InfoPALS: Informatics Peer Assisted Learning Scheme

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Summary
This document proposes the establishment of InfoPALS, a Peer Assisted Learning Scheme for the School of Informatics. In the first instance, the scheme would be targeted at providing peer mentoring for teams engaged in non-assessed projects as part of the Informatics 1 OOP Course.

In addition to feedback from colleagues, this document has been informed by input from Neil Speirs (Widening Participation Project Officer and lead contact point for PALSs involved in Edinburgh Award), Lindsay Jack (Director of the Student Experience, Edinburgh Law School) and Katie Scott (Peer Support Development Officer, EUSA).

1 Motivation

The School of Law’s Peer Assisted Learning Scheme1 (PALS) initiative was started in 2006, and provides incoming first year students with weekly sessions of guidance and advice from current third or fourth year students.2 The scheme has proved extremely successful, and variants have been adopted by a number of other schools (e.g., BioPALS, PhysicsPALS, PsychPALS). The general framework of PALS is sufficiently well established that it provides one of the most straightforward routes to achieving eligibility for the Edinburgh Award.3 This in turn is recognised as contributing to a student’s Higher Education Achievement Report

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2 See also http://prezi.com/xl_heglotscn/law-peer-assisted-learning-scheme-lawpals/
3 http://www.employability.ed.ac.uk/Student/EdinburghAward/
More generally, the Edinburgh Award forms part of the University’s strategy for encouraging students to develop employability.\(^5\)

Although the potential applicability of Peer Assisted Learning to Informatics is broad, the current proposal is initially targeted on a particular activity, whereby third and fourth year students would mentor small teams of first year students working on a semester-long (S2) project within the context of Inf1-OP.

The proposed InfoPALS initiative would serve two primary functions:

- provide a more supportive and effective induction for novice programmers in the School; and
- extend the School’s existing co-curricular activities for enhancing graduate attributes and employability.

2 Informatics Mentoring

One of the innovations adopted for Inf1-OP in AY 2011/12 was the establishment of formatively-assessed, semester-long team projects,\(^6\) and these will be organised again for 2012/13. As before, tutorial groups of around 12 students will be further subdivided into teams of about four. Tutors will take overall responsibility for all the teams in their tutorial groups. The experience of last year suggests that while many teams were fairly self-sufficient, others needed a level of support that exceeded what tutors were able to provide in the time available. The current proposal is to use peer mentoring as a further source of support for such groups.

Finding a workable division of labour between tutors and peer mentors\(^7\) is both important and challenging. One key feature of peer mentors is that, unlike tutors, they are expected to undertake a facilitating rather than a teaching role. This principle suggests that peer mentors should focus on stimulating discussion within teams that helps them to clarify relevant issues and to find solutions for themselves.

Following the model adopted by LawPALS, I suggest that peer mentors should work in pairs, and each pair should meet with their allocated group on a weekly basis, focussing on a pre-determined topic. However, a specific feature of InfoPALS would be that each mentor is assigned to exactly one project team; consequently, we would expect that in general, a pair of mentors would meet together with just two teams at each weekly session. A candidate list of topics is given in Table 1.

**Project Presentations** Independently of the mentoring scheme, there are two points at which project teams would present their work to others. First, in Innovative Learning Week, each team might give a short overview of their work, with a demo if appropriate, to other students in Inf1 (and possibly to older students).\(^8\) Second, there would be an end-of-semester presentation / prize-giving session where each team would be expected to demo their project. According to this proposal, both of these presentations would be

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\(^4\)http://www.ed.ac.uk/schools-departments/registry/other-info/hear  
\(^5\)http://www.employability.ed.ac.uk  
\(^6\)For more details, see Appendix A.  
\(^7\)Within the PALS framework, peer mentors are often call student leaders.  
\(^8\)Of course, this depends on whether presentations can be accommodated within the schedule for ILW.
Week 1: Project planning, setting milestones, division of labour, coordination mechanisms, rights & obligations of team members.
Week 2: Code sharing techniques, version control, code reviews.
Week 3: Writing and running tests.
Week 4: Using an IDE, debugging.
Week 5: OO design.
Week 6: ILW: project review and presentation.
Week 7: OO design continued, modularity.
Week 8: Refactoring, regression testing.
Week 9: User interfaces.
Week 10: Final review and presentation.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Project planning, setting milestones, division of labour, coordination mechanisms, rights &amp; obligations of team members.</td>
</tr>
<tr>
<td>2</td>
<td>Code sharing techniques, version control, code reviews.</td>
</tr>
<tr>
<td>3</td>
<td>Writing and running tests.</td>
</tr>
<tr>
<td>4</td>
<td>Using an IDE, debugging.</td>
</tr>
<tr>
<td>5</td>
<td>OO design.</td>
</tr>
<tr>
<td>6</td>
<td>ILW: project review and presentation.</td>
</tr>
<tr>
<td>7</td>
<td>OO design continued, modularity.</td>
</tr>
<tr>
<td>8</td>
<td>Refactoring, regression testing.</td>
</tr>
<tr>
<td>9</td>
<td>User interfaces.</td>
</tr>
<tr>
<td>10</td>
<td>Final review and presentation.</td>
</tr>
</tbody>
</table>

Table 1: Weekly Discussion Topics

preceded by a meeting with the peer mentors which would provide an opportunity to review and reflect on the team’s work to date. Mentors would also be expected to attend the team presentations.\(^9\)

**InfoPALS Coordinator**

Following the model of LawPALS, we would hope to be able to appoint a PhD student as InfoPALS coordinator. The coordinator would liaise with the peer mentors on a regular basis, help organise and schedule relevant events, and manage three reporting / discussion sessions for the mentors in the course of the semester.

**Selecting Mentors**

Ideally, we would handle calls for mentors using the same advertising and tracking mechanisms used by the ITO for managing HTN posts such as demonstrators and tutors. Candidates would be required to submit a CV together with a brief statement covering why they are interested in mentoring, what relevant technical skills they possess, and why they believe they are well suited for the task.

### 2.1 Graduate Attributes and Employability

Following the general outline proposed in the University’s [*Graduate Attributes and Indicative Interpretation*](http://www.employability.ed.ac.uk/documents/GAFramework+Interpretation.pdf),\(^{10}\) we envisage that InfoPALS would provide peer mentors with the following opportunities to enhance their graduate skills:

**Research and Enquiry:** Reflect on Informatics-relevant skills and experience that have been acquired as much by practice as formal tuition, including techniques for effective software development and working within a collaborative context. Gain greater awareness of differences in the ways students learn, especially as it affects software development.

**Personal and Intellectual Autonomy:** Take the initiative in understanding and anticipating the particular interpersonal and technical needs of the project team. Take the initiative in determining the detailed content of each weekly session within the broad parameters of the overall InfoPALS programme.

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9. In 2011/12, CompSoc played a central role in helping organise the end-of-semester project demo session.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-course training</td>
<td>7</td>
</tr>
<tr>
<td>Edinburgh Award seminars</td>
<td>6</td>
</tr>
<tr>
<td>PALS sessions (1hr x 10 wks)</td>
<td>10</td>
</tr>
<tr>
<td>PALS session preparation</td>
<td>10</td>
</tr>
<tr>
<td>Fortnightly InfoPALS reporting (Wks 3, 5, 7)</td>
<td>3</td>
</tr>
<tr>
<td>ILW project presentations</td>
<td>3</td>
</tr>
<tr>
<td>Final project presentations</td>
<td>3</td>
</tr>
<tr>
<td>Reflection on personal practice</td>
<td>7.5</td>
</tr>
<tr>
<td>Edinburgh Award final submission</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>50.5</td>
</tr>
</tbody>
</table>

Table 2: Provisional Time Allocation

**Communication:** Learn to appreciate the mental models of novice programmers, and to calibrate the amount and nature of information being communication accordingly.

**Personal Effectiveness:** Learn to respond to the changing needs of the project team, assess the strengths and weakness of the team members, be sensitive to group dynamics and adjust their interaction and facilitation methods accordingly.

### 2.2 Time Commitment

The framework of the Edinburgh Award has been developed in some detail, and InfoPALS is intended to fit into this framework. The main activities which would be anticipated (in addition to the ten weekly mentoring meetings) are the following:

1. Initial training for mentors, probably broken down into two blocks. This would involve one component provided by a representative of the Edinburgh Award (Neil Speirs), giving a general background and orientation to the Award and PALS; and a subject-specific component targeted specifically at InfoPALS.

2. Three one-hour seminars organised by the Edinburgh Award, scheduled for the start, middle and end of InfoPALS, which would encourage mentors to reflect on their personal skills and graduate attributes as they progress through the scheme.

3. Three one-hour reporting sessions in which the mentors would come together in a group to discuss Informatics-specific issues with the InfoPALS-coordinator.

4. Production of an 800-word reflective essay, to be submitted at the end of the semester to the Edinburgh Award coordinator.

Table 2 shows the approximate number of hours allocated to the various activities.
2.3 Draft Training Programme

Initial training sessions for peer mentors play a crucial role in the success of existing PALSs in the University. As mentioned earlier, part of this training would be generic, and part would focus specifically on issues specific to the proposed mentoring work. The details still require further work, but Table 3 gives a high-level breakdown of the main topics that would be covered.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro to Edinburgh Award &amp; PALS</td>
<td>2</td>
</tr>
<tr>
<td>Overview of Inf-OP course and project work</td>
<td>1</td>
</tr>
<tr>
<td>Review of main mentoring topics</td>
<td>2</td>
</tr>
<tr>
<td>Facilitating project teams</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 3: Pre-course Training Programme

3 Discussion and Conclusion

The current proposal should be viewed as a pilot. As such, it should give us a good basis for assessing the potential of InfoPALS, with a view to developing the scheme further by increased participation across the year boundaries, and widening the scope of topics considered.

A number of questions have been raised about an earlier version of this proposal, and these are addressed below.

1. Isn’t there a danger that this approach will get confused with demonstrating and tutoring posts? Shouldn’t we make it all more informal?
   A: On the contrary, it is easier to differentiate InfoPALS from existing student jobs by placing it firmly within the existing University framework for PALSs. This in turn involves some formal structure, distinctive to the Edinburgh Award, that promotes reflective thinking and ties into the University’s Employability initiative.

2. Why would students want to become peer mentors, especially if they don’t get paid?
   A: The experience of other PALSs in the University suggests that there is often strong competition for peer mentoring positions, and that students place a high value on both the development opportunity and the enhanced employability that come with the Edinburgh Award.

3. Why don’t we just leave this kind of thing to more spontaneous, student-led initiatives such as Cascaders, Hoppers and CompSoc?
   A: Cascaders has only operated intermittently over recent years, which suggests that a more sys-
tematic and sustained staff-based organisation is important. Hoppers and CompSoc both perform very valuable functions, but are sometimes perceived as ‘exclusive’ by students who don’t already feel connected to the relevant social groups. However, any mechanisms for encouraging synergies between InfoPALS and Hoppers, CompSoc and InfBASE would be worth considering.

4. Why isn’t the existing Informatics demonstrating (or tutoring) work recognised on students’ Higher Education Achievement Report (HEAR)?

A: In principle, we could seek HEAR recognition for demonstrating. However, seeking eligibility is likely to involve a fair amount of extra work on our part. The advantage of a PALS is that such schemes are already recognised as meeting the general criteria.

5. Why is this timetabled for Semester 2? It would work better in Semester 1, since this the time when new first year students are most likely to benefit from peer support, and also when there is less pressure on third and fourth year students.

A: There are certainly good arguments for running InfoPALS in Semester 1, either instead of, or as well as the scheme proposed here. This should be investigated further after the pilot has been carried out.

6. How could we expand the proposed scheme to something that would work more broadly? For example, it would be great if students in third and fourth years could also receive peer support.

A: We are somewhat limited in our options if we want to stay within the existing PALS/ Edinburgh Award system, since this requires approximately 50 hours involvement in a single year for eligibility. The first step would probably be to get a clearer idea of the learning needs of students which are currently not well met by existing provision. However, more generally one option would be to ‘cascade’ the student leaders upwards, so that, for example, student leaders in second year would graduate in third year to becoming leaders of the next second year cohort.

7. Could InfoPALS embrace other ongoing co-curricular activities in Informatics, such as Student Ambassadors\textsuperscript{11} for applicants to Informatics?

A: Work is currently underway to review whether a variety of current co-curricular activities could be integrated under the InfoPALS umbrella.

Conclusion

To summarise, the main advantages of the proposed Informatics Peer Assisted Learning Scheme focusing on Informatics 1 programming activities are:

• improving student programming skills via peer mentoring;

\textsuperscript{11}\url{https://www.wiki.ed.ac.uk/display/InfStAmbassadors/Informatics+Student+Ambassadors}
• improving networking and informal interaction between the different Informatics year groups; and
• providing a mechanism for formally recognising non-curricular achievements of third and fourth year students.
Appendix

A OOP Projects 2011/12

In the 2011/12 instance of Inf1-OP, tutorial groups that worked on weekly exercises were replaced by team-based development of a small project\footnote{https://infandango.inf.ed.ac.uk/static/tutorials/} that students carried out over the course of the semester. Students were expected to take on a fair amount of responsibility for managing their work together. The stated role of the tutors was to help guide the project, to give students feedback on their code, and to help ensure that all team members were able to contribute to the project.

There were a number of motivations for introducing a semester-long project. Unlike a weekly lab exercise, this would give students an opportunity to work on, refactor and extend a more substantial piece of code over a period of weeks, as well as providing them with more realistic scenarios for adopting an OO design. Second, it would give them experience of coding as part of a team, and hopefully some of them would gain a better appreciation of the value of well-defined APIs.

Because of the financial stringencies in 2011/12, I was only allowed resources to fund the tutors meeting with their groups on alternate weeks. Although there was some plausibility to the idea that students could use the week intervening between meetings to work on targets set during the meeting, in practice most tutors felt that it was necessary to meet weekly, and we managed to make some adjustments mid-semester to accommodate this.

A large number of the groups thrived, and produced excellent results (cf. \url{https://sites.google.com/site/2012oop/winners}). Note that the projects were not formally assessed, though prizes were awarded in a number of categories.

Nevertheless, a minority of cases encountered problems like these:

1. the two or three less experienced members of the group were relegated to mainly non-coding tasks involving graphical presentation; or

2. the team mostly consisted of less experienced members who floundered in dealing with a loosely-specified task and became demoralised.

Although I did my best to ensure that all \textit{tutorial groups} had roughly the same proportion of experienced members, the manner in which tutorial groups split into \textit{teams} (this was carried out during the initial meeting of groups) was not carefully controlled, and this led to a high degree of heterogeneity in team composition. I would propose that team composition for 2012/13 should be more tightly controlled by the course organiser.