding Undergraduate Research Publication in the Student Learning Experience: Ten suggested strategies. [Brookes e-journal of learning and teaching](#), 2(3).

6. Issues of Student Selection and Support

The first thing we did was to identify our project aims for the e-journal and these were:

- To encourage and facilitate academic staff to develop a more explicit approach to supporting the research process.
- To promote the active engagement of our students in the research process from Level 1 up through to Level 3.
- To provide an opportunity for staff and students to reflect and share their ideas regarding what 'doing research' means.
- To disseminate the results of staff and student research projects.

However, when we started to focus on what we were going to do in more detail, it became clear that the last aim involving honours projects was going to be the simplest one to achieve in the short term. Consequently, our efforts have been targeted on achieving this but with the intention that the other aims will still be addressed over a longer timescale.

After informal discussions with staff across the Faculty, we produced two sets of frequently asked questions (FAQ) and general information sheets; one targeted at staff and one targeted at students (see separate attachments for more information). The main purpose of the information sheets was to a) raise the profile of the e-journal internally; b) to try encourage discussion about the project; and c) to recruit copy for the first issue. The information sheets were sent out by e-mail distribution lists to staff in the first instance and later students (once staff were aware what the initiative involved). We also produced a poster to promote the development of the e-journal and gave a presentation at our University's annual pedagogic conference to raise awareness amongst staff in the first instance.

The first issue of the journal featured honours projects from the previous cohort of students who we were able to contact and get informed consent from (see separate copyright and consent form). It featured a selection of projects and literature reviews that had been moderated as 'excellent' and one peer-reviewed conference poster, which was collaboration between two undergraduates and a bioscience member of staff. The second issue featured work from students who were just about to graduate (in 2008), who had been encouraged to contribute their work by their project advisors or who had decided to contact the journal independently. The third issue has recently been published, also featuring work from students who graduated in summer 2008.

There is a section in the journal for student research support, in the form of a one-stop shop of hyperlinks e.g. how to reference, relevant Bioscience Internet sites etc., and we hope that staff will continue to supply new links for this section as they find them. The 'letters' or discussion forum has not happened yet, as there has not been any demand from staff or students for this facility. However, this is an iterative process and we have been able to incorporate some ideas from respondents into the latest issue (such as extra information on the articles and how to cite them). We are currently

analysing the results from staff interviews and a student survey to see if there is any other demand for additional sections in the e-journal.

We had an original aim of involving students in the evaluation of the articles (second bullet point above) by removing sections from the project involving 'future work' and 'limitations of study'. The intention was for tutors to use these pieces of work in first year tutorials, to get students to think critically about work and how it could be improved or extended. However, this has only been adopted by some Psychology tutors and until we have completed our evaluation, we do not know if it is likely to be supported by more staff.

To date, only final year honours projects and literature reviews that have been moderated as first class are considered for publication. There is also a 'special interest' section of the e-journal which publishes work which may result from a staff/student collaboration e.g. conference posters. The first issue (Jan. 2008) of the e-journal featured seven honours projects, four literature reviews and a poster, involving work from 10 students in total. The second issue (Autumn 2008) featured six honours projects, four literature reviews and a poster: a total of 11 students' work. The third issue featured eight honours projects, four literature reviews and one special interest article written by a student research assistant in collaboration with a Psychology member of staff: a total of 13 students' work. Articles are selected for publication by the project management team after students have discussed and agreed submission with their project advisor, providing a signed consent form. The project management team involves staff from the three Schools in the Faculty of Science and we try to strike a balance so that as many subject areas as possible are represented, to appeal to the widest student audience. We have not needed to reject any student work to date and as work is published 'warts and all' (apart from the correction of a few typos and conversion of their work to a PDF) support has largely come from the project's part-time research assistant, as well as the project team members in each School.

7. Issues of Student Reward

There is no financial or credit reward for being involved in this initiative, apart from the students seeing their own work published and disseminated. However, incentives were provided as part of the original student evaluation of our project, to encourage student returns of our online questionnaire (we provided 20 prizes of a bottle of bubbly or £5 M&S vouchers).

8. Does it work? *(Student, employer, peer review response. What does evaluation and /or research reveal as to its impact?)*

Students who have published in the e-journal have been interviewed and their comments are currently being transcribed for evaluation purposes by thematic analysis. When asked what benefit they could perceive in having their work published in the e-journal, they highlighted:

"I couldn't think of any one reason, for me it is the celebration of work and knowing that what you have done has been relevant and made a difference".

"To benefit society with what we have found out"

"To make a difference"

These students were also asked what relevance the journal was to their work and commented:

"It may help me when I'm creating my own research projects by (my) being able to see how others have carried research out."

"I think the contents of this journal will prove to be very useful for future undergraduates. I know I would have used it during the course of my degree."

"I have a great interest in new developments gained through research and would like to be more closely involved with research at Plymouth. Therefore I can see the journal being a useful portal to achieve this."

An online questionnaire was carried out with the current undergraduate students in the Faculty and again, the results are currently being processed. The response rate was not high (but is in line with other online surveys) and we have data from 160 students which is being analysed. In the first two months after publishing our first issue, we had 22,892 hits and 2,008 individual visits. In addition, 687 people read the full-text PDF articles in the same period. At the end of its first year of publication, the e-journal had registered over 2 million hits from internal and external users.

Evaluation from an academic perspective has taken place by staff interviews and questionnaires and is currently being transcribed. It is too early to comment on emerging themes from these transcripts but from a personal perspective, my final year students are using the journal to explore what a 'first class' literature review looks like in their subject field (achieved by students only one year above them) and also how to structure an honours project regarding content, data presentation, analysis and discussion. The facility to do this online has been greatly appreciated by my students and it has alleviated many of their worries, now they have access to what constitutes as 'excellent' student work.

The e-journal was commended by a visiting external accrediting body (the British Psychological Society) during a validation visit in 2008. The School of Psychology was commended on how it supports research skills for its students, and the Plymouth Student Scientist was part of the package that drew praise. Other positive comments include:

"It looks tremendous, many congratulations" (Dr Mick Uttley, Associate Dean of Science, University of Plymouth)

"I have looked at the journal and love the layout and accessibility – well done to you all" (Sue Burkill, Head of Education Enhancement, University of Exeter).

"Although not a scientist and therefore not qualified to comment on the content of your articles, I am very impressed overall with your journal" (Dr Carol Banks, Editor of 'Diffusion', UCLan's undergraduate e-journal).

Prof. Alan Jenkins (Oxford Brookes University) stated in his editorial for the second issue of the journal:

"Of the UK based journals I think there is much to praise about The Plymouth Student Scientist. ... I think this journal has set a bar for other institutions to reach. But I think the task now is to see how to mainstream this approach for all students at Plymouth and other higher education institutions; while also ensuring high level undergraduate research journals for selected students. You have helped show the way forward".

9. Key advice

1. Ensure that you have adequate funding to employ a part-time research assistant to provide project support to staff (and students) on a weekly basis.
 2. Employ a good hosting company to provide a site and hosting/support facility for the Open Journal Software.
 3. Assemble a motivated project team of enthusiastic staff who are aware of their individual roles and responsibilities.
 4. Do not underestimate the internal publicity and promotion that you need to do to make people (staff and students) aware of your activity and to get them 'on board'. This needs to be done more than once on a 'drip-drip' basis!
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10. What leadership issues have arisen?

A small number of science staff were relatively unsupportive of this research-informed teaching initiative for several reasons, including the belief that first class student work should be published in the established international literature, rather than in a 'home grown' journal. However, the e-journal does not seek to preclude this activity: it offers an alternative publishing medium for those pieces of student work that might not be accepted in other journals (e.g. due to sample size restrictions or work forming a small element of a wider project). We can also provide hyperlinks to our student work (abstracts) that have been published elsewhere, helping to promote and celebrate this success. Staff antipathy has not proved to be a major stumbling block and we did not expect to persuade everybody to come 'on board'. The majority of staff have been supportive, however, allowing student work to be collated and published. The presence of a research assistant to take the pressure off staff workloads has been invaluable and once tutors learn that their involvement is not time-consuming or burdensome, they have typically been more willing to support the e-journal and advise their students to submit work.

The sustainability of the e-journal is something that is becoming critical, as our money will run out next Easter 2010. In terms of academic staff time, it is not an onerous task to co-ordinate recruitment of copy for the e-journal. However, this initiative really does need the valuable support of a research or editorial assistant who can collate, proof-read the articles, process them for publication and actually upload the material and 'publish' each issue. Without this level of support and ability to manage the Open Journals Software (which is not a full-time task), it would not be possible to continue with this initiative in the medium or long-term. Journals typically employ a range of technical and support staff to help with the publication process but academics give their time freely in an editorial capacity; this is the situation we also find ourselves in with our e-journal. We are currently exploring options using our evaluation evidence to make convincing arguments for continued investment by the Science Faculty or University generally, regarding an enhanced student experience.

Despite some initial difficulties trying to replicate this project (regarding project team membership and recruiting copy from students), we have expanded and have already launched two other e-journals at the University (*The Plymouth Student Educator* and *The Plymouth Student Journal of Health & Social Work*). We have just received additional funding to spread good practice amongst academic staff (including partner colleges), to widen the opportunity of publication in the journals to new students and programmes and to promote embedding of this initiative in a range of curricula.

I view this initiative as a way of developing a sound pedagogic resource that can be used by staff which will also support our students' research experience: so it is both a research and teaching tool.

11. Relevant references and Web sites

The Plymouth Student Scientist e-journal can be accessed via:

<http://www.theplymouthstudentscientist.org.uk/index.php/pss>

The Plymouth Student Journal of Health & Social Work:

<http://www.theplymouthstudenths.org.uk/index.php/hsw>

The Plymouth Student Educator:

<http://www.theplymouthstudenteducator.org.uk/index.php/educator>

Please attach as separate files any details that you think would help others considering adopting this scheme / approach.

Files attached:

1. Information for students about The Plymouth Student Scientist
2. Information for staff about The Plymouth Student Scientist
3. Copyright and consent form