

# **Efforts in Outreach Programmes to Inform Secondary Students on Studying ICT at Third Level**

## **Providing a Realistic Experience in Coursework and Accredited Assessment**

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## Abstract

The Irish national secondary school curriculum has no dedicated Computer Science or Information and Communications Technology (ICT) provision (Stokes, 2010). In addition the academic study of ICT programmes is often misunderstood by prospective students with little real-world or practical insight into these fields (Tangney, et al., 2009). As such, there have been several efforts to introduce secondary school students to elements of third-level experience before actually attending third-level full-time, normally taking the format of summer camps or similar outreach programmes at third-level institutions (see Appendices I & II). However it could be argued that some of these programmes add to the misunderstanding. A primary reason for this is many of these programmes focus on *explaining* the ICT curricula and giving limited *examples* of such in the form of past student projects, demonstrations, and other eye-catching and interest-generating presentations or activities – often referred to as ‘show’ (Frieze, 2005). Though the message is sound, the impression of studying at third-level received by potential students may not be. The reality is that these programmes involve *coursework* and *accredited assessment*. Starting in summer 2012 and expanding in 2013, the College of Computer Training<sup>3</sup> has delivered a programme called *ICT Taster Courses*, in partnership with Microsoft Ireland and Fasttrack to IT (FIT) as part of the Youth2Work initiative (Fasttrack to IT, 2013). The programme consists of intensive, three-week courses, each focussing on a particular ICT core skill area. These programmes were provided free of charge to senior-cycle secondary school students. Unlike any programme previously offered in Ireland, students undertake actual coursework and importantly, accredited assessment. Successful completion of the programme can result in two awards – a nationally accredited FETAC level 5 component certificate and an industry accredited Microsoft Technical Associate (MTA) certification.

In addition to presenting student expectations, experience and results, this paper presents institutional successes and lessons learned. We outline the results of surveys designed to determine the depth of understanding of ICT when students arrive and the degree to which this understanding is improved as programmes progress. We also investigate how this experience influences future choice on studying ICT at third-level. This is of obvious interest to students, parents, school teachers and counsellors, third-level ICT educators, professionals, and policymakers.

## Keywords

ICT Education, Taster Courses, Summer Camps, Third-level College Outreach

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## 1. Introduction

It is widely agreed that there is a significant discrepancy between the perceptions of ICT held by potential students and the reality of actually studying it (Tangney, et al., 2009). The lack of ICT in the Irish second level curriculum certainly does nothing to help this. Efforts to inform the perception of potential students (namely secondary school students) tend to take one of two broad forms: *generating interest* and *providing experience*. Methods falling under the generating interest category include demonstration days, short summer camps, hands-on activities, and even evangelical advocacy sessions actively countering popularly held (and often misguided) stereotypes and beliefs (Frieze, 2005). Providing experience tends to be narrower in scope, normally in delivering formal modules to second level students within or in addition to their existing curriculum (Collofello, et al., 2003), (Caraway, 2011). It has been argued that a mixture of both approaches is needed, and substantial work has produced results based on this approach (Tangney, et al., 2009). Nonetheless the fact remains in ICT, just as it does for most university/college level courses – studying at third level invariably entails coursework and accredited assessment.

This paper presents the results of and experience gained in delivering a programme called ICT Taster Courses, at the College of Computer Training, in partnership with Microsoft and Fasttrack to IT as part of the Youth2Work initiative. The programme consists of five intensive, three-week long courses, each focussing on a particular ICT core skill area. These programmes were provided free of charge to approximately 75 senior-cycle secondary school students in 2013. Unlike any programme previously offered in Ireland, students undertake actual coursework and importantly, accredited assessment. Successful completion of the programme can result in two awards – a nationally accredited FETAC level 5 component certificate and an industry accredited Microsoft Technical Associate (MTA) certification. The chief goal of this paper is to convey the experience of secondary students undertaking third-level coursework and assessment including their quantitative results and qualitative perceptions on ICT resulting from their study.

The rest of this paper is organised as follows: Section 2 provides an overview of ICT curricula at second-level in Ireland. Section 3 looks at previous and existing outreach programmes both domestically and internationally. Section 4 presents the ICT Taster Courses at the College of Computer Training, previous study by students, student results, and the results of surveys showing: the importance of accreditation, the effects on perceived skill level, the impact on attitudes towards third-level study, and the student experience in general. Section 5 gives concluding remarks and considerations for future study.

## 2. Irish ICT curricula at second-level

From an Irish perspective, it must be highlighted that although major developments have taken place in terms of providing ICT for teaching purposes in schools, the country is still without a grounded curriculum for ICT. The primary focus to date has been providing the tools and technologies to enable instruction through the use of ICT in schools but not to add ICT to the skills being taught and learned, even though the government recognises its importance to the growing knowledge economy (Department of Education and Science, 2008). At secondary level, computers were first introduced as a course of study to the curriculum in 1980, when an optional computer studies module was included in the Leaving Certificate Mathematics syllabus. Schools are required to develop their own syllabus for this option within broad parameters laid down by the Department of Education and Science (Department of Education and Skills, 2006). The module is not examinable, but students who complete it satisfactorily are issued with a certificate by the Department. In 1985 a computer studies course was introduced in the junior cycle. Unlike the senior-cycle module, no certification is provided for those who complete this course. Neither of the computer studies courses has been revised since their introduction, nor has there been any further development of computer studies courses, as part of the curriculum in either the junior or senior cycles.

No less than 13 years later the National Centre for Technology in Education (NCTE) was established, with a brief to implement the *Schools IT 2000* initiative. The brief also included the development of ICT policy proposals and the provision of ICT policy advice to the Department of Education and Science (Department of Education and Science Inspectorate, 2008). The initiatives were focused on integrating ICT into the school infrastructure and not concerned with curriculum development. In 2001 the Government launched its second policy document on ICT in education, *A Blueprint for the Future of ICT in Irish Education*. This formed a three-year strategic plan designed to support the continuation of the main initiatives begun under IT 2000 and still lacked a focus on the development of a curriculum (Department of Education and Science, 2001). ICT curriculum development is clearly not on the agenda in either of these initiatives and the onus is on the schools to integrate technology into their teaching practice which therefore creates inconsistencies in its use and purpose.

Following on from this a study was performed by the National Council for Curriculum and Assessment (NCCA) in which they commissioned two research reports in the area of ICT at post-primary level in 2000 and 2001. The first study found that there was overwhelming support from both the education system and industry for the introduction of a computer-based subject to the established Leaving

Certificate programme (O'Doherty, et al., 2000). The primary reason put forward by respondents for introducing such was the promotion of computer literacy. The second study investigated the preferred nature of an ICT-related subject in more depth (O'Doherty, et al., 2001). This reported general agreement on the need to introduce provision for 'computer literacy' for all students as the first priority. However, there was no agreement on how this could be best achieved.

For the period 2007-13, the Irish government set aside an ICT budget of €337 million for equipping primary and secondary schools throughout Ireland (Department of Education and Science, 2008) and while this is clearly a proactive step for ICT integration, it still falls short of the development of a much needed curriculum. In the *Investing Effectively in Information and Communications Technology in Schools Report*, Mary Hanafin, then minister for Education and Science states 'we need to foster conditions and provide supports which will allow best practice in the use of ICT to flourish and spread' (Department of Education and Science, 2008). The government produced report also highlights the importance of creating and fostering an ICT-literate, creative and entrepreneurial workforce that can use ICT confidently for invention, problem-solving and knowledge creation. In addition the report suggests that ICT enlivens learning in STEM subjects which in-turn can contribute to increased participation in these disciplines at third level (Department of Education and Science, 2008). This creates an assumption, as opposed to a development path, to encourage students to follow ICT to third level. Furthermore it focuses on the *use* of ICT, not a working, *knowledge* of ICT or ICT development.

For comparison purposes it is important to look at developments in the United Kingdom. Since the Education Reform Act of 1988, ICT has been compulsory for all pupils aged 5 to 16 in maintained schools (The Office for Standards in Education, Children's Services and Skills (UK), 2011). The UK Department of Education has recently released its latest national curriculum framework document, and ICT appears to feature highly on the agenda for 2014. Developments include five to seven year-olds being taught the concepts of algorithms, followed by creating and debugging simple computer programs. Seven to eleven year-olds will be coding programs to accomplish specific goals and pupils aged eleven and up will be expected to build on their abilities by using two or more programming languages to solve a variety of computational problems (Gothard, 2013). It is important to note however, that this new direction is not without its critics (Marshall, 2013).

The UK approach to ICT curriculum is in stark contrast to what is happening within the Irish landscape. In the absence of any formal ICT curriculum at the secondary level, new industry-led computer science initiatives are now springing up around the country to encourage students to consider a career path in ICT and computer science.

The most recent development sees Google providing Trinity College Dublin with a €1.5 million donation to develop a new project aimed at transforming computer science in Irish schools (MKC Communications Press Releases, 2013). There are also ‘grass-roots’ efforts filling this void, such as approximately 100 CoderDojo groups active in Ireland, led by parents, off-duty educators, and students alike, and supported in some cases by industry such as Microsoft and IBM, and third-level institutions such as IADT and the Science Gallery at Trinity (Coder Dojo, 2013). Since the first discussion of an ICT based curriculum in 1999, 14 years on, these non-governmental initiatives may finally convince the government of the urgency of an ICT based curriculum.

### **3. ICT outreach programme trends in Ireland and abroad**

Research into programmes similar to *ICT Taster Courses* in other third-level institutions in Ireland has revealed a range of programmes created to engage second level students in ICT courses (Appendix I). However, the duration and descriptions of many of these courses bring into question the depth of detail that these courses go into and the level of assessment that is carried out. In many cases this appears to be quite low and the primary focus seems to be on activities that generate interest – referred to as ‘show’ by Frieze (2005) – compared to providing insight and experience in studying ICT at third-level. To the best of the authors’ knowledge there has been no Irish programme before which focusses on coursework and accredited assessment. The most similar was a programme at UCD which offered UCD credit for a module offered over the summer period to secondary school students (Caraway, 2011). Many institutions have taken the Open Day approach, showcasing third year student projects, conducting tours of facilities and providing face-to-face time with current/past students. Such initiatives may be worthwhile from an awareness perspective but whether or not they adequately represent the academic rigours which prospective students will face is not clear. A small number of institutions have run more comprehensive programmes with regular weekly sessions (UCC - Munster Programming Training) or one week of tutorials across a variety of disciplines (NCI - Discover University) but even on these programmes the element of assessment does not appear to be linked to any recognised awards body or standards framework.

In the UK the approach has been much the same with most institutions adopting a strategy of open days rather than serious coursework and assessment (Appendix II). The larger number of and diversity in UK institutions naturally results in the same for outreach programmes. One notable trend in the UK that could be considered in Ireland is different institutions sharing each other’s programmes or co-offering

programmes, such as the University of London's University Taster Course Programme (University of London, 2013).

In the United States a move toward online courses and in particular massive open online courses (MOOCs) is gaining momentum and is now backed by some of the largest Educational Institutions in the country – MIT, Stanford and Harvard to name but a few. While these courses give access to material and assessment samples they do not provide a full in-class experience, direct access to lecturing staff or formally recognised qualifications.

#### 4. ICT Taster Courses at CCT

Starting with a pilot project in 2012 and expanding in 2013, The College of Computer Training has delivered a programme called ICT Taster Courses, in partnership with Microsoft and Fasttrack to IT as part of the Youth2Work initiative. In 2013 the programme consisted of five intensive, three-week courses, each focussing on a particular ICT core skill area. These programmes were provided free of charge to approximately 75 senior-cycle secondary school students. Unlike any programme previously offered in Ireland, students undertook actual coursework and assessment. This programme was offered free of charge, funded by CCT, Microsoft and FIT.

##### 4.1 Assessment and awards

Successful completion of the programme resulted in two awards – a nationally accredited FETAC level 5 component certificate and an industry accredited Microsoft Technical Associate (MTA) certification. As there does not exist a suitable Level 5 FETAC component certificate in Mobile Development there was no FETAC accreditation for this module. Table 1 shows a summary of 2013 ICT Taster Courses assessments and student numbers.

Programme	Certificate	Attempted	Successful
Programming	MTA Software Dev. Fundamentals	16	4
	FETAC L5 Computer Programming	20	19
Web Dev	MTA Web Dev. Fundamentals	4	1
	FETAC L5 Web Authoring	5	5
Mobile Dev	MTA Mobile Dev. Fundamentals	5	1
	FETAC N/A	N/A	N/A
Networking	MTA Networking Fundamentals	7	1
	FETAC L5 Networking Essentials	9	9
Gaming	MTA Gaming Dev. Fundamentals	12	1
	FETAC L5 Games Studies	16	13

**Table 1: Summary of awards achieved for 2013 ICT Taster Courses.**

Overall the FETAC pass rate was 93%. The MTA pass rate was 18%. The MTA is a new certification and global pass rates are not known, but for comparison the pass rate of 20 students who had completed and passed (without repeating any exams) a two-year, 120 ECTS HETAC level 6 Higher Certificate in IT at our institution had a pass rate of 45%. We view achieving close to half of this pass rate in a three week level 5 programme with 3 weeks of study (compared to two years at level 6) as acceptable.

#### 4.2 Survey results

Students were given induction surveys on the first day of the course, and course completion surveys near the final day. The surveys were designed to measure the importance and impact of coursework and assessment on the attitude of students towards their own knowledge, experience, and further study of ICT, in particular their intention of third-level study in ICT. The surveys also measured the competency level of the students, as perceived by themselves on entry and exit from their programmes. Of respondents to the induction survey, 24 had studied ICT in some form through secondary schooling prior to participating in the programme. Two had studied at third-level institutions and one had undertaken self-study. Table 2 summarises these efforts.

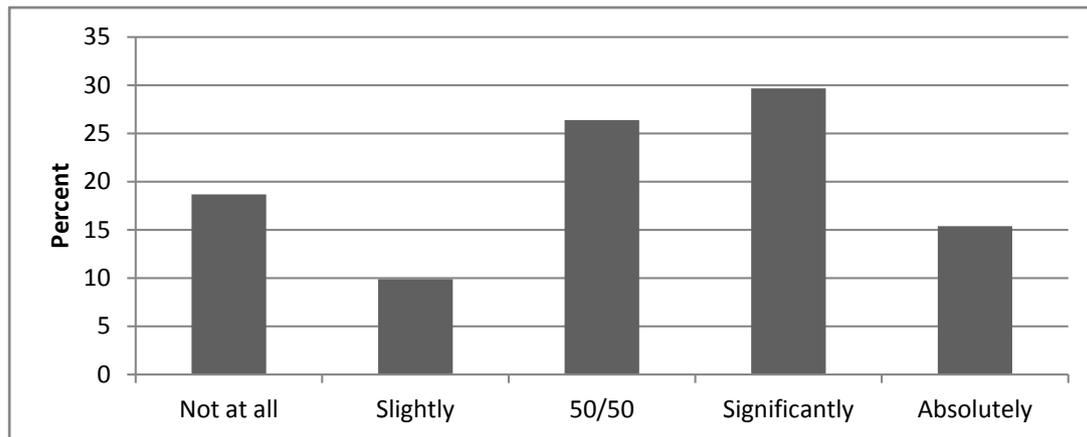
<i>n</i>	Form of training	Level
1	Self-study	N/A
9	European Computer Driving License (ECDL)	2 <sup>nd</sup>
5	Microsoft Office	
2	Web Dev	
2	Programming (Scratch, Java, VB)	
2	Unspecified	
1	After school programme	
1	Transition year (not @ third level institution)	
1	GCSE	
1	Online	
1	1 week @ DIT	
1	CTYI @ DCU	

**Table 2: Summary of students' prior ICT training. *n*: number of students.**

The ad-hoc nature of the training that incoming students had is reflective of the fact that there is no structured ICT curriculum at secondary level. The largest group having common prior training were nine students that studied the ECDL curriculum. This is worrying, as Science Foundation Ireland has stated that while the ECDL is a worthwhile programme, it focuses on computer literacy rather than computing itself, and there is a general sense that there should be a move away from application usage in secondary schools towards application development (Joint Committee on Jobs, Enterprise and Innovation, 2012). The five students that studied MS Office would also fall into the category of computer literacy.

### 4.3 Importance of accreditation

To gauge incoming students' attitudes towards programme accreditation, they were asked at induction: *How important is some sort of accreditation to you in attending a summer course?* On a scale of 1 representing 'not at all' and 5 representing 'absolutely', the overall response was 3.70, indicating that the majority of students felt that accreditation was 'significantly important'. Figure 1 shows the responses by category.



**Figure 1:** *How important is some sort of accreditation to you in attending a summer course?*

To determine if there was a difference between the industry-standard, internationally accepted accreditation of the Microsoft Technical Associate award and the Irish government ECTS-based FETAC award, at induction students were asked: *On a scale of 1 being 'not at all' and 5 being 'absolutely'*,

- *How important was the fact that you can earn an MTA (Microsoft Technical Associate) award in influencing your decision to choose this programme?*
- *How important was the fact that you can earn a FETAC accredited Level 5 award in influencing your decision to choose this programme?*

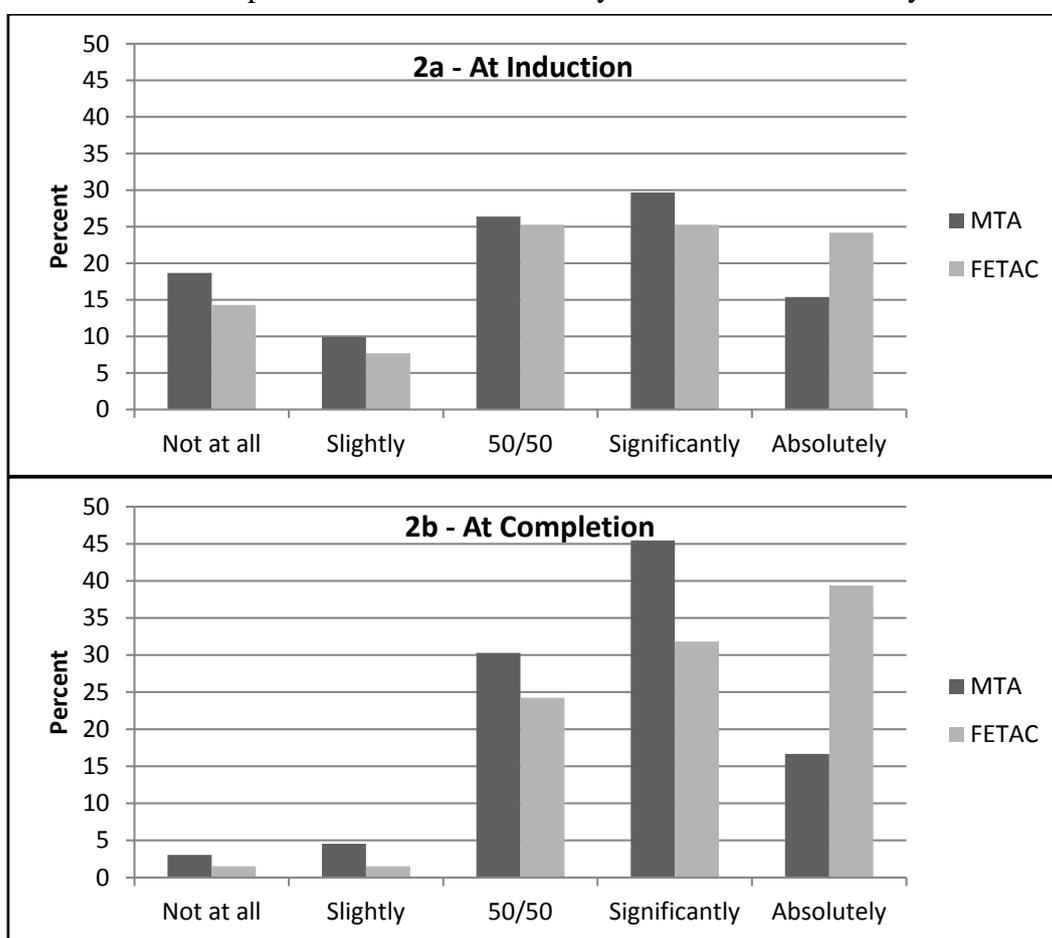
Overall the scores were: MTA (3.13) and FETAC (3.39). To determine if attitudes towards accreditation had changed during the course delivery, at completion students were asked:

*On a scale of 1 being 'not at all' and 5 being 'absolutely'*,

- *How important is earning your Microsoft MTA to you?*
- *How important is earning your FETAC Level 5 Certificate to you?*

The mean responses were: MTA (3.68) and FETAC (4.08). Figure 2 shows responses for the previous two question pairs. As the question pairs are not identical the results are to be interpreted qualitatively. This is evidence of a notable shift in the importance of assessment/accreditation in students' minds during programme delivery. Also

worthy of discussion is the relationship between MTA and FETAC opinions. Where there is 50/50 or better importance in assessment and accreditation (A&A), the importance of MTA outweighs that of FETAC by an average margin of 6.3% for ‘50/50’ and ‘significant’ importance. However, amongst students who rank the importance of A&A as *absolute*, FETAC outweighs MTA by a margin of 8.8%. One possibility for this is the FETAC components being formative and cumulative in nature (FETAC certificates normally involve multiple formative assessments and a terminal summative exam). In contrast, the MTA components are purely summative (terminal exam only). It is possible that for students that put A&A importance as absolute put more importance on or are more comfortable with, cumulative and formative A&A compared to summative. Clearly more work is necessary in this area.



**Figure 2a: At Induction:** *On a scale of 1 ‘not at all’ and 5 ‘absolutely’ – How important was the fact that you can earn an MTA (Microsoft Technical Associate) award in influencing your decision to choose this programme? How important was the fact that you can earn a FETAC accredited Level 5 award in influencing your decision to choose this programme?*

**Figure 2b: At Completion:** *On a scale of 1 ‘not at all’ and 5 ‘absolutely’ – How important is earning your Microsoft MTA to you? How important is earning your FETAC Level 5 Certificate to you?*

#### 4.4 Effects on perceived skill level

To gauge the students' perception of their own ICT skill level, all incoming students were asked the following question at induction: *How would you rank your current level of understanding in ICT (Information and Communications Technology) and/or CS (Computer Science)?* Upon completion of the courses, students were asked the exact same question. Figure 3 displays the results by category, showing that all skill levels below 'average' fell dramatically. In fact the percentage of students who considered their CS/ICT skills to be 'none' (10%) or 'very little' (19%) went to 0%. The percentage of those at 'basic' level also fell from 22% to 9%. All skill levels at or above 'average' increased. 'Average' rose from 12% to 17%, 'good' from 21% to 35%, and 'very good' showing the largest rise (a factor of nearly three) from 13% to 35%. Those at 'expert' level also rose from 3% to 5%. The mean skill level rose with statistical significance, from 3.68 ( $\sigma = 1.68$ ) to 5.09 ( $\sigma = 1.02$ ), ( $t = 6.49$ ,  $p < .001$ ).

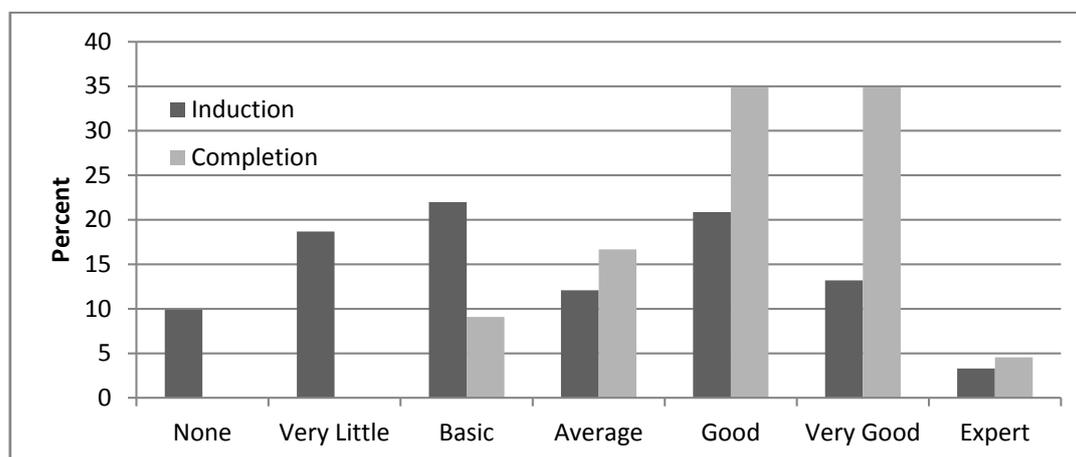
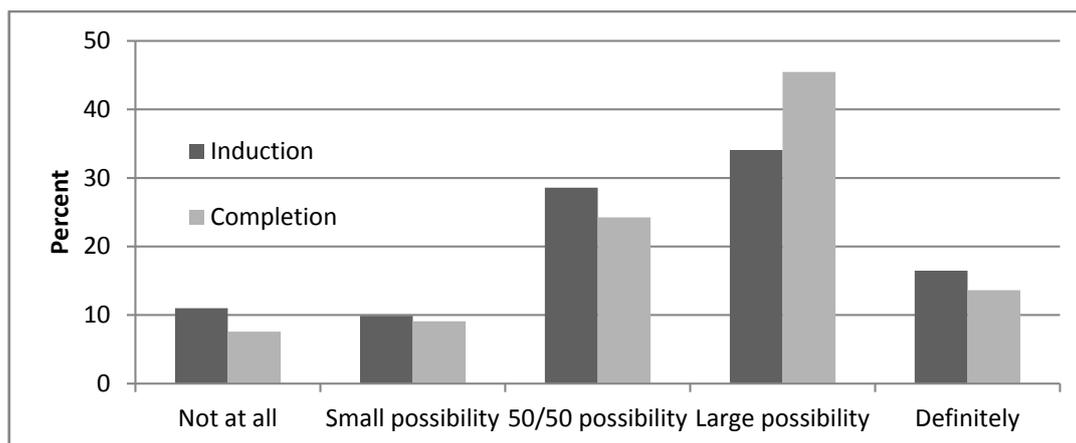


Figure 3: *How would you rank your current level of understanding in ICT and/or CS?*

#### 4.5 Impact on attitudes towards third-level study

To determine the impact of these courses on future student study intentions, all students were asked to respond to the following statement both at induction and completion: *"I am considering studying for a degree in ICT (Information and Communications Technology) and/or CS (Computer Science) at third level."*, on a range from 1 'not at all' to 5 'definitely'. Figure 4 shows results by category. The only category to increase was 'large possibility'. Thus the effect on intention to study CS/ICT at third-level that students experienced seems to be an overall migration from *all* categories to 'large possibility'. On average, 11.38% of students left another category to join the 'large possibility' category. The increase in mean was not statistically significant from induction (mean = 3.35,  $\sigma = 1.19$ ) to completion (mean = 3.48,  $\sigma = 1.07$ ),  $t = .69$ ,  $p = 0.245$ .

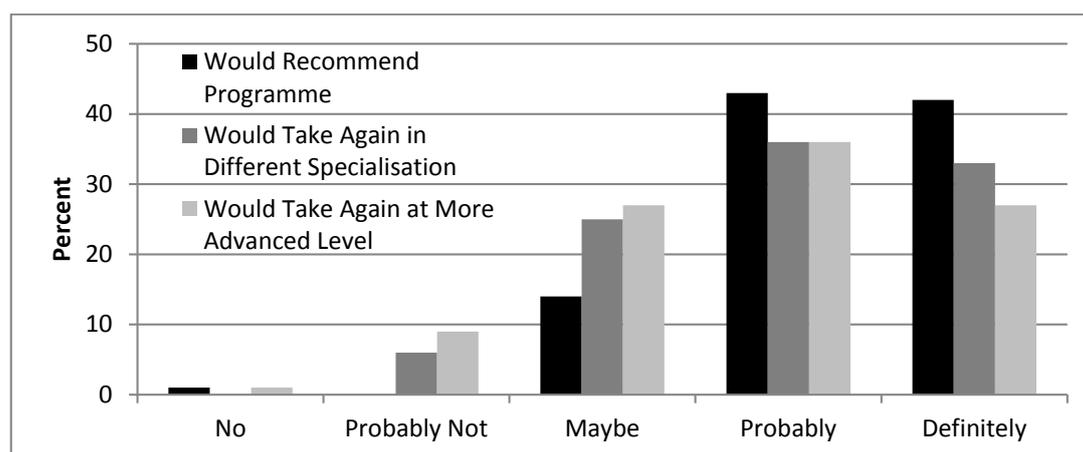


**Figure 4:** *I am considering studying for a degree in ICT (Information and Communications Technology) and/or CS (Computer Science) at third level.*

A paired *t*-test (from a subset of  $n = 36$  learners), using volunteered identifying information, showed similar results ([induction] mean = 3.57,  $\sigma = 1.15$ ; [completion] mean = 3.65,  $\sigma = 1.05$ ),  $t(35) = 0.62$ ,  $p = 0.269$ . However, for individual students in the paired samples there were notable changes in some instances, with one student moving from ‘small possibility’ to ‘definite’ and another from ‘definite’ to ‘50/50 possibility’. It is noted that any change in intention (pro-ICT or not) should be considered a good, as a signal that students are making more informed choices.

#### 4.6 Student experience and feedback

Figure 5 shows the results of three questions asked in the course completion survey designed to reflect their general feelings on their experience on the programme.



**Figure 5:** *I would recommend this programme to a friend, classmate, sibling, etc.; I would attend a similar course again in a different specialisation; I would take this course again at a more advanced level.*

Students were asked to rank their answer to the statement: *I would recommend this programme to a friend, classmate, sibling, etc.* the responses were extremely positive, at 42% ‘definitely’, 43% ‘probably’, 13% ‘maybe’, 0% ‘probably not’ and 1% ‘no’.

Results were similar when asked to respond to the statement: *I would do a similar course in a different subject at CCT again*, with 33% responding ‘definitely’, 36% ‘probably’, and 25% ‘maybe’. Only 6% replied ‘probably not’ and 0% replied ‘no’. Finally, students were asked: *I would do another similar course at CCT again, in the same/similar subject, but at a more advanced level*. Results were almost identical to the previous question, showing that students thought their experience to be positive and worthwhile, but that they are also eager to advance their study in a similar manner.

## **5. Conclusion and considerations for the future**

This paper described a Computer Science/ICT outreach programme for secondary students. Each student participated in a three-week third-level module involving coursework and assessment. Students were provided with the opportunity to attain a Level 5 FETAC component certificate and a Microsoft Technical Associate certification. This programme was designed to give students a realistic taste of studying ICT at the third-level, particularly due to the lack of ICT in the Irish second-level curriculum – which survey results clearly showed, with less than ½ of students having any exposure to ICT curricula prior to the programme, and most of these being trained in the use of ICT rather than being exposed to any curricula in ICT itself.

The primary sources of feedback were student assessment results and the outcome of two surveys – one given at induction and another at programme completion. Student achievement was more than satisfactory with almost all achieving the FETAC certificate and an acceptable number achieving the MTA certification. Nonetheless, one consideration for the future is trying to raise MTA success rates. Surveys also showed that most students deem accreditation in an outreach programme to be ‘significantly important’, that students’ perceived skill levels increased dramatically as a result of participation in the programme, and that participating in the programme did affect students’ decisions on studying ICT at the third level, particularly at the level of some individual students, if not as a group as a whole.

Perhaps the most important result of this paper is that the experience gained by the students is having an impact on their *perception* of studying ICT at third-level. Whether or not these students actually go on to do so will be the subject of further research. We have a system in place to track graduates of this programme as they enter third-level. The ICT Taster Courses programme is scheduled for expansion in 2014 and this study is considered to be on-going.

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## Appendix I - Taster and Outreach Programmes in Third-Level Irish Institutions

Name of Institution	Format of Course/Experience
Athlone Institute of Technology	Open Day
Cork Institute of Technology	Mentioned, no details.
Dundalk Institute of Technology	Taster day for Science
Galway-Mayo Institute of Technology	Open Day, Computer Science: 30 minute session only
Institute of Art, Design and Technology	CS4HS <sup>†</sup>
Institute of Technology, Blanchardstown	ITB Taster (Taste And See That Education Rewards), two days.
Letterkenny Institute of Technology	One day, one hour sessions
Limerick Institute of Technology	LIT Aspirations - Faculty visits to schools
Waterford Institute of Technology	Taster Sessions, no details
College of Computer Training	Taster Courses 3 week duration including lectures and assessment
Griffith College	Workshops for students, three sessions, each an hour and a half long
National College of Ireland	Discover University, week long mix of academic taster programmes covering Business, Marketing, HR, Computing and Digital Media
University College Dublin	Shadowing Scheme, one day on campus in the company of a first year student; 2009/2010 Introduction to Computer Science and Programming (ICSP) module for second level students; One day workshop in UCD School of Computer Science and Informatics for 12 weeks; Take 5 <sup>*</sup> ; CS4HS <sup>†</sup>
NUI Galway	CS and IT Experience, one day; Computing Summer Camp, 1 week pre-JC, 1 week post-JC, CS4HS <sup>†</sup>
University College Cork	Summer Camp, 1 week (1 day CS); "Munster Programming Training" offers special training in computer programming as preparation for participation in the "All Irish Schools Programming Competition" over 20 weeks; One week TY programmes usually in Nov, Feb and Apr.
Trinity College Dublin	Bridge 21, one week course exploring new learning approaches; Take 5 <sup>*</sup> ; CS4HS <sup>†</sup>
Dublin City University	Take 5 <sup>*</sup> ; CTYI; Compute TY, 3 weeks
Dublin Institute of Technology	Open Days; Take 5 <sup>*</sup>
University College Limerick	Taster Days
National University of Ireland Maynooth	Summer Camp, one to three weeks/student; Take 5 <sup>*</sup>
University of Ulster	Discovery Day

\* Take 5 is an initiative for Secondary Schools students to spend 1 day at each of the participating Institutions to get a flavour of College life. There is no specific Computer Science objective and students attend classes for a variety of disciplines.

† CS4HS (Computer Science for High School) is an initiative sponsored by Google to promote Computer Science and Computational Thinking in high school and middle school curriculum. The

programme has changed over the first few years and how schools use funding and implement the programme varies.

The research for this appendix began with FETAC and HETAC accredited provider lists along with the Institutes of Technology and Universities. Then a search was performed using multiple search engines (Google, BING & Yahoo) and by searching each Institutions Web Site. The search criteria included terms such as “taster”, “secondary”, “sample”, and “outreach”. It also included browsing each site for links to schools and secondary schools programmes. This list is not assumed to be exhaustive.

## **Appendix II - Taster and Outreach Programmes in Third-Level UK Institutions**

<b>Name of Institution</b>	<b>Format of Course/Experience</b>
University of Aberdeen	Taster Day
University of Abertay Dundee	Taster Days
Aberystwyth University	Taster Days
Anglia Ruskin University	Sample classes, 1 day
Aston University	Participate in University College London Taster week
Bangor University	Taster week; school visits
University of Bedfordshire	Visits to schools
Birkbeck, University of London	Participate in University College London Taster week
University of Birmingham	Outreach for disadvantaged students
Birmingham City University	Taster weeks single classes
Bournemouth University	Taster day
University of Brighton	Taster week, multiple classes
University of Bristol	1 week web/programming no assessments
University of Cambridge	1 week course programming and robotics
Cardiff University	2 days taster sessions
University of Chester	1 day ‘Uni Sampler’
City University London	Participate in University College London Taster week
University of Dundee	2 day course over 4 weeks different students each week
University of East Anglia	1 week of classes in different disciplines - arts, science, computing
University of East London	Participate in University College London Taster week
The University of Edinburgh	3 weeks of taster classes
University of Exeter	Week of classes for groups of 20 from local schools
University of Glasgow	4 week summer programming school, no detail
Goldsmiths, University of London	Participate in University College London Taster week
University of Hertfordshire	Subject conferences with 1 hour mini lectures
University of Huddersfield	Sample classes, 1 day
Imperial College London	Participate in University College London Taster week

The research for this appendix was performed using search engines (Google, BING & Yahoo) and by searching a sample of 50 UK registered Institutions Web Sites. The search criteria included terms such as “taster”, “secondary”, “sample”, and “outreach” “Year 11” and “Year 12”. It also included browsing each site for links to schools and second-level UK schools programmes. Although not exhaustive, the list is representative of the breadth of outreach programmes on offer at UK institutions.