

2014 UCISA Award for Excellence

Application Form

Institution Name

University of Edinburgh

Originating Department

This is a joint submission from the Student Systems Division (University Secretary's Group) and the Applications Division (Information Systems Group).

Contact Name (and email address)

Lisa Dawson (Lisa.Dawson@ed.ac.uk) – Student Systems Division

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Project Name

Path: From Student Innovation to Central Service.

Objective of the Project

To exploit the innovation demonstrated by two students in the School of Mathematics and develop their web-based course selection tool into a university-wide supported service for all students.

Description of the Project/Service

This project originated with a system called Path, written by two students in the School of Mathematics to help students in deciding which courses to choose for their next year of study.

The vision for Path was not just to validate a student's choices, but guide them to making better and more balanced choices to build the degree programme that's best for them. To do this we needed to improve the information available to students when choosing courses, improve our tools to better aid the process of finding and picking courses, and better highlight the impact of a student's overall choices on the degree and skills they will obtain.

The University of Edinburgh has a very wide curriculum and offers an enormous choice which is fantastically flexible but has complex rules around which courses (modules) are eligible for which degree programme. Using a modern web-based presentation, Path showed which courses depended on others as prerequisites and took information about the user's past courses to show which future courses were open to them. Path enhanced this official information with moderated feedback about each course from students who had taken that course.

Path was a huge improvement in student information systems and its authors had shown great initiative and innovation in developing it. Before Path, information about courses was available via the University's Degree Regulations and Programmes of Study (DRPS) system. This is a legalistic system modelled on a paper-based original system and was primarily designed to satisfy university regulations rather than supporting students in their course selection.

Although the description of each course on DRPS did list its prerequisites and the description of a programme did list the available options, the system did not provide an easy way to navigate this information. The initial version of Path was fed from a single spreadsheet kindly provided by the school. Path enabled this information to then be presented in a user-friendly format.

This was the starting point: an innovative prototype that had demonstrated its utility within just one of the University's 22 schools. The project put forward for the UCISA Award for Excellence is what followed: the transformation of this prototype into a core University service, with the two original authors employed by Applications Division to make this happen.

This development was also an innovative process for the University. A working prototype is not the same as a robust, scalable and centrally supported service and the development of this service involved some risk-taking from the management in supporting the idea and paying the salary of the two developers. The initiative faced resistance and concern around a number of areas: using an IT system developed by students instead of professional developers, allowing students to give feedback on courses that was accessible by other students and reluctance to show data which may have been out of date or otherwise lacking in quality. However, the risk has paid off.

The result of this project is a service which is available to students across the university. Path has been accessed by 11,500 unique users (9700 students, 1800 staff) with 100,000 visits since the full service was launched in July 2014. Peaks of usage are visible. Some schools provide the full functionality while others are more cautious and have disabled the student feedback facility. This customisation allows schools to proceed at their own pace and provides a measure of local control.

Enhanced functionality proving popular amongst students is the topics function. In use within Physics and Mathematics, this functionality enables the student to browse the course catalogue and filter by topics such as nuclear and particle or quantum physics aiding a degree programme to be built within fields of interest.

Sample Feedback from Students

"Looks very good, very useful overview when choosing courses, gives a good overview of the courses, reviews are very useful"

"Amazing system; I would really struggle choosing courses and timetabling otherwise."

"1,000,000 times better than DRPS"

"It was easy to use and made picking courses a lot easier!"

"It's great, so much easier to understand your degree programme and others for that matter!"

"For students this is invaluable."

"Useful does not even cut it for Path. It MUST be expanded to other schools."

"Fantastic site, so much easier to find out info on courses and build and view your timetable..."

"... I wish that I could have used Path when I was in first and second year to choose my outside courses more carefully, using the student reviews and the prerequisites features. As it is, I hope to benefit from it choosing my courses for fourth year!"

"Good for letting students know about courses from a student perspective, needs to be advertised more. Helpful and clear, would like to be able to see timetable clashes."

Project details

The project was implemented in two phases. These were managed as separate projects following the University of Edinburgh's projects methodology and information about them can be found on the university's Projects Web Site. These projects combined the insight brought by the original student developers with the robust development skills of existing Applications Division staff and the service management of Student Systems.

The first phase extended the initial Path prototype from the School of Mathematics to additionally support the School of Engineering Science and the School of Physics and Astronomy. This involved changing the system to support multiple schools, which was an essential step on the journey of supporting schools across the university. It also demonstrated that the system had benefits beyond its original school. See <https://www.projects.ed.ac.uk/project/sce001>.

The first phase also moved the system from a local PC to the central virtual hosting service, thus providing a higher level of infrastructure support. Actual service support at this stage was provided by the original developers and Applications Division, so this phase of the work was primarily led by Information Systems.

Having proven the capability of the system in phase one, the second phase transformed this nascent service into a fully-fledged service under the wings of Student Systems. The system was migrated onto the university's corporate infrastructure, providing a resilient dual-site capability. The program itself was rewritten to take its data from corporate data feeds instead of screen scraping, thus providing a more robust interface. This work is documented at <https://www.projects.ed.ac.uk/project/sce003>.

Usage of the service has expanded since the transition to a Corporate Service with 20 of the University's 22 Schools now fully engaged with Path. Support is provided by Student Systems. The Path rollout has been a planned rollout to ensure support was in place for all Schools. The target is to have all Schools fully engaged by summer 2015.

Further Development

The Path tool is currently an exploratory tool. Choices from students can be saved and printed but do not feed into more advanced workflows. A development request from students supported by Personal Tutors is to enable the student to send their proposed choices to the Personal Tutor ahead of their first meeting to better inform their discussion. This enhancement will be introduced for the 2015/16 academic year.

Opportunities have arisen from the success of Path across the University. Whilst there has been little appetite for the feedback mechanism due to established methods in place such as Evasys,

discussions are now underway to extract the course evaluation information from Evasys and integrate with Path, as this is a quality approved process. This has been much more favourably received by schools.

There is much appetite to integrate data to support undergraduate students from the Key Information Set (KIS) to provide greater detail about most popular pathways. This is very much welcomed by students studying within Schools that offer greater flexibility of curriculum.

The same approach used to build Path could be followed to produce a system for people who are thinking of applying to the University, to help them select the most appropriate programme of courses. This would require some further development to support the comparison and selection of programmes rather than of courses within a programme.

Return on Investment

Phase 1 of this work was carried out by Applications Division. As shown on the University's Project Management Website, this took 217 days of effort. At the Division's standard day rate, this is equivalent to £58,590.

Phase 2 of this work was led by Student Systems, with Applications Division providing the technical development (by way of the original authors, who were taken on as employees). This took 130 days of Applications Division time, which is equivalent to £35,100. Student Systems themselves spent a maximum of five hours with each School. This included the introductory meeting to demonstrate Path and explain the benefits of this tool, follow up meetings with key staff who will administer the tool, and training for both key staff and student class representatives where Schools have chosen to enable the advanced functions such as feedback. A maximum of 100 hours of staff time has been spent by Student Systems supporting the rollout.

The benefits from this project have been priceless. The system has hugely improved the student experience by helping students to predict the impact of their course selection and by providing feedback on courses. The system has reduced the reputational risk to the institution by removing problems of students finding too late that they were ineligible for their desired courses. Other benefits include the following:

- a. Student feedback was almost uniformly positive
- b. Staff learned about how students regard their courses and made changes
- c. The quality of programme and course information has improved markedly
- d. The project has been presented at two external conferences
- e. The students hired by Information Systems have become valuable employees.

Sample Feedback from Staff

"I have found Path to be an excellent support tool for both students and staff. Clearly designed with the user in mind, it allows us to explore the structure of degree programmes and the optional courses available throughout the University. Moreover, students can see what combinations of courses look like (identifying any possible clashes at the click of a button) before making their final decisions. The sooner all current and prospective students (as well as all staff) are aware of and using Path, the better!"

"I think Path is an excellent resource. Just being able to see an overview of how our courses fit together is particularly useful when talking to tutees about their course choices and so much easier than wading through DRPS. The fact that it is also very easy to find prerequisites - and what a particular course is a prerequisite for - is a bonus."

"I've found Path enormously useful as a new member of staff. The front page gives a completely clear overview of what courses there are. Arriving at a new place, there's a lot to absorb about how the programme is structured, and DRPS isn't well-suited to learning this. I have consulted Path dozens of times for that reason alone."

Contribution to the Institution and Excellence

The University of Edinburgh's strategic goals are: Excellence in Education; Excellence in Research; and Excellence in Innovation. This project contributes directly to providing Excellence in Education: the provision of course information and structures through Path supports the key transitions that students go through (Transitions is the current sector wide enhancement theme selected by the HE sector in Scotland); provides Personal Tutors and other staff with the information and tools to enhance the support provided to students, and overall forms part of the programme of activity seeking to enhance the student experience. The process of producing the Path system demonstrates Excellence in Innovation, taking a system that was developed by two students in one school and developing it into a University-wide system. The process is analogous to starting with the in-house equivalent of a start-up company and providing the venture capital it needed to develop a fully-fledged system.

The success of this process sets an example for future initiatives. Information Systems and Student Systems will be open to adopting similarly innovative systems in the future. We are considering sponsoring a competition for student projects in this vein.

Transference of Best Practice

We have created a series of guest accounts enabling other institutions to access Path. A range of accounts have been created to simulate the application a student will be presented with throughout their years of study. Log in details can be found within the appendix.

The University of Edinburgh grants full permission for UCISA to publish details of this application. *Please see exception of test login details within the appendix.

Supporting statement from Assistant Principal (Learning & Teaching)

"Path has been a tremendous development on a number of fronts: it is a student-led initiative which has grown to have a positive impact across our student community; it has greatly enhanced the way we present our course information to students and as a result has improved the quality of the information we publish; it has provided tools which support both students and Personal Tutors navigate key transitional stages; and has been an excellent example of colleagues working in partnership to enhance the student experience." **Professor Ian Pirie, Assistant Principal (Learning & Teaching).**

Names of Staff involved (including job titles, email addresses and project roles)

Simon Marsden: Director, Applications Division (Simon.Marsden@ed.ac.uk) – project sponsor

Lisa Dawson: Head of Student Systems Operations (Lisa.Dawson@ed.ac.uk) – project sponsor and service owner

Greg Tyler: Developer (Greg.Tyler@ed.ac.uk) – developer and student designer of original system

Paul Horrocks: Developer (Paul.Horrocks@ed.ac.uk) – developer and student designer of original system

Peter Jackson: DBA (Peter.Jackson@ed.ac.uk) – technical architect

Franck Bergeret: Project Manager (Franck.Bergeret@ed.ac.uk) – project manager

Dr. Dave Berry: Head of Development Services (Dave.Berry@ed.ac.uk) – software development manager

Prof. Michael Singer: Head of School, School of Mathematics (no longer at the University) – sponsor of the original Path system

Dr. Gordon MacDougall: Dean of Quality, College of Science and Engineering (Gordon.MacDougall@ed.ac.uk) – senior user

Dr. William Hossack: Senior Lecturer, School of Physics and Astronomy (William.Hossack@ed.ac.uk) – business lead

Support of Institution UCISA Representative

Gavin McLachlan, CIO (Gavin.McLachlan@ed.ac.uk)

Appendices

The Path Homepage

The screenshot shows the Path homepage with a dark blue header. The header includes the University of Edinburgh logo, the text 'THE UNIVERSITY of EDINBURGH | Path', and navigation icons for HOME, COURSES, DEGREES, FEEDBACK, MY COURSES (with a '13' notification), and SETTINGS. A search bar is on the right. Below the header, the main content area is titled 'Home'. The central feature is a 'Choose courses' section with a large blue arrow icon. It includes a 'Please note' box and a 'Launch the programme builder' button. To the right, there are three menu items: 'Choose courses', 'Browse degrees', and 'Browse courses', each with a list of links. At the bottom, there is a 'Hints' section with a 'Semester 1' and 'Semester 2' view, showing course requirements and a 'BUILDER!' warning.

The Path homepage from the perspective of a student; with one click a student can open their degree in the Programme Builder and begin choosing courses on their degree, viewing all options available based on the courses they have taken in each year.

Online tutorials

Courses on Path

<http://youtu.be/ihFeMMPk9xo>

Path: Using the programme builder

<http://youtu.be/EUZ1UKorBH0>

Programme Builder

The screenshot displays the 'Programme Builder' interface for the 'Mathematics (BSc Hons)' program. The top navigation bar includes the University of Edinburgh logo and the text 'The University of Edinburgh | Path'. Below the navigation bar, the program title 'Mathematics (BSc Hons)' is visible. The main content area is divided into two sections: 'Selected Courses / Levels' and 'Detailed View of'. The 'Selected Courses / Levels' section shows a hierarchical view of the program structure, with 'Year 1' at the top, branching into 'Semester 1' and 'Semester 2'. The 'Detailed View of' section shows a list of modules, with the 'Year 1 Honours Mathematics' module selected and expanded. This expanded view shows the module's details, including its title, credits, and a list of modules. The 'Year 1 Honours Mathematics' module is further detailed, showing its structure across 'Semester 1' and 'Semester 2'. The 'Semester 1' section includes a list of modules such as 'Mathematics 1A', 'Mathematics 1B', 'Mathematics 1C', and 'Mathematics 1D'. The 'Semester 2' section includes a list of modules such as 'Mathematics 2A', 'Mathematics 2B', 'Mathematics 2C', and 'Mathematics 2D'. The interface is designed to allow users to build and customize their program of study.

The University of Edinburgh Path: From Student Innovation to Central Service

The example provided is the programme builder for a final year Mathematics student. Courses they can take are coloured blue, courses they cannot take (due to not meeting course requirements based on previous choices) are red, and courses they have selected are green. The programme itself is coloured to show where the student is meeting the rules for it, and with one click they can generate a timetable based on the current selection.

Course (module) Information

The screenshot displays the Path website interface for the course 'Introduction to Linear Algebra'. The page is structured with a top navigation bar, a breadcrumb trail, and several content sections. The 'Description' section provides an overview of the course content. The 'Assessment' section features a bar chart showing 85% written examination and 15% coursework. The 'Future courses' section includes a diagram showing prerequisite relationships. The 'Follow up courses' section lists related courses. The 'Statistics' section provides key metrics like years running and student reviews. The 'People' section lists the course organiser, secretary, and lecturer. The page also includes a search bar, navigation icons, and footer information.

Navigation: Home, Courses, Degrees, My Courses, Settings, Search...

Breadcrumb: Home > Courses > School of Mathematics > Introduction to Linear Algebra

Course Title: Introduction to Linear Algebra

Course ID: MATH08057 | **Credits:** 20 CREDITS | **Level:** LEVEL 8 | **Year:** YEAR 1 | **Semester:** SEMESTER 1

Buttons: Remove from my courses, Open Timetable

Overview Tab: Information, Requirements, Student Reviews (14)

Description: An introduction to linear algebra, mainly in \mathbb{R}^n but concluding with an introduction to abstract vector spaces. The principal topics are vectors, systems of linear equations, matrices, eigenvalues and eigenvectors and orthogonality. The important notions of linear independence, span and bases are introduced. This course is preparation for the practical using of ideas around vectors, matrices and linearity and also lays the groundwork for a more abstract, pure-mathematical treatment of vector spaces. Students will also learn how to use Maple for some simple matrix operations.

Assessment: 85% Written examination, 15% Coursework

Assessment details: Coursework 15%, Examination 85%

Future courses: Introduction to Linear Algebra (20 Credits - Level 8) is a prerequisite for: Discrete Mathematics and Mathematical Reasoning, Facts of Mathematics, Fundamentals of Pure Mathematics, Informatics 3B: Algorithms, Data Structures, Learning, Linear Algebra and General Vector Calculus, Mathematics for Physics 3, Modern Physics, Music Applications of Fourier Theory and Digital Signal Processing, Probability, Probability with Applications.

Follow up courses: Calculus and Its Applications (20 Credits - Level 8), Proofs and Problem Solving (30 Credits - Level 8), Honours Analysis (30 Credits - Level 10), Honours Algebra (20 Credits - Level 10).

Statistics: Years running: 4, Compulsory part of: 30 degree programmes, Primary course activity: Lectures (See all course activities), No. of student reviews online: 14, Prerequisite for: 10 courses, There are requirements imposed to take this course.

Recommendations (2013/14): Not yet received enough feedback on this course. We don't show recommendations until we've received a vote from at least 10% of the class. We need votes from 29 more students who took the course in 2013/14.

People: Course Organiser, Lecturer: Dr Toby Bailey (t.b.bailey@ed.ac.uk); Course Secretary: Ms Louise Durie (L.Durie@ed.ac.uk); Lecturer: Dr Tadahiro Oh (t.oh@ed.ac.uk).

Footer: Path Version 4.0, developed by JS Applications. Unless explicitly stated otherwise, all material is copyright © The University of Edinburgh 2013. The University of Edinburgh is a charitable body, registered in Scotland, with registration number SC005336. Website Accessibility | Help. Entypo pictograms by Daniel Bruce. The University's definitive record of programme and course information which governs a student's academic career is the DRPS (Degree Regulations and Programmes of Study). This is a repository of all of the courses offered by the University and provides information on which courses you need to take on your degree programme and which outside courses you make take. Path is not part of the academic regulatory framework but uses information from the DRPS to support students consider their degree pathway, review outside course choices, understand co-requisites and pre-requisites and generate a timetable. The content of individual courses and the programme for any given degree are under constant academic review in light of current circumstances and may change from time to time, with some programmes and courses being modified, discontinued or replaced.

A course on Path with information from central sources, lecturers, schools and students broken down into tabs including the "Student Reviews" tab showing course reviews written by students who previously took the course.

Presentations given

Event	Date	Presenters	Title	Links
QAA Enhancement and Innovation in Higher Education, Glasgow	June 2013	Paul Horrocks & Greg Tyler	“Path: A student led, online course selection and programme builder”	Paper available at: http://bit.ly/16qb54y
Partnership in Assessment and Feedback, University of Edinburgh	April 2014	Fiona Littleton & Paul Horrocks	“Mapping Programmes”	Slides & recording available at: http://bit.ly/16iANaV
The Academic Fair, University of Edinburgh	September 2014	The Path support team	“Path: Choosing (and timetabling) optional courses”	
Gearing up for Transition, University of Edinburgh	<i>Upcoming</i> March 2015	Lisa Dawson & Paul Horrocks	“Path: building the right degree programme for you”	
SROC Breakout session, University of York	<i>Upcoming</i> March 2015	Lisa Dawson & Paul Horrocks	“Path: Leveraging student innovation to solve corporate problems”	Details available at: http://bit.ly/1DzyET6
ELIR Showcase, University of Edinburgh	<i>Upcoming</i> October 2015	<i>Unconfirmed</i>	<i>As yet untitled</i>	

Access Path as a student

In order to simulate entering Path as a student, a collection of test accounts has been created. The details can be found within the table below. Accounts can be accessed via <https://test.path.is.ed.ac.uk/>. The table below also notes which year and programme the simulated student is in. If you require support to log in please contact studentsystems@ed.ac.uk.

Email address / EASE Login	Password	Year	Programme
path.test.student.001@gmail.com	!HgwLNQlmlu	2	Electronics and Electrical Engineering (BEng Hons)
path.test.student.002@gmail.com	!VvbwIhqNHg	1	Mathematics with Management (BSc Hons)
path.test.student.003@gmail.com	!ANM7ojE6ty	2	Mathematics (BSc Hons)
path.test.student.004@gmail.com	!8FkAyXzOn0	1	Electronics and Electrical Engineering (MEng Hons)
path.test.student.005@gmail.com	!eOxSXIN8Ni	4	Mechanical Engineering with Management (MEng Hons)
path.test.student.006@gmail.com	!YFfJhjfhsP	2	Physics (BSc Hons)
path.test.student.007@gmail.com	!g1IOiyLSNY	1	Civil Engineering (BEng Hons)
path.test.student.008@gmail.com	!V2RGkRGkgo	3	Mathematics (MA Hons)
path.test.student.009@gmail.com	!6LHcNI6oOU	1	Mathematics (MA Hons)






*Please do not share the test log in details without the permission of The University of Edinburgh.

Art work to promote the service


Path

<http://path.is.ed.ac.uk/> **MyEd > Studies > Path**


A support tool for choosing optional courses and building your degree programme.

-  Choose courses straight from your degree programme.
-  Browse available outside courses in other schools.
-  Generate combined course timetables and check for clashes.
-  Validate your selections against degree programme rules and course requirements.*
-  Read student feedback on courses.*

* Not available in all Schools.



 @UoEPath
StudentSystems@ed.ac.uk

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Student Systems

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of **EDINBURGH**
Student Systems

Path

<http://path.is.ed.ac.uk> MyEd > Studies > Path

A support tool for choosing optional courses and building your degree programme.

-  Choose courses straight from your degree programme.
-  Browse available outside courses in other schools.
-  Generate combined course timetables and check for clashes.
-  Validate your selections against degree programme rules and course requirements.*
-  Read student feedback on courses.*

 [@UoEPath](https://twitter.com/UoEPath)
StudentSystems@ed.ac.uk

* Not available in all Schools.