Enhancing Research: A Strategic Approach

LANCASTER UNIVERSITY

Managing Research?

Higher Education does not like to be managed. It does not like to be watched. In fact, what academics really want is to be left alone.

With demands for an ever 'lighter touch' from the sector and demands for greater return on the investment of public funds, a new approach to university management is needed. Improvement in efficiency and quality lead by the sector, and funded by the public purse would allow many stakeholder needs to be satisfied. Focusing on ICT research, an area that is heavily funded and highly linked to industry, we propose a radical new approach to support university departments in maximizing both quality and efficiency in a manner that would be acceptable to researchers.

To meet the public demand for greater accountability, greater efficiency, and world class research and teaching, universities must improve quality and work in new ways.

Quality in University ICT Departments: Moving forward

Areas such as Information and Communication Technology (ICT) are relatively new and there is great scope for improvement and innovation in teaching, research and quality enhancement.

Over three years we have examined ways of enhancing the research process, trialling our approach on Computer Science Masters students and their projects. Our approach builds on previous work examining the needs of the university environment and simulated a dramatic infrastructure change to enhance both quality and productivity. The approach encourages students to map out and manage their research process in a similar way to how they might manage a software development task. Drawing on the lessons from QAA in both England and Scotland, we opt for an enhancement-led approach with guidelines and major themes, while still allowing flexibility tailored to the individual's strengths rather than a one-size-fits-all style of management. The Personal Process Model we introduced along with Coding Guidelines allowed information on research ideas, methodology, and critical decisions to be documented and shared. The infrastructure change involved both the introduction of these and other tools, and the concept of an in-house software development lab to assist researchers. Researchers would have access to software engineers to help them plan and manage the quality of their software development work and research products.

Personal management of your research process

The Personal Process Model allows a collation and sharing of process based information, but leaves the researcher in control

The Personal Process Model captures the ideas, plans, current activities and process history of a researcher. It maps the integration of activities with tools, and resources with needs. A Personal Process Model built by the researcher provides a real-time view into their work, and allows feedback from domain experts, supervisors and colleges. At a departmental level issues can be systematically addressed and real world impact assessed. With more process knowledge of the day-to-day activities of students and researchers within a department, a greater understanding of both concerns and best-practice can merge from the ground up. The process approach to research would integrate well with a university's overall quality assurance activities. The critical component is maintaining researchers' control of their process data, and ensuring the anonymity of their feedback as it filters from personal reflection through to institutional consideration.

Professional support for research products

**The in-house Software Development Laboratory**

Computer Science departments have generally been funded not as science departments, but along the model of mathematics. Imagine a chemistry lab without lab technicians and problems of this approach begin to emerge. In our experiment we simulated the existence of an in-house Software Development Lab which created tools and approaches tailored to the research environment and which aimed to improve the research process of our experimental subjects. We additionally created plans for such a laboratory to RESET (re-engineer) research projects and manage their archival and reintegration into new projects. Such reuse would give a department a strategic edge, allowing cutting-edge work to build on a stabilised mature platform that expands as new research is completed, then itself stabilised and integrated into the lab's resources ready for the next researcher to use. This would allow new students to do more with less effort, and would also provide an additional level of support and knowledge-sharing, of benefit to both staff and students. Issues such as the inheritance of poor quality code could then begin to be addressed.

Outcomes

Five percent personal improvement for participants and positive interview feedback indicates a way forward

Our experiments showed that students regarded quality improvement as the greatest benefit of the new approach. While students did not expect this to have an impact on their grades, analysis of the marks showed that students who participated improved by 5.04% on their prior coursework marks, while non-participants only improved by 1.44%. This is from a sample of 23 participants and 25 non-participants collected over two years.

RAISER / RESET: A software development lifecycle for the academic environment

The autogenerated overview diagram of a Personal Process Model
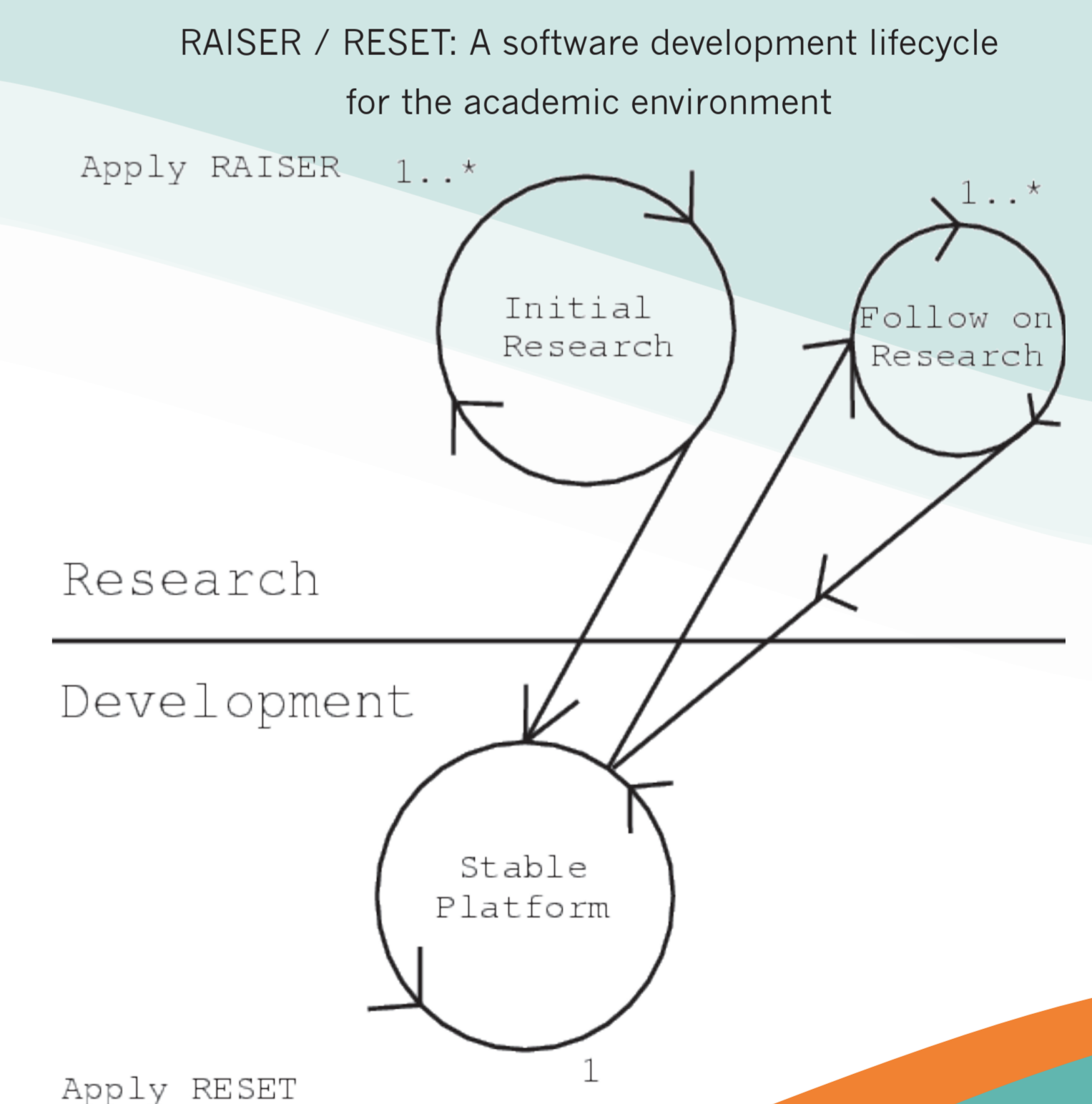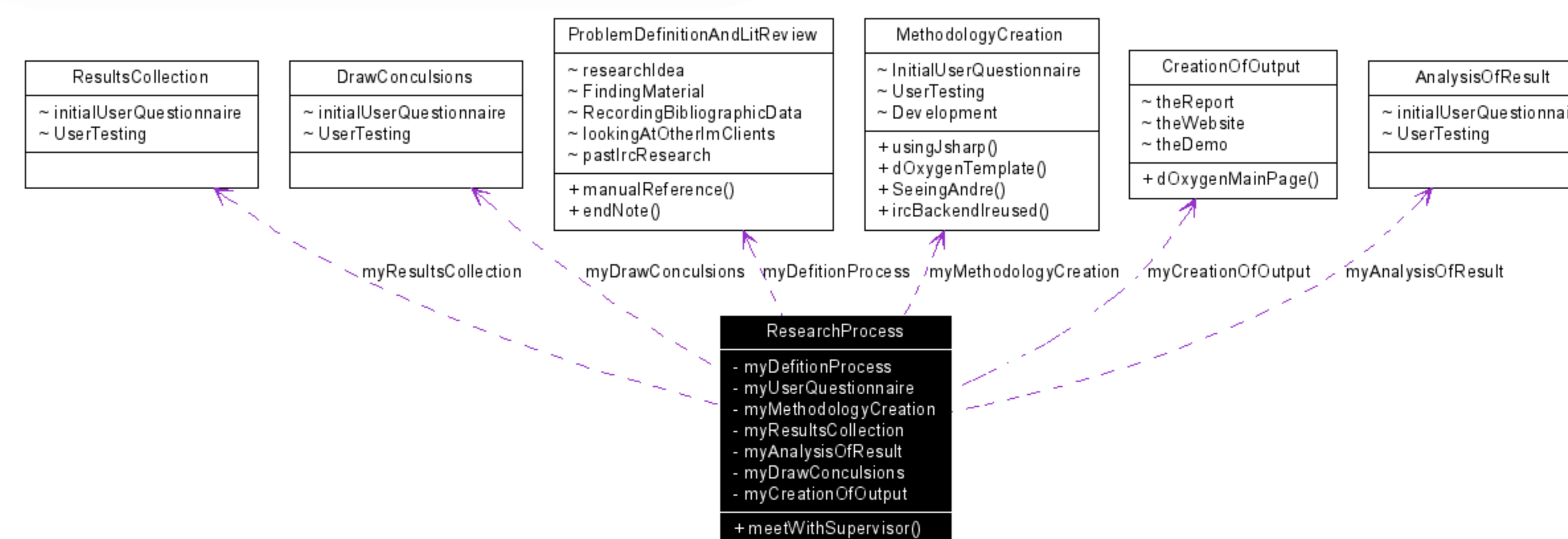
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For "Emerging landscapes: Research into quality management in higher education"
A QAA and SRHE joint conference for postgraduate and newer researchers