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EVALUATION OF THE ROLE OF AN INTENSIVE INDUCTION PROJECT IN ENHANCING THE FIRST YEAR EXPERIENCE

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Abstract
In line with increasing global efforts to improve the first year experience of 3rd level education Dublin Institute of Technology’s School of Spatial Planning undertook, in both 2007 and 2008, a 2-day Deep-End Induction project. With the introduction of modularisation in Ireland’s Institutes of Technology opportunities arose for the identification of overlaps and synergies between programmes. Within the authors’ School three honours Bachelor of Science degrees in Geomatics, Spatial Planning and Environmental Management are taught annually. The Geomatics graduates are mainly engaged in the production of maps and models on national, regional and local scale as well as the management of spatial data in Geographic Information Systems and through appropriate Land Management processes. The Environmental Managers and Spatial Planners are prime users of these datasets. All three student groups benefit from the development of an understanding of each of the other disciplines and this led to the introduction of basic modules in each of the three subject areas, delivered jointly to the three cohorts during semester one of the first year. Experience in the first year of joint delivery of modules (2006) indicated that students had difficulty understanding the relevance of these modules and the reasoning behind the joint delivery. It was also found that few students mixed outside their own cohort even when scheduled in cross-disciplinary teams for assignments and practical work.

In an effort to address this issue staff developed an induction project which placed students from the three programmes into teams and tasked them with the design of a route for a high-voltage power line. The students were given a detailed briefing (both en masse and in separate cohorts to explain the specific role of each professional in the design team), were provided with a range of online Irish mapping, environmental and planning tools, and were required to design, visit and evaluate two possible routes to match specific natural, social, engineering or landscape criteria between defined start and end locations.

The deliverables were a brief report and a presentation proposing one of the designed routes. The presentation was made to the full cohort of students and staff from across the school and was delivered as if at a Planning Consultation meeting, with each group in turn taking the role of the design team trying to convince an audience of interested local parties of the benefits of their proposal.

The real outcomes, however, were the introduction of students to their cohort and the wider grouping of students across the school, to the related disciplines of Spatial Planning, Environmental Management and Geomatics, to a range of tools (both educational, such as the Webcourses VLE, and subject specific), to staff at the school and to some 3rd level teaching methods.

Feedback from students indicated that they found the project to be a success, both from social and educational perspectives, with the Geomatics students seeing less educational and more social relevance, possibly because of the specific topic chosen for investigation. Current anecdotal evidence has shown better mixing between cohorts during joint practical and project work. The authors also intend to carry out a further evaluation of results of the induction project when the students have completed one full stage (2 semesters) of their programmes.

Keywords
First-year experience, transferrable skills, collaborative work, cross-disciplinary alignment, real-world problems, Innovation, technology, research projects

1. Introduction
As has become the case for many institutes of higher education in Ireland and Britain the issue of student retention has gained high priority at the Dublin Institute of Technology (DIT). This is the result of the impact of completion rates on policy decisions relating to educational budgets.
Research in the United Kingdom into the reasons for non-completion of the first year of programmes has identified a number of possible reasons for student departure: the difficulty of the programme, a lack of personal engagement with the programme, the method & quality of teaching, lack of staff contact, quality of feedback, overall organisation of the programme, difficulty in making friends [1]. While comparable statistics do not exist for Ireland anecdotal evidence suggests similar patterns. Cognisant of these issues institutes, schools and programmes are investing heavily into the improvement of the 1st year experience in an effort to ensure that students do not leave due to reasons that are under the control of faculty or institutional support staff. At DIT’s School of Spatial Planning a number of these issues were addressed during the redesign and modularisation of three undergraduate honour BSc. programmes in Spatial Planning, Environmental Management and Geomatics.

In this paper we describe in context one specific initiative undertaken as part of the overall redesign of the above-listed programmes. Firstly we provide some background into the three programmes and the professions for which students are being prepared. In the next section we discuss the alignment between these programmes and the usage of three joint modules to provide our students with essential insights into the knowledge-base of professional with whom they will almost certainly work during their careers. The following section details the intended outcomes of the induction project which was introduced as a pre-cursor to the joint modules, as well as the details of implementation. The final section discusses feedback on the results of the induction project from the perspective of staff and students.

2. Programmes and Professions

At the School of Spatial Planning, DIT, Bolton Street, three undergraduate honours Bachelor of Science degree programmes run each year. In line with DIT’s quality assurance procedures each programme is revalidated after a period of five years and these validations provide an opportunity to reassess the technical content as well as the pedagogical methods in order to ensure that students are receiving the best possible preparation for a developing marketplace, both in Ireland and abroad. As part of the last sequence of revalidations an extra element was added in the shape of modularisation which has been adopted throughout DIT’s suite of programmes. This provided an opportunity to examine possible synergies between programmes and to identify both efficiencies in delivery and benefits to students.

2.1 Geomatics

The BSc. in Geomatics is a four year honours degree programme qualifying professionals for careers in all aspects of the surveying and geographic information industries. The programme is accredited by the relevant professional bodies in Ireland and the United Kingdom through which world-wide recognition is guaranteed via the International Federation of Surveyors (FIG). It is the only programme of its kind in Ireland. Reviews of the history of the programme and recent changes made to its structure in recognition of the changing demands on graduates can be found in [2] and [3]. The currently operating structure of the programme is depicted in Figure 1 BSc. Geomatics Syllabus (2006 – present). Most notable in the context of this paper is the inclusion within the first semester of an Overview section. This category provided an opportunity to introduce students to the range of career options available to graduates of the programme, typically in the fields of Measurement Science, Spatial Information Management (including Geographic Information Systems (GIS)), or Land Management, and to connect this discipline with a range of key application areas and associated professions.
In the previous structure of the BSc programme students undertook mandatory modules in Introduction to Spatial Planning and Introduction to Environmental Management during the fifth semester. Faculty felt, and feedback from students indicated, that these modules occurred too late in the programme at a time when critical attention needed to be paid to core modules such as Geodetic Survey, Remote Sensing, Land Management and Geographic Information Science. Furthermore, the introduction of a Work Placement module in the 5th semester reduced the amount of available teaching time in the final two years and served as a catalyst to push the modules covering specific application areas into the earliest stage of the programme.

A further issue for graduates of the Geomatics degree is the difficulty in identifying a clear career path. This issue is rarely a problem for graduates because of the wide range of opportunities available following qualification with a highly-rated, accredited, broadly applicable degree. However, for students starting on the programme the issue of professional identity can be a significant barrier and faculty felt it to be important to try to resolve this issue as early as possible by demonstrating the typical roles played by a geomatics professional in a multi-disciplinary development team.

2.2 Spatial Planning

The BSc. in Spatial Planning is also a unique offering in an Irish context where planning qualifications are usually achieved at MSc. level and graduates of this undergraduate programme are professionally accredited by the Irish Planning Institute. Upon graduation spatial planners frequently work in the public sector where they make decisions which influence the future distribution of activities in space with the aims of creating a more rational territorial organisation of land uses and the linkages between them, of balancing demands for development with the need to protect the environment, and of achieving social and economic objectives. In the private sector graduates often work on behalf of individuals or groups, providing expert guidance on details of the Irish planning process and formulating applications or appeals in relation to specific development activities.

2.3 Environmental Management

Graduates of the Environmental Management BSc. bring a unique range of skills to their professional careers where they typically aim to attain sustainable use of the earth’s resources, protect and enhance the quality of the environment and realise social and economic objectives. This programme of study embraces the management of enterprises and activities with full consideration of ecological principles and the sustainable use of natural resources and is carried out in both the public and private sectors. Graduates of the BSc. in Environmental Management offer a distinctive perspective on national and local development due to the shared education that they receive with students of spatial planning through the use of joint module delivery.

2.4 Joint Modules

As has been previously mentioned, students from the Spatial Planning and Environmental Management programmes take all of the same modules during stage one as well as six and five shared modules in stages three and four, respectively. These joint deliveries have been very successful and upon examination it was realised that the two “Introduction to” modules for the two programmes could also be readily delivered to the Geomatics students as well.
By delivering to all three cohorts jointly a reduction in costs could be achieved and students would be introduced to a wider cohort than would otherwise be typical. Within the Geomatics programme one solution to the afore-mentioned problem of identity was the idea of creating an “Introduction to Geomatics” module. However, if that was the only focus of the module it would not serve to solve the issue noted by staff of the Spatial Planning and Environment Management programmes of the lack of spatial awareness skills demonstrated by students at stages 3 and 4 (semesters 5-8). The decision was therefore made to create a single module, entitled GeoSpatial Awareness to improve spatial data handling abilities for planners and environmental managers, while setting the context for interdisciplinary information usage from the perspective of a Geomatics student, fulfilling the “Introduction to” role.

The first delivery of the joint modules was reasonably successful with students from all three groups engaging to approximately the same level with each of the three modules. Questions did, however, arise in relation to the reasoning for joint delivery of the modules. Both in lecture theatres and laboratory classes students tended to congregate in their own cohorts and mixing was minimal. This was further compounded by the operation of separate tutorials for one of the modules where, although the content delivered was the same, through the separation of student groups a perception arose that the materials were different. In GeoSpatial Awareness a small group project was employed as part of the assessment strategy. Groups were mixed between cohorts but students expressed a lack of understanding of the reasons why this exercise was beneficial to all three careers and why they would need to work collaboratively.

3 Induction Project

Following discussions about the results of the delivery of the joint modules faculty decided that an induction project, running before the start of formal classes, could address some of the problems of the lack of interaction between cohorts and, potentially, some of the issues relating to overall career direction.

The decision was made to formulate the project as a real-world based problem where students needed to function in multi-disciplinary teams in order to arrive at a satisfactory solution. The requirement of the project was that students, working in small groups of typically 4 students, would design and propose the route of a new high-voltage power line between an existing electricity substation and a Greenfield site. Each team comprised at least one student from each of the 3 cohorts with the goal of ensuring that the different perspectives would be represented.

3.1 Timing

The School Induction project was designed to run immediately after the general student Induction. At DIT, first year students undertake two days of Induction on a by Faculty basis in the week prior to the start of classes. During this time students register and are introduced to the Faculty of the Built Environment and its composite schools and departments. A range of student services such as support relating to Accommodation, Careers, Health, Disabilities, Counselling and the Students’ Union are presented and students are provided with guided tours of the campus and introductions to members of staff who teach on their programmes.

The School of Spatial Planning’s students returned to campus on the third day to receive a briefing on the format and outcomes of the Induction Project. The project would run until lunchtime on the final day of the week, affording students sufficient time to complete the requirements and to socialise through some formal events organised by the Students’ Union.

3.2 Intended Outcomes

The intended outcomes of the project could be grouped under three headings: academic, professional and social. The academic goals included introducing students to DIT’s virtual learning environment, Webcourses, and to the requirements of report writing and oral presentation supported by Microsoft Office software. With regards professional goals these included the programme specific requirements of introduction to key resources (Development Plans for Spatial Planners, Designated Area categories and maps for Environmental Managers and Ordnance Survey Ireland mapping for the Geomatics
group) as well as the cross-disciplinary needs of developing mutual understanding and awareness of the interdependencies of the three professions. With a social focus the goals related to trying to create an immediate effect on the first year experience by engaging students in challenging problems and introducing them to the cohort with whom they would undertake either all or many of their modules. Through use of a range of locations around Dublin the project also served to familiarize students with the city and its public transport system.

One aspect of the social side of the project which is particularly important for the geomatics programme relates to the current gender imbalance of the intake. In the 2008 intake, of the 30 students beginning the programme only two were female. This can be very daunting for these girls, particularly since a high proportion (50%) of Irish female secondary level education still operates in a single sex environment [4]. Introducing these students to the wider cohort, where the gender balance is closer to 50:50, often serves to alleviate one of the reasons quoted by Mantz & Longden [1] of difficulty in making friends causing students to depart during the first year of a programme.

3.3 Project Briefing

The briefing process involved two stages: a general information session for all students led by all three project tutors and a profession specific briefing which was designed to ensure that students understood the roles which they were expected to fulfil within the project team. These sessions explained the typical specialist input that each professional would make to a multi-disciplinary project based around a large-scale infrastructure development. The project brief included a description of the aims of the exercise, the required outputs and the timeline for completion. Each group of 4 students was provided with a 1:50,000 scale map displaying the start and end points of the high-voltage power line routes (each group was assigned to a different route within the greater Dublin area). While printed copies of the base map and the general project brief were provided all other materials related to the project were provided in digital format via the Webcourses VLE. This resulted in familiarisation of the students with this essential teaching and communications tool at the earliest possible opportunity.

Two tutors gave a short talk on the project and wider issues to do with Planning and Environmental Management to one group, which allowed the students to develop a sense of familiarity and identity. The briefing covered the relevance of infrastructure planning and optioneering to the planning process. This provoked certain questions: why is infrastructure needed; how should benefits and costs be distributed spatially and economically; to what extend and how can stakeholders - including the community - be included in the decision-making? The students were also asked to consider the planning regulatory framework: how are planning decisions made and what plans exist for target areas. Students interested in environmental management were told to consider what designations and restrictions apply to the areas of interest. Above all, the students were told to consider the Development Plan as the primary source of planning information and to use this as a critical part of their analysis.

In the briefing for geomatics students an amount of time was devoted to the issue of the identity of a geomatics graduate and the careers to which students could aspire. Although this would have been extremely useful to engage students in the collection of raw spatial data to provide base mapping for the project this was not possible due to the very limited time that was available. Therefore, in order to emphasise the geomatics input into multi-disciplinary development teams the design of the final proposal needed to include a height profile and the co-ordinates of each change of direction along the route in two national co-ordinate systems. Both of these elements are part of the knowledge that is often specific to the geomatics professional on a team but which are essential elements in creating successful applications which can be integrated with nationally held core datasets.

3.4 Project Implementation

In the first design stage the requirement for each group was to try to create four routes based on different criteria (Engineering Criteria, Natural Constraints, Social Sensitivities and Visual/Landscape Sensitivities) to link the two ends of the route. This section of these routes was undertaken as a desk study using a range of online resources such as those mentioned in section 3.2 and more generic mapping tools such Google Earth and Microsoft’s Virtual Earth. Upon completion of the desk study (end of day one) each group selected two of their possible routes which would be visited as completely as possible on the morning of the following day.
The two routes chosen were those which best suited the criteria in two of the available four categories – the groups had full autonomy of which two criteria to select. Students were encouraged to use public transport since the start and end points of the routes had been selected for their easy access.

In the afternoon the groups reassembled on campus to collaboratively write their reports, in MS Word, and to select one route to present, supported by MS PowerPoint, to the audience which they were required to imagine was composed of interested local residents. (The actual audience comprised the full student cohort and a number of staff, some of whom had been involved in the induction project and some who had not.) The presentations were to be designed as an argument designed to convince the audience of the merits of a specific solution. The final morning was completed by a presentation by two graduates of the Geomatics programme who both work with the Irish national electricity provider in the surveying and planning of transmission lines and telecoms infrastructure. These presentations were essential in demonstrating the validity of the process that the students had just undertaken and identifying potential careers upon graduation.

4 Results

The induction project ran for two and a half days in mid-September 2008. Each group of students produced a report detailing 2 routes and made a joint presentation to an audience of peers and faculty. The results will now be analysed in relation to the original goals and from the aspect of staff and students.

4.1 Academic

The academic goals were to introduce students to Webcourses and to the requirements of report writing and oral presentation supported by Microsoft Office software. All of these goals were achieved and staff noted that a very high proportion of the students already had excellent MS Office skills. This information was forwarded to lecturers teaching IT modules enabling more challenging learning outcomes to be set. With regards presentation skills the quality was again very high. The advantage of requiring students to make presentations when they do not yet know their cohort well is clear as issues of self-confidence are less problematic. A small number of students made an excellent effort to fully argue the case for their point of view while most were more concerned with presenting some facts but without being persuasive. These skills can be improved in Professional Development and Transferrable Skills modules throughout the programmes.

4.2 Professional

Here the goals were the introduction of key resources for each of the disciplines as well as the development of mutual understanding with regards professional careers and roles within project teams. It is difficult to gauge the success of this outcome since this will not become apparent until later in each programme. However, it has been noted that in the practical classes of the GeoSpatial Awareness module students from the Planning & Environmental Management programme have frequently sought help from members of the geomatics cohort. It is unclear whether this is the result of friendship or the identification of superior professional knowledge on the part of the Geomatics students as they gain more specialist knowledge as a result of work undertaken in other modules.

4.3 Social

The most obviously successful outcomes were the social ones. During the induction project itself the cohorts mixed very effectively and in subsequent joint modules a good level of interaction could be observed, both in relation to project work and social interaction. The Student Societies run by all three cohorts ran a joint Christmas social event, something which was unprecedented before the introduction of the joint modules.

4.4 Staff

In the results according to staff two categories exist: those who ran the project and those who subsequently taught the students, either in joint or individual groups.
From the perspective of the project organisers it was a great success. All of the students engaged fully in the process and the outward impression given was that it was enjoyable and helpful. Certainly the quality of the students’ organisation, presentation making and report writing was notable and the project clearly demonstrated that problems which cause students to think and act independently or only with peer support can be very successful. Staff who observed the presentations without having seen the project brief or any of the progress sessions were very impressed with the quality of the final outcomes and encouraged by the level of interest shown by the students.

The induction project allowed staff within the School of Spatial Planning to communicate an important message. Being part of a project team and having to integrate with other skill sets and expert groups is more and more critical to successful planning and environmental management. Being able to involve students in such an integrated design-team process at this early stage was a profoundly practical opportunity. Effectively, it enabled staff to prepare student mindsets for becoming solution-focused in a real-world environment at the earliest possible stage. It also gave the students a sense of excitement about the project that was perceptible and welcomed. It is certainly hoped that this practical, integrated attitude can be nurtured and maintained throughout the academic lives of the students.

4.5 Students

The students were asked to complete a questionnaire in order to elicit feedback from them about the Induction Project. The questionnaire was a voluntary survey distributed through a joint module later in the semester. The overall response rate was reasonable, although a higher response rate came from the Planning and Environmental Management (PEM) students (17 respondents from a possible 35) than from the Geomatics (GEO) students (5 respondents from a possible 26). Nevertheless, 22 respondents from a possible 61 was considered a significant sample. Also, in general, responses were broadly similar between PEM students and GEO students.

Section 1 of the survey enquired into the Induction Project as a process (Figure 2). A positive response was received in each area. 73% of students felt the clarity of the brief was either fair or good. 96% of students felt support from staff was fair to very good. 100% of students felt that feedback from staff was fair to very good. 82% of students felt that IT resources made available were either good or very good. Finally three quarters of students felt that information resources made available were either good or very good. Responses between the two groups were broadly similar, although GEO students had a much higher regard for resources made available. For example 100% of GEO students said IT resources were very good.

![Figure 2: Responses to Student Questionnaire Section 1](image-url)
Section 2 of the survey examined the benefit of the exercise on an academic, practical and social level (Figure 3). On a scale of 0 to 10, students were asked their opinion of the usefulness of the project towards certain areas, with 0 being not very good and 10 being very good. Students were asked how good was the exercise as regards getting to know their course, getting to know their city, getting to know their classmates and becoming familiar with academic life.

Average responses were uniformly very high across the group, ranging from 8.2 to 9.4. In each area responses tended to be somewhat lower for the GEO students. While the average responses were still good (between 7 and 8.6) from this group, the difference in perception may be something worth investigating in a focus or tutorial group situation at a later stage.

Section 3 of the survey examined a wider array of issues, querying students' attitudes to specific issues such as site locations, their own course, sister courses and the School itself (Figure 4). Again, responses were quite positive overall with few perceptible differences, if any, between the two groups.

Two thirds of students said the project was enjoyable and worked well as an induction exercise. Only 5% of students disagreed that they would have a better understanding of what they will do at the School of Spatial Planning as a result of the project. The majority of students said they gained an interest and understanding of fellow courses at the School of Spatial Planning and that the exercise helped them confirm their choice of course.

The exercise also seems to have been helpful to students in confirming their choice of course. Over the duration of the year a small number of registered students (less than 10%) opted out of the course. These numbers are normal and such attrition is expected with every first year group. Separately, these students completed deregistration forms which included reasons for opting out. Some students gained late acceptance onto preferred courses. Others gave loose and somewhat benign comments.
like “course was not for me” or “not my kind of thing”. While it is difficult to interpret much from such
generality, and the induction course itself was never referred to by deregistered students, it seems
reasonable to assume that their choice can only have been assisted by the Induction Project. In fact,
the experience may have facilitated an early and clearer decision which would be a benefit to the
student, the School administration and the recipient course administration.

The only matter which did not receive a perceptively positive response was site access where there
was a balanced view among students. This also arose during the open question section, which is
discussed below. Most positively, though, when asked if they would recommend the induction
assignment project to one of next year’s first years, no students disagreed with the statement, with the
majority of students agreeing or strongly agreeing.

Figure 4: Responses to Student Questionnaire Section 3

Section four of the survey was an open question and asked students for reflections or comments on
the project (Figure 5), for example, whether it was a worthwhile experience and / or what could be
done to improve it for future years? The students used the opportunity to raise some specific technical
issues, for example, a data loss incident that occurred.
The practical matter of accessing the sites was raised by a number of students. It was acknowledged that out of necessity the sites were distributed over a very wide area. Each corridor was also, by its nature, very long and difficult to cover by public transport. This was largely unavoidable at the time since the project concerned power pylon corridors, which was considered to be a relatively straightforward issue for students to deal with at such an early stage. However, it may be a consideration for future exercises to select an alternate type of corridor or infrastructural entity, which may be easier for students to access.

These issues aside, most comments praised the exercise as an enjoyable and worthwhile experience. While some students certainly felt challenged by the exercise this may not necessarily need to be interpreted as a negative factor, especially in view of the quality of the eventual output from the students.

![Figure 5: Responses to Student Questionnaire Section 4 – Open comments](image)

### 5 Conclusions

In this paper we have presented the results of an induction project where students were challenged with a real-world problem which could only be solved through operating as an interdisciplinary team of related professionals. With regards improving the first year experience, we feel that we have introduced a mechanism by which students can gain a valuable insight into the career of graduates of the three programmes at the earliest possible opportunity. While for some students this insight may serve to confirm their programme choice, for others the result may be the opposite, but in both cases the outcome is positive for the student.

The results of the project, from both a staff and student perspective, were very encouraging and through the utilisation of a feedback and evaluation loop it is hoped that an improved project can be provided for the cohorts for the School of Spatial Planning, DIT in September 2009.

### References


