

Junior Cycle Coding in Action— a CPD initiative to support the introduction of the Junior Cycle short course Coding

Interim Report – February 2019

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An tSraith Shóisearach do Mhúinteoirí

Junior **CYCLE**
for teachers

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Acronyms and Abbreviations List

CAO	Central Applications Office
CBA	Classroom Based Assessment
CPD	Continuing Professional Development
CESI	Computers in Education Society of Ireland
CSO	Central Statistics Office Ireland
DES	Department of Education and Skills
EPE	Education and Public Engagement Programme (Lero)
Epi*STEM	The National Centre for Excellence in STEM Education
ETB	Education and Training Board
Forfás	The Irish national policy advisory board for enterprise, trade, science, technology and innovation
ICT	Information and Communication Technologies
IT	Information Technology
JC	Junior Cycle
JCT	Junior Cycle for Teachers
JCCiA	Junior Cycle Coding in Action
Lero	Irish software research centre
NCCA	National Council for Curriculum and Assessment
SFI	Science Foundation Ireland
STEM	Science, Technology, Engineering and Mathematics
SLAR	Subject Learning and Assessment Review meetings
UL	University of Limerick

Introduction to the Report

As the role of computers in our everyday lives is expanding, we will need to adapt and grow our skill set to be prepared for the challenges and advantages which these technologies present. It is becoming increasingly clear that education systems will have to equip young people with the skills that they will need to enter the changing world of work. According to the renowned scientist Stephen Hawking, “...whether you want to uncover the secrets of the universe, or you just want to pursue a career in the 21st century, basic computer programming is an essential skill to learn”¹. Over the past decade, great strides have been made to progress and update Ireland's Education system, all subjects at Junior Cycle have, or will experience challenges to their structure. A strong emphasis has been placed on students acquiring skills in Science, Technology, Engineering and Mathematics (STEM), with the publication of the STEM Education Policy Statement 2017-2026 and as part of this drive computer science is now being brought to the post-primary setting.

In the Irish government's *Action Plan for Education 2017*, one of the commitments made was to the acceleration of a digital agenda in schools; this was to be achieved through a Junior Cycle (JC) *Coding* short course and the introduction of the Leaving Certificate *Computer Science* subject². The *Junior Cycle Coding in Action* (JCCiA) initiative was designed to support schools and teachers in their introduction of the JC short course in *Coding*. Students and teachers were asked to engage with innovative coding-related resources, develop their expertise and to share their experiences³. JCCiA aimed to capture the experiences of teachers and students to assist with the further development of resources to support the teaching, learning, and assessment of the JC short course in *Coding*.

In September of 2018, a researcher was appointed through Lero and Science Foundation Ireland (SFI) to the Epi*stem Centre at the University of Limerick (UL). This researcher was given the task of documenting the experience of the schools enrolled in the programme. The researcher began by analysing the data which was gathered during year one of the JCCiA initiative and producing this report. It was hoped that the information which had previously been collected, would be used to inform and develop the programme moving forward.

The JCCiA programme followed on from the JC *Exploring Coding* initiative. At the end of the *Exploring Coding* initiative, a final report, titled '*Junior Cycle Coding in Action– a CPD initiative to support the introduction of the Junior Cycle short course Coding*'¹ was produced by Clare McInerney of Lero, and Michael Carey of the Junior Cycle for Teachers (JCT)⁴. This collaborative report outlined in detail the successes and challenges of the initiative along with recommendations for the next iteration of the project. This paper

¹ *Leaders and trend-setters all agree on one thing*. [online] Available at: <https://code.org/quotes>

² *Action Plan for Education 2017*, p.81. Available at: <https://www.education.ie/en/Publications/Corporate-Reports/Strategy-Statement/Action-Plan-for-Education-2017.pdf>

³ *Junior Cycle Coding in Action: Coding Brochure*, p.2. Available at: <https://www.jct.ie/perch/resources/shortcourses/coding-brochure-web-120317.pdf>

⁴ *Exploring Coding*, p. 2-3. Available at: <https://www.jct.ie/perch/resources/shortcourses/interim-report-exploring-coding-181016.pdf>

has used the *Exploring Coding* final report as a starting point and guide throughout its development. It attempts to address the issues raised by the final report and to add to the existing body of data surrounding the JC short course in *Coding*.

The layout of this interim report is as follows:

- Section One: Background to JCCiA
- Section Two: Review and outline of the CPD events and school visits
- Section Three: Impact of CPD Activities, to include data analysis
- Section Four: Progress within schools during the project
- Section Five: Conclusions from year one of JCCiA
- Section Six: Recommendations

This interim report aims to examine the first year of the JCCiA programme and review the progress of JCCiA at this mid-way juncture. A final report will be produced once the JCCiA when it concludes in 2019.

Acknowledgement

The writers of this report would like to express their appreciation to the teachers and staff of the fifty schools who were involved in JCCiA. The willingness of all individuals who took part in JCCiA to actively engage in and participate during CPD events, as well as those who supported them in attending by give their time so generously, was very much appreciated. Also, thanks to the JCT team for their valuable and constructive input during the planning and development of this report and their continuous support for this research project.

A sincere thanks would like to be extended to the following organisations for providing equipment, time, and support to the schools and teachers involved in JCCiA:

- Apple
- Google
- Intel Ireland
- Microsoft

Section 1 Background to JCCiA

In 2014, the National Council for Curriculum and Assessment (NCCA) developed nine short courses which schools could include in their JC programme. These short courses represented an innovative and optional curriculum component within the Framework for JC⁵. Students were required to complete one hundred hours of classroom engagement to receive full accreditation for the course⁶. Short courses are also a key feature of the Level 2 Learning Programme, and therefore it forms part of the JC pathway for students. The JC pathway for students gives students the opportunity to receive recognition and experience at Level 2 of the National Framework of Qualifications⁷.

Over the last decade, the Irish government, along with *Forfás*, the Irish national policy advisory board for enterprise, trade, science, technology and innovation, have highlighted the importance of developing skills in STEM. The Junior Cycle Framework was introduced in its present form in 2015. It included a variety of assessment methods, including Classroom Based Assessments (CBA) for the first time. A motivating factor for this was to meet the need from industry for graduates who possessed 21st-century knowledge and skills.

1. 1 Students in Computing and Technology

In Ireland, although some progress has been made in raising interest in STEM subjects at primary and post-primary level, a skills shortage in the labour market remains, particularly in the area of Information and Communication Technologies (ICT). On 6th May 2017, the Expert Group on Future Skills Needs, published its report *Vacancy Overview 2016* which found that 35% of all “...difficult to fill vacancies...” in October of 2016 were in the ICT sector and mainly for professional roles in computing and software development. Despite this, the number of students applying to computer science and software engineering courses at third-level has not increased to a proportion which reflects this differential. A statistic of concern is the decrease in applicants to Level 7/6 courses in ICT and Technology; over ten years a drop of 2.7% took place.

The CSO figures released following the 2018 CAO application, shows that these trends are continuing. In February of 2018, there were 72,643 applications made to the CAO. It is important to note that there was an overall reduction of 4% to the total number of applications to the CAO in 2018 when compared to the previous year. There was a 16% reduction in the numbers of these students listing an ICT course as their top preference for Level 8.⁸ The situation is more positive when it comes to ICT graduates as the below outlines there has been an increase in the number of graduates from ICT courses over the past four years⁹.

⁵A National Curriculum Framework for All 2012, p. 16. Available at: <https://education.gov.ie/en/Documents/A%20National%20Curriculum%20Framework%20for%20All%20-%202012.pdf>

⁶Junior Cycle Information on Short Courses, p. 1-2. Available at: www.jct.ie/perch/resources/publications/jc-short-courses-1.pdf

⁷ Junior Cycle for Teachers. Available at: https://www.jct.ie/l2lp/key_documents

⁸CAO.ie (2018) Available at: http://www2.cao.ie/app_stats/pdf/appstats01feb2018.pdf

⁹HEA.ie (2017) Available at: <http://hea.ie/assets/uploads/2018/12/HEA-Higher-Education-Fact-Sheet-ICT.pdf>

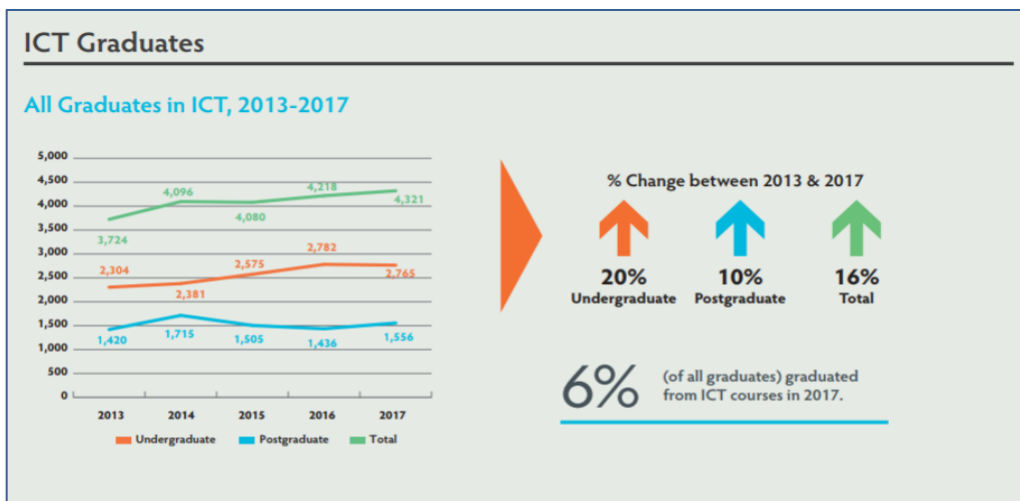


Figure 1 Graduates from ICT Courses

While these statistics are promising, computer science still has some of the lowest progression rates with 16% of all full-time undergraduate students not making it into their second year of study. From the research, it is clear that there is a misunderstanding of the nature of computer science¹⁰. This issue is undoubtedly multidimensional. However, this trend is one which the Department of Education and Skills (DES) is hoping to address by introduction of *Coding* at Junior Cycle and Computer Science as a Leaving Certificate subject¹¹. To address this and to encourage students to have a greater understanding of the opportunities and practicalities of studying computer science courses: Lero was commissioned to write the JC short course in *Coding*¹². The Short Course in *Coding* was a revolutionary step forward for Ireland's post-primary Education. The change meant that for the first time, computer science formerly appeared in Irish post-primary schools. The presence of computer sciences was also the first time that students could receive a formal introduction to, and acknowledgement of their achievement in, this area of learning.

1. 2 The JCT Short Course Team and Lero

The JCCiA initiative is a collaborative partnership between the JCT, a support service for schools and teachers, and Lero, the Irish software research centre. In 2013, the JCT was established to assist schools as they began implementing JC reforms. A team was established within the JCT dedicated to short courses; this team was tasked with the responsibility of supporting schools in the rollout of the short course in *Coding*.

Lero, brings together Ireland's leading software researchers, industry partners and experts in the area of computer science and software research in coordinated centres across Ireland. Since its foundation in

¹⁰ A Study of Progression in Irish Higher Education, p. 22. Available at: <http://hea.ie/assets/uploads/2017/06/A-STUDY-OF-PROGRESSION-IN-IRISH-HIGHER-EDUCATION.pdf>

¹¹ STEM in schools, p.4 Available at: https://data.oireachtas.ie/ie/oireachtas/libraryResearch/2017/2017-08-25_stem-in-schools-the-introduction-of-coding-and-computer-science-ict-to-the-curriculum_en.pdf

¹² Exploring Coding (2016) Available at: <https://www.jct.ie/perch/resources/shortcourses/interim-report-exploring-coding-181016.pdf>

2005, Lero through its Education and Public Engagement Programme (EPE) has actively engaged with learners in primary and post-primary schools. The EPE Programme aims to challenge, inform and effectively engage the public and stakeholders in the discipline of software research and computer science. The JCCiA initiative is directly aligned with Lero's Education and Outreach Public Engagement Programme.

This partnership began in 2014 when Lero was commissioned by the NCCA to write the specification for the JC Short Course in *Coding*. Lero then worked with the JCT on the pilot project of the JC *Exploring Coding* short course in collaboration with Intel Ireland.

1.3 The *Exploring Coding* initiative

The course specification was made available to schools in 2014 and revised further in 2016. In order to assist schools and teachers, a collaborative CPD initiative was established by the JCT, Lero and Intel Ireland. The first iteration was called *Exploring Coding*; it was set up with the aim of assisting and supporting teachers and schools across Ireland, who were seeking to implement the JC short course in *Coding*. Also, it was hoped that *Exploring Coding* would examine, document, and explore the implementation of the short course in *Coding*. As part of the *Exploring Coding* initial programme twenty-two, post-primary schools took their first tentative steps into JC *Coding*. The JCT and Lero allowed teachers to explore, engage, discuss, and gain an enhanced understanding of JC *Coding* through CPD days and school visits, under the umbrella of *Exploring Coding*. The *Exploring Coding* initiative ran for twelve months between January of 2016 and January of 2017. Once this programme came to an end, the JCCiA initiative was introduced to follow on from its predecessor and to develop on the recommendations which were generated from the *Exploring Coding* final report¹³.

1.4 Application Process for JCCiA

On the 12th of March 2017, a letter was sent from the Director of CPD for JC to the Principals of Irish post-primary schools, seeking their engagement and participation in the JCCiA initiative¹⁴. This initiative was designed to support schools who were committed to introducing the short course in *Coding* within their JC programme. There was an extensive application process with strict criteria for participation. The initiative was available to all schools. During the application process, schools were required to commit to the introduction of a new JC short course in *Coding*. Schools also needed to demonstrate:

- Sufficient timetable allocation to introduce the short course.
- Existing practice in terms of *Coding/Computer Science/ICT* at JC level.
- The presence of relevant teacher expertise in the learning area of *Coding*.
- That each school nominate two teachers to engage in the initiative¹⁵.

¹³ Exploring Coding Report

¹⁴ Appendix 1. Also Available at: <https://www.jct.ie/shortcourses/resources>

¹⁵ Junior Cycle Coding in Action: Coding Brochure. Available at: <https://www.jct.ie/perch/resources/shortcourses/coding-brochure-web-120317.pdf>

In order to apply, each school had to complete an online 'Expression of Interest' form and provide details of both teachers whom they were nominated to engage in the initiative. The relevant online form was available on the JCT website, and the closing date for expressions of interest was the 28th of April 2017¹⁶.

Post-primary schools seeking to engage with JCCiA were asked to participate in a two-year CPD programme. The nominated *Coding* teachers were expected to access and attend six core CPD days. Teachers also had the option of attending elective CPD events, contributing to online forums and sharing their experiences with the JCT short courses team. It was hoped that by following these guidelines, teachers and their schools would be the best equipped to successfully implement the JC short course in *Coding* in these schools.

1. 5 Key Observations from Applications of Interest to JCCiA

During the summer of 2017, the responses to the expression of interest forms were examined to ensure that the schools best equipped to take on the JCCiA initiative were selected. In total 196 schools registered an expression of interest, these schools transcended all divisions of gender, region and ethos. The diversity found within the applications of schools was an overwhelming success as well as a challenge to the JCCiA team who now faced the challenge of selecting suitable schools before the new school year commenced. Schools were selected for participation using the following criteria:

- schools that engaged with *Exploring Coding* or other *Coding* Events;
- schools that showcased existing practice;
- schools having teacher expertise in the area of *Coding* or Computer Science; and
- schools are currently providing curricular time at JC in this area of learning.

The response to the expression of interest form completed by schools was positive with many schools requesting further information and stating their intention to engage with the JCCiA initiative. This interest was reflected in the unprecedented level of applications submitted to JCCiA. In order to ensure the quality of the programme was maintained, participating schools were screened to ensure that their staff had the appropriate programming and, or, computing skills to be able to teach JC *Coding*, that the schools had a track record of engagement or interest in *Coding*/computer science, and that they were willing to commit to JCCiA.

The expression of interest process provided an overview of existing practices in Irish schools about *Coding*/computer science. Information was gathered which was used to consider which schools would be part of the JCCiA, which was a CPD programme to support the introduction of the short course in *Coding*. The data also provided a fascinating snapshot of the current landscape of *Coding* and computing in post-primary education. Of particular interest are:

1. Profile of nominated teachers
2. Existing practice about *Coding*/computer science
3. The schools' rationale for the development of *Coding* at the JC level.

¹⁶ <https://www.jct.ie/shortcourses/resources>

Profile of nominated teachers

The number of teachers enrolled in the programme did not exceed amounts which would compromise the integrity or success of the programme. CPD days would assist and equip teachers with information on the framework of the new course, pedagogical content knowledge, and strategies for the teaching, learning and assessment of the JC short course in *Coding*.

There was an almost even split between male and female teachers who were nominated to spearhead the JCCiA initiative within their schools, 44% of the teachers who were put forward as the *Coding* teacher within the school were female, while 55% were male. The teachers had a wide breadth of experience and knowledge and came from a variety of subject disciplines. Most teachers, almost 64% stated that they were already an ICT teacher within their school. The next most popular subjects were Materials Technology (which included Materials Technology (Wood), Metalwork, Technical Graphics and Technology) at almost 40% and Mathematics with 35%.

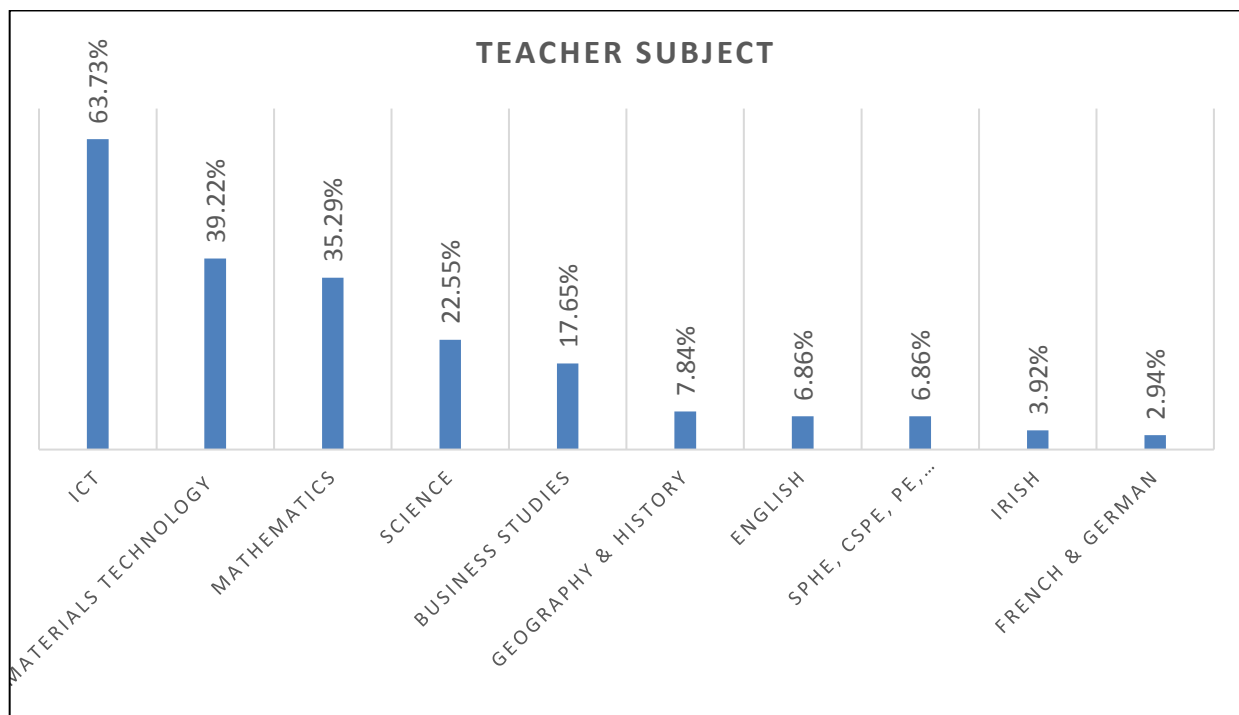


Figure 2 Teacher Subject selection

Existing practice about Coding/computer science

It was an arduous task which was conducted with the utmost care and without prejudice towards any particular type or location of the school. This diversity of applicants was reflected in the diversity of successful participants. The successful schools were a mixture of Community, Comprehensive, Secondary, and Education and Training Board (ETB) schools, from across the country.

Each of the schools selected was committed to offering the short course in *Coding* into their JC programme within the years ahead. While most of the schools (70%) had not been involved in the Exploring *Coding*

initiative, 30% of JCCiA had taken part in the *Exploring Coding* programme. As discovered by the information on teacher's subjects, 63% of teachers described themselves as an ICT teacher.

Student Timetable

The below graph indicates the number of classes, which schools were already allocating to the study of 'Computers' or 'ICT-related learning', before engaging with JCCiA in each year of their JC programme. As can be seen, most schools offered at least one class per week to their students in first and second year, however by third year there is a large proportion of schools who were not including 'Computers' or 'ICT related learning' as part of their timetable.

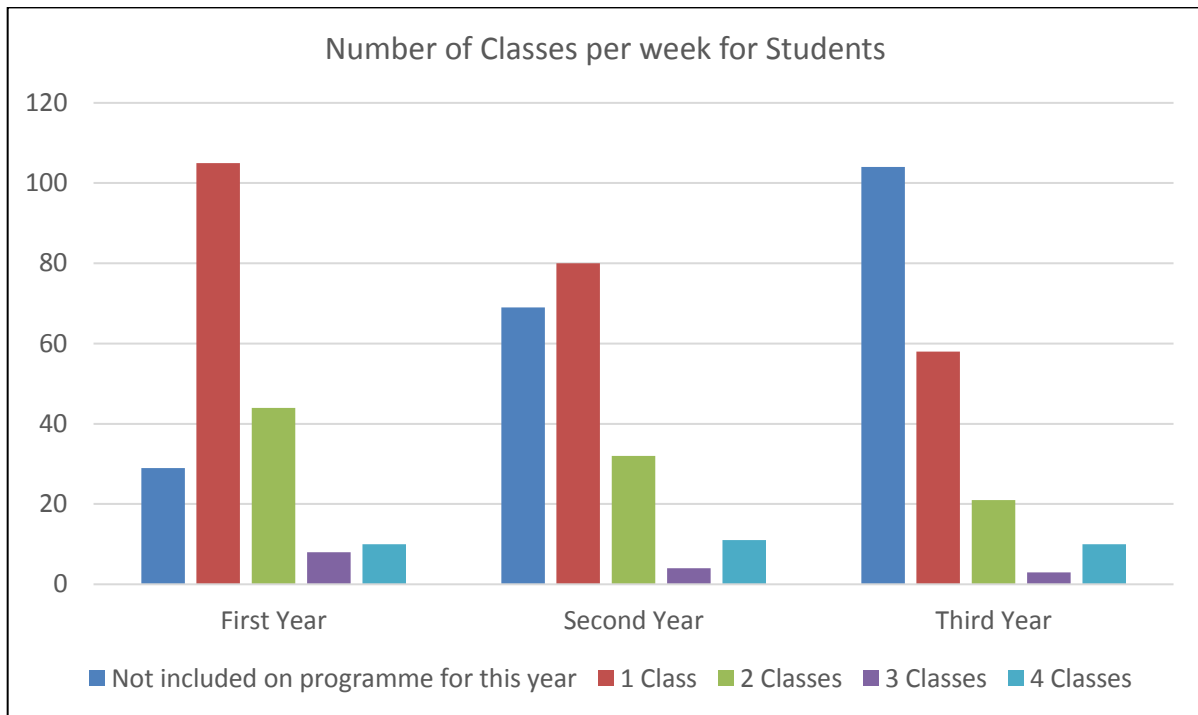


Figure 3 Number of Classes per week for Students

The schools' rationale for the development of Coding at the JC level

The schools who were successful in their endeavour to be part of the JCCiA initiative were from across the Republic of Ireland as the Map in *Figure 4* shows. These schools were selected because they were able to satisfy the requirements which had been set out in advance. All schools had a proven track record of ICT within their schools and were able to nominate teachers who possessed the appropriate skill set and experience.



Figure 4 Map of JCCiA schools in Ireland

The majority of the schools involved in the JCCiA initiative were ETB School with almost 65% of the schools are under the ETB. The rest of the schools were a mixture of Community School 7.8%, Secondary School 23.5% and Comprehensive School accounting for less than 4% as the chart below outlines. There are many reasons for the high proportion of ETB schools. In part, it is due to the history of ETB schools in Ireland: There were sixteen statutory regional education authorities (ETBs) in Ireland, and they were all established by the Education and Training Boards Act 2013 following the amalgamation of 33 regional Vocational Education Committees¹⁷. In part, it is due to the overall proportion of ETB schools: Of the 715 post-primary

¹⁷ Characteristic Spirit and ETB schools. Available at: <https://www.etbi.ie/wp-content/uploads/2016/07/ETBI-News-Summer-2016-web.pdf>

schools in Ireland,¹⁸ 253 are ETB schools.¹⁹ In addition to this, the division is primarily impacted by the schools which applied to the JCCiA initiative with the majority of schools being ETB schools; this was closely followed by Secondary Schools who made up 40% of applications, Community schools and Comprehensive Schools accounted for 11.6% and 3.5% respectively.

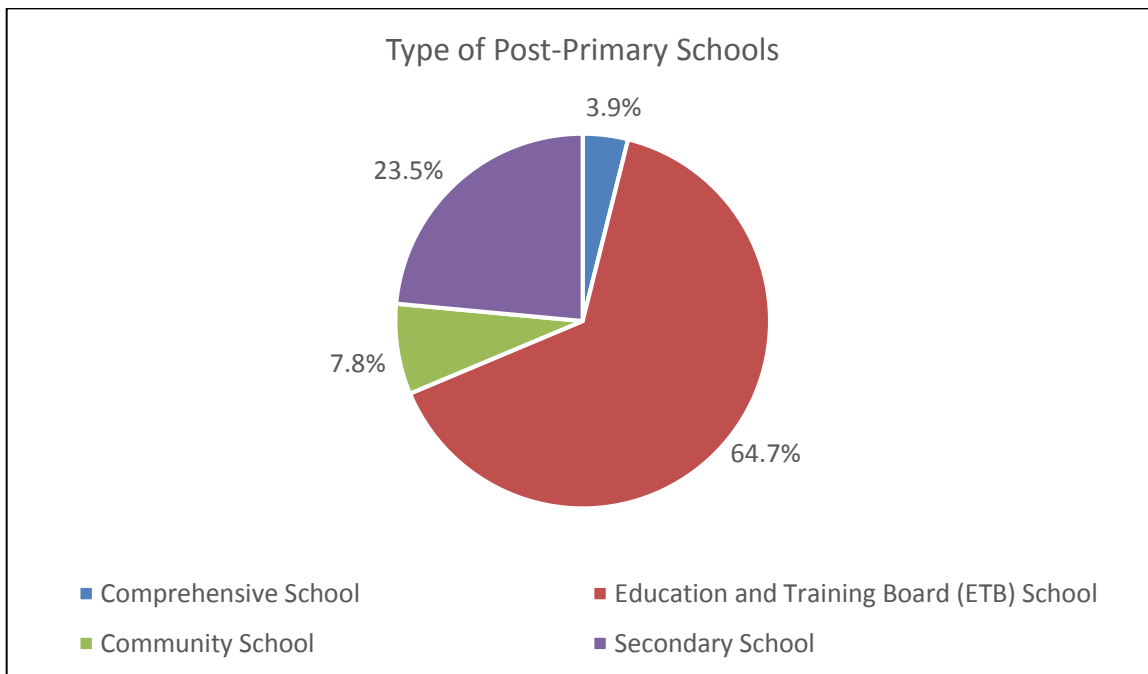


Figure 5 Type of School

Following extensive examination and deliberation, the final list of schools was selected to join the JCCiA initiative; this was done to reflect the interest in the JCCiA programme as well as to ensure the cohesion of the programme. This figure marks a significant increase for the twenty-two schools who took part in the *Exploring Coding* initiative. Throughout two academic years, from September 2017, the JCT worked with each of these schools.

¹⁸ Data on Individual Schools. Available at: <https://www.education.ie/en/Publications/Statistics/Data-on-Individual-Schools/>

¹⁹ <https://www.etbi.ie/all-etb-schools/>

Section 2 Review and outline of the CPD events and schools' visits

The JCCiA initiative seeks to build on the experience and to learn from the pilot CPD initiative - Exploring *Coding*. It too hopes to capture the experiences of schools and collate resources which can support their introduction of the short course in *Coding*. It also intends to share the above experiences and resources to inform the broader community of schools who wish to introduce the short course in *Coding*, and agencies who seek to support schools in this work. During the first year of the initiative, schools and teachers who were successful in their applications were given an opportunity to:

- Participate in three core CPD events, which were designed and facilitated by JCT team and JCT associates, in regional locations across the country.
- Receive an optional school visit from a member of the JCT short course team and a JCT associate.
- Access online school term 'Sharing of Practice' Webinars.
- Share their thoughts, knowledge and experiences with fellow teachers and the JCT short courses team.
- Participate in a range of optional elective events.

2.1 Timeline of CPD Events

The timeline of the CPD events, elective events, online support, and school visits, during year one of JCCiA, was designed to give teachers the maximum opportunity to engage in impactful and informative professional development. It was also hoped that the diverse nature of the content and contact would cause the least amount of disruption to students, teachers and schools while providing sufficient support. Throughout the year, teachers were expected to attend three CPD day events; these are listed above as CPD Events 1, 2, and 3. They also had one elective event and a school visit which would be utilised to enhance teacher's subject knowledge and support teachers and schools in their implementation of the JC short course in *Coding*.

As part of the ongoing support, monthly webinars were held in many topical areas. As part of the initiative, this was also an opportunity for teachers to share their practice during these online sessions. In general, webinars took place between 7.30pm – 8.30pm, this time was deemed to be the most suitable as it allowed teachers ample time to complete their daily tasks before the webinars began. The online and informal nature of these webinars was used to increase teacher's participation and engagement. Invitations for these online events were issued in advance via email so that teachers received advanced notice and a direct link to connect with other JCCiA teachers and the webinar facilitators. On most occasions, a flipped approach was used, whereby a video file was issued to teachers one week in advance of the webinar. This video was then discussed during the evening webinar, with the focus then being on responses and

questions relating to the video. All participants had access to the online discussion forum that could be used at any time to pose questions and share ideas.

Great care was taken to ensure adequate contact time with subject experts and facilitators of the program. A full outline of the timeline of the events which took place in the first year of the program can be found below:

Indicative Timeline for Year 1	
<i>March 2017</i>	Schools are informed regarding expression of interest process.
<i>Friday 28th April 2017</i>	Closing date for schools to express interest in participating.
<i>October 2017</i>	<u>CPD Event 1</u> – The short course in Coding – First Steps This full-day event will take place on a regional basis. Substitution is provided for participating teachers. A member of school management is requested to attend.
<i>November 2017</i>	<u>CPD Event 2</u> – Coding – Developing quality learning experiences using learning outcomes This full-day event will take place on a regional basis. Substitution is provided for participating teachers.
<i>January 2018</i>	<u>Elective Event</u> – Supporting student learning using electronic devices This elective event will take place on a regional basis
<i>February 2018</i>	<u>CPD Event 3</u> – Classroom strategies to support student learning in Coding This full-day event will take place on a regional basis. Substitution is provided for participating teachers.
<i>April 2018</i>	<u>School Visit</u> – Progress within our School This school visit from a member of the JCT short courses team will support teachers and school management.
<i>October 2017 - May 2018</i>	Ongoing Online CPD Support

Figure 6 JCCiA Timeline for Year 1

2. 2 CPD Cluster Days

All of the CPD cluster days, were designed with a clear focus, and it was hoped that they would introduce the teachers to the programme, facilitate a sharing of practice/networking, and offer an opportunity to discuss with teachers the core issue of planning, with respect to learning outcomes, and units of work. The attendance at this CPD event was very good with all schools enrolled in JCCiA being represented by one or more teachers at the regional event.

The CPD events began in October of 2017, and an outline of the core CPD days in year one JCCiA can be seen below:

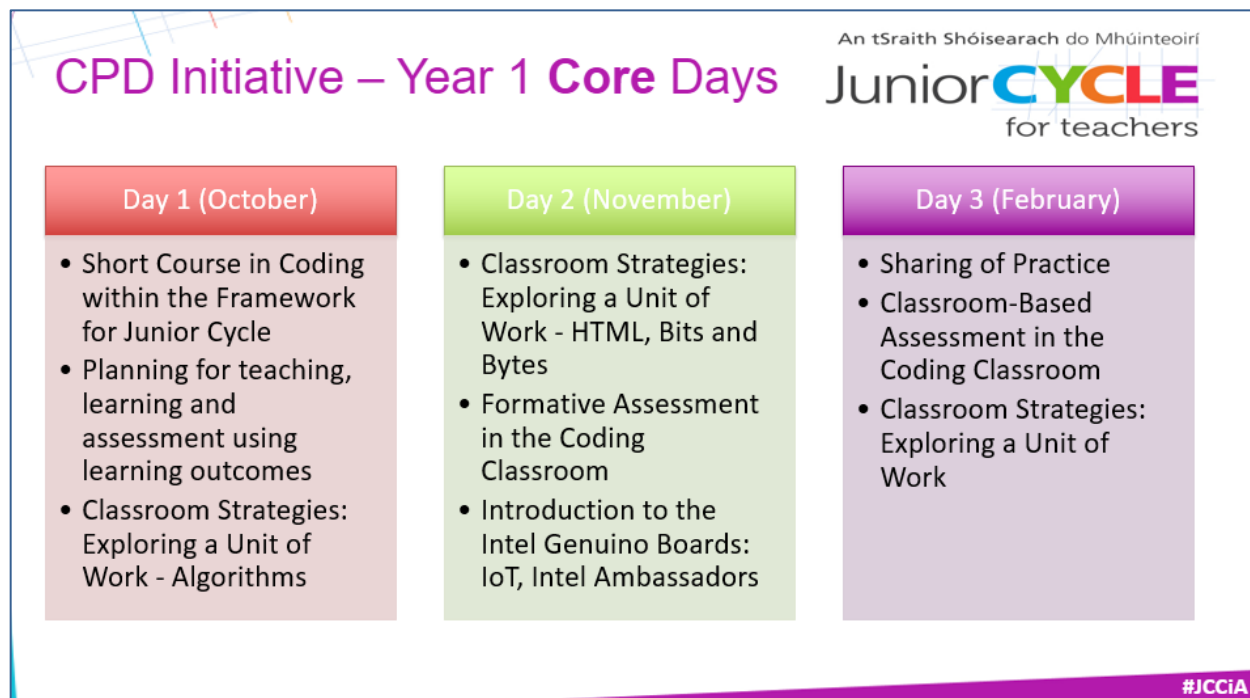


Figure 7 Year 1 Core Days

The first full-day event took place in various regional centres across the country in October of 2017. The JCCiA schools were asked to attend at their nearest CPD venues. These were spread across the country to ensure that teachers did not have to travel further than necessary. These events took place in Navan, Limerick, Cork, Sligo, and Dublin.

The second CPD event took place in November of 2017. The facilitators focused on developing quality learning experiences using learning outcomes and formative assessment. Once again, the CPD days were divided up into regional cluster meetings.

The third core CPD event took place in February 2018; it was designed to assist teachers in their development of classroom strategies which would support student learning in *Coding*. This full-day event took place on a regional basis.

2.3 Elective CPD Days

Following the second CPD event, a series of elective days were held around the country by industry partners. In November of 2017, the elective event was an Introduction to the range of *Coding* supports offered to teachers by Apple. During the day, Apple showcased *Swift Playground*; they explained some of the code used. At this event, they introduced iOS App development using the Swift programming language (Apple). This event took place in Apples European HQ in Cork. Apple collaborated with and supported the work of the JCCiA team both before and during this event so that the day was a success.

In December of 2017, the elective event which took place was designed to introduce a range of *Coding* supports designed by Microsoft to the teachers. During this event, teachers were given an opportunity to engage with Kinect, Microbits, Minecraft, and to write code. This event took place in Microsoft Ireland in Sandymount Industrial Estate, Dublin. The JCT and the teachers involved expressed thanks to Microsoft for their enthusiasm, work and support throughout the day. The teachers who attended the Microsoft elective day were given Microbits.

January of 2018: An elective event, which was designed to supporting student learning using electronic devices took place in the Intel Ireland Campus in Leixlip, Co. Kildare. The JCT and the teachers involved are grateful to Intel Ireland for their collaborative work and support. Teachers who attended the Intel Ireland elective day were kindly presented with Arduino 101 boards.

The CPD events were spread throughout the country so that teachers had an opportunity to visit events which were taking place in a diverse range of location, while not all sites were accessible to all teachers, many made efforts to attend more than one elective CPD event. In March of 2018: The Computers in Education Society of Ireland (CESI) Conference took place, titled 'Shaping Tomorrow Today' and was located on the Dublin City University St. Patrick's Campus. CESI was very helpful and worked collaboratively with the JCT and the team at Lero; they gave their support and guidance to the teachers enrolled on the JCCiA programme.

2. 4 School Visits

In April 2018, a subset of the schools who were taking part in the JCCiA programme were visited by members of the JCT short courses team and Lero. The visits were conducted to discover what progress was being made within the schools. The school visits were designed to provide support to teachers and school management for schools enrolled in the JCCiA programme. As evident from Figure 4, the schools enrolled in the JCCiA initiative were spread across a vast geographical area. The majority of visits were carried out over six weeks, two schools were visited before this six-week period began, and six schools were visited by the team afterwards. During these visits, feedback was gathered, and the data was analysed to conclude the impact of CPD activities.

Section 3 Impact of CPD Activities

As stated above during each CPD event and the school visits feedback was gathered from the teachers involved in JCCiA. Each CPD event was designed so that it would be closely aligned with a vision of teachers as lifelong learners. This lifelong learning is necessary in the computer science disciplines, to update and improve both subject knowledge and pedagogical knowledge. A high quality, sustained, coherent, and supportive model of CPD has the potential to incentivise and support teachers throughout their teaching life and to harness existing and potential links between formal and informal CPD providers. The aim of the CPD events, which took place in the first year of JCCiA, was to support the teacher and their schools and as they introduced the *Coding* short course. Also, it sought further, to facilitate actively engaged discussions between JCCiA teachers and to assist them as they developed resources and deepen their knowledge of the assessment and to foster growth in their confidence.

Throughout the process, it was of the utmost importance that the project received regular feedback from the teachers involved. After each CPD day, feedback was gathered either informally through discussion or formally through written responses.

3.1 Teacher Involvement

Schools were asked ‘How many teachers are active members of the short course in the *Coding* department within your school?’ Over 40% of schools stated that there were two teachers actively working within their *Coding* department. While this is very positive, it is important to acknowledge that 23% only had one teacher within the department. This is not an ideal situation for either the teacher or schools involved and efforts were made during school visits to reach out to these schools. On a positive note, the remainder of schools, 35.7% of schools had three or more active members within their *Coding* departments with some schools having more than eight members.

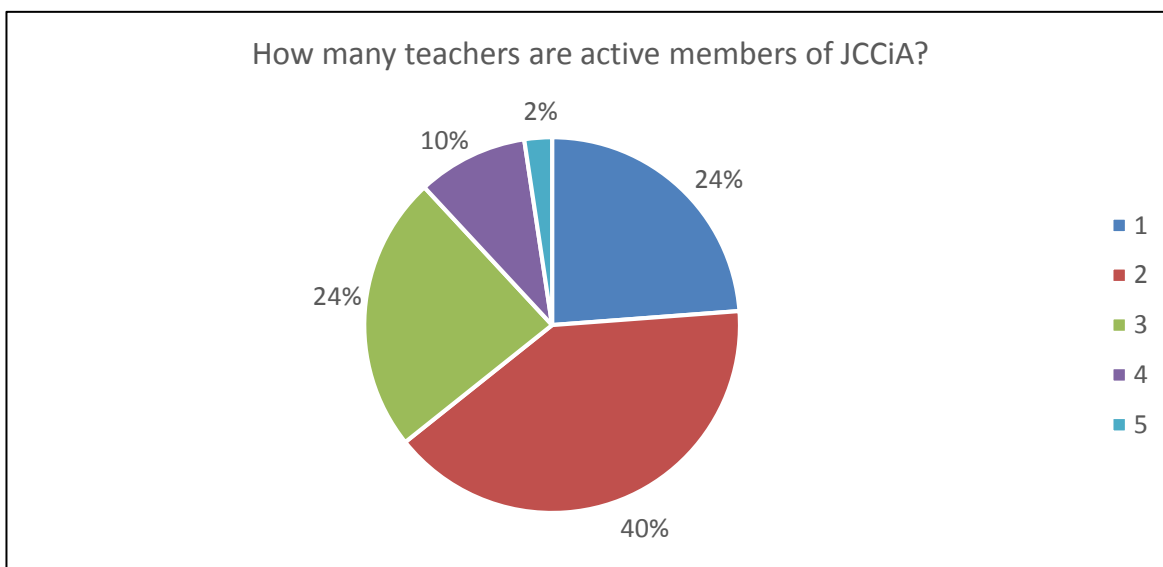


Figure 8 How many teachers are active members of JCCiA?

3. 2 Teacher Feedback on CPD Days

During the regional CPD days, teachers were asked for their feedback on the sessions and what they would like the CPD days to address of moving forward. Some of this data was gathered informally, and the information was utilised in real time. To collect data which could be shared and analysed the decision was made to ask teachers to respond to two questions. CPD Day took place in the first week of February 2018.

The question which were asked were:

What was one aspect of this year's CPD programme of most benefit to you (The Star)?

What do one aspect of CPD you feel should be covered in future events (The Wish)?

The responses to these questions were extraordinarily varied due to the open-ended nature of the question. To understand the responses of teachers the data was read in its totality and analysed to find themes which were emerging in the responses. The data were then coded under headings which included the value of the classroom resources, units of work, assessment, etc. The extensive list of topics can be seen below.

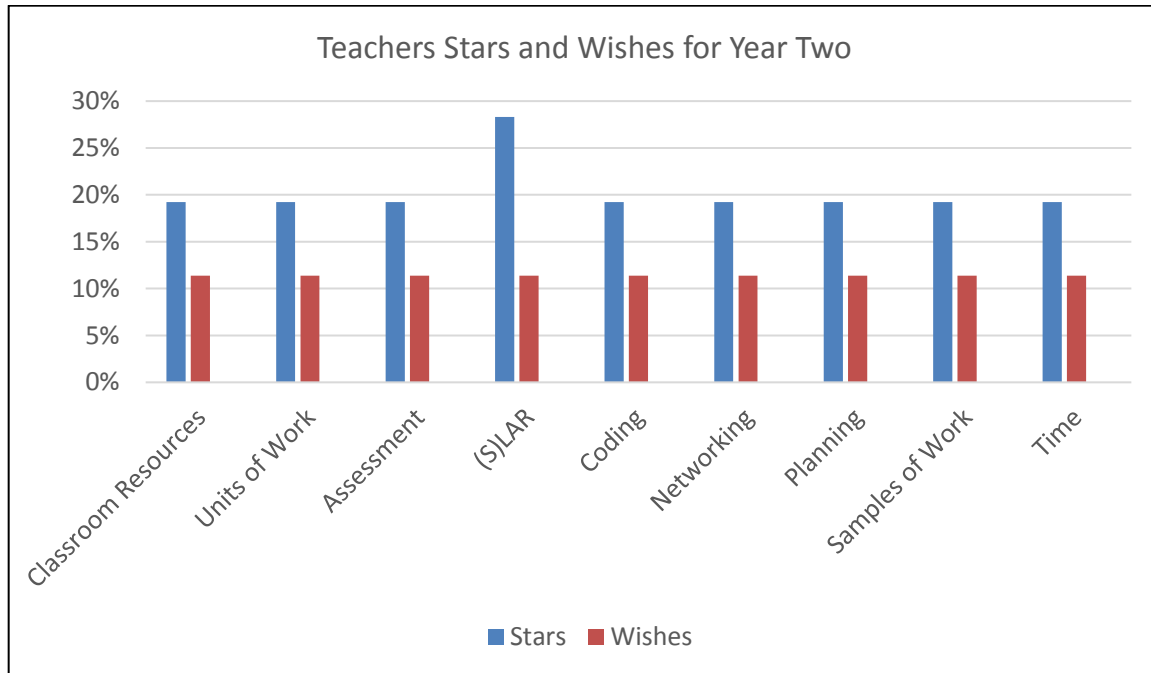


Figure 9 Stars and Wishes Graph

As the graph shows, most teachers stated that one of their stars from the CPD day was the Classroom Resources which was developed during the day while the element which they would most like to see included in future CPD days was Assessment. The following three examples are representative of the overall desire of teachers to have:

1. "Some additional guidance and help on CBAs - suitable/unsuitable projects."
2. "A comparison of current assessment methods v the new CBA etc. systems (side-by-side)."
3. "Looking at CBAs in more detail by using sample work so that a better understanding of the standards and requirements are achieved."

Section 4 Progress within schools during the project

During year one of JCCiA, teachers and schools were given an opportunity to engage with a dedicated team of professionals whose aim it was to assist them as they brought the new JC short course in *Coding* to their students. As mentioned above there were several CPD opportunities for teachers, as well as support visits to schools. A final survey was conducted at the end of year one of JCCiA, in which teachers were asked to reflect on their current practice and to discuss their plans and aim for their future practice.

Within the survey, teachers were asked about the success and challenges which they faced during the first year of the programme. They were also asked about numbers of hours each year group receives in *Coding* if *Coding* is offered to all or some within their schools, student experience of *Coding*, and for their opinion on the successes and challenges at a school level since the introduction of *Coding* into their schools. This following chapter will discuss the responses of teachers to these questions and drawing on all the information which has been gathered during year one of JCCiA create recommendations for JCCiA moving forward.

4.1 Coding in Schools

As part of the final school, survey schools were asked about the nature of the rollout of *Coding* and whether they offered *Coding* to all of their students as a core component of the JC curriculum or as an optional component of the JC curriculum. The response to this question was very interesting with 59.5% of schools stating that they currently offer *Coding* to all students. When schools were asked what they intended to do in the future the number of the respondents who indicated that they would offer *Coding* to all fell to 52.4%

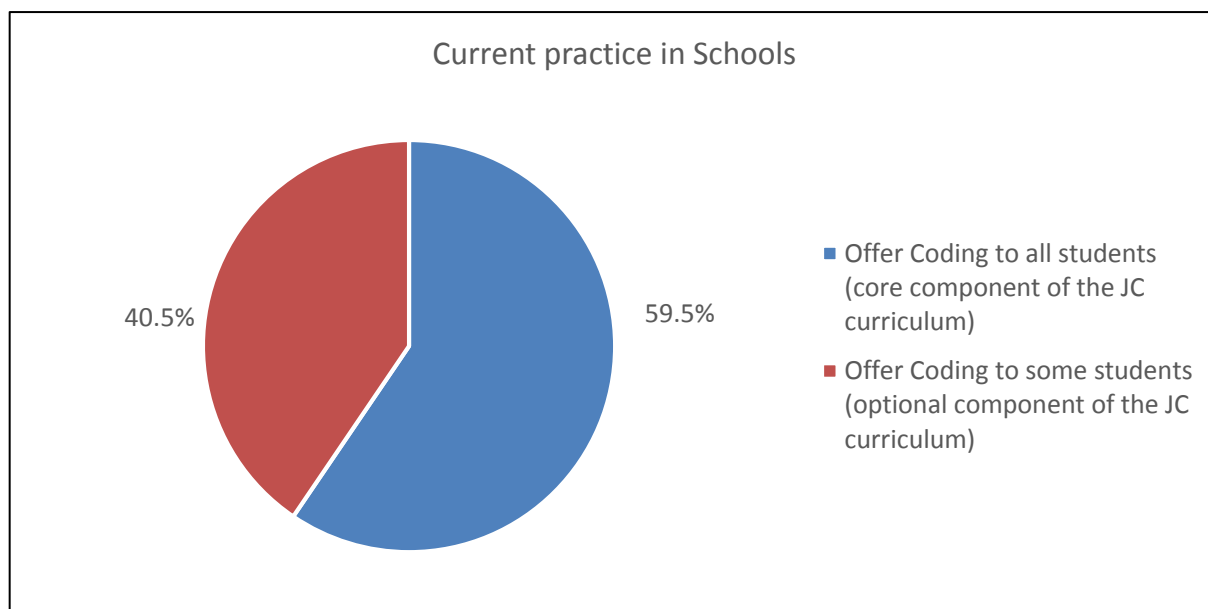


Figure 10 School current practice

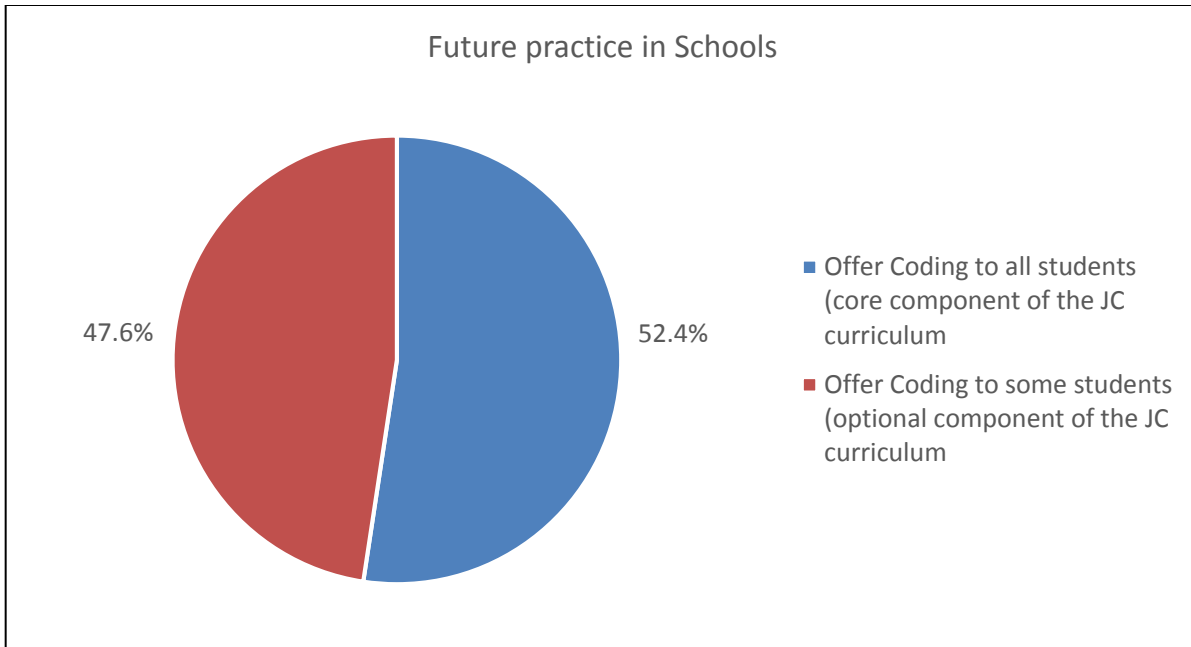


Figure 11 Schools future practice

In addition to this, schools were asked if they wished to continue to participate in the JCCiA CPD initiative in the next academic year. The response to these questions was overwhelmingly positive with only one respondent stating that they did not wish to continue.

Student Timetable

This positivity is reflected in the number of students who are engaged in *Coding* short course within the schools. As shown in the graph below, a large number of schools are not offering *Coding* to third-year students. However, the number falls in second year and is dramatically less in first year. In conjunction, to this, there is an increase in the number of class periods with which first-year students are being provided. The question asked was “During this academic year, how many students are engaging in *Coding* in your school?” As can be seen with each new cohort of students a greater number are being given an opportunity to develop and engage with this unique area of learning.

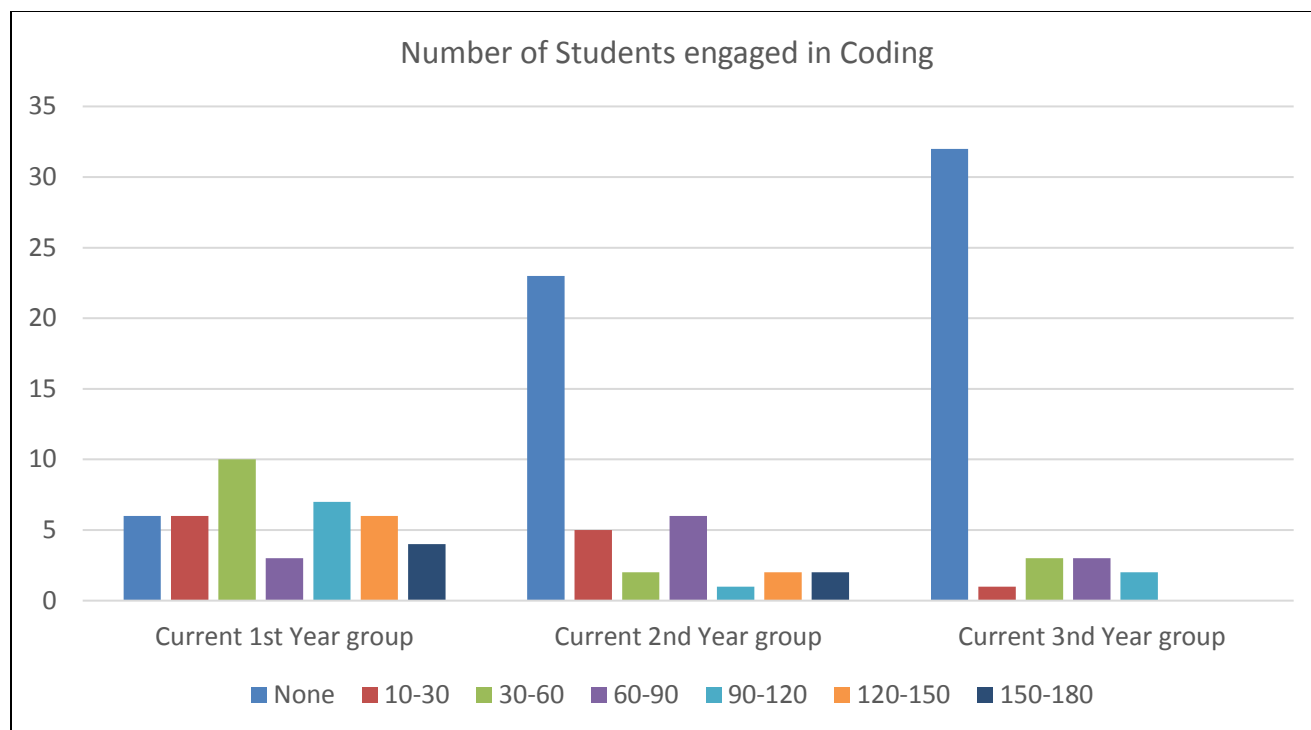


Figure 12 Number of Students engaged in Coding

All schools involved in JCCiA, are offering the 100 hours of classroom time to their students. Data showed that for schools new to JCCiA the majority of this time is timetabled for first years. The general trend is that all schools are offering more than the required number of hours.

4. 2 Success and Challenges of JCCiA

Feedback was gathered on year one of JCCiA during the spring of 2018; teachers were asked what the most significant success and challenges at both a school and a classroom level since they began JCCiA. The responses to this question were various; however, themes emerged within the answers, and these will be discussed below.

Successes of JCCiA

Teachers identified the wide range of achievements within the classroom and the school following year one of JCCiA, the comments of teachers were examined to find commonalities and themes. Following completion of the examination of teachers responses, five key areas of success were most common; they were as follows:

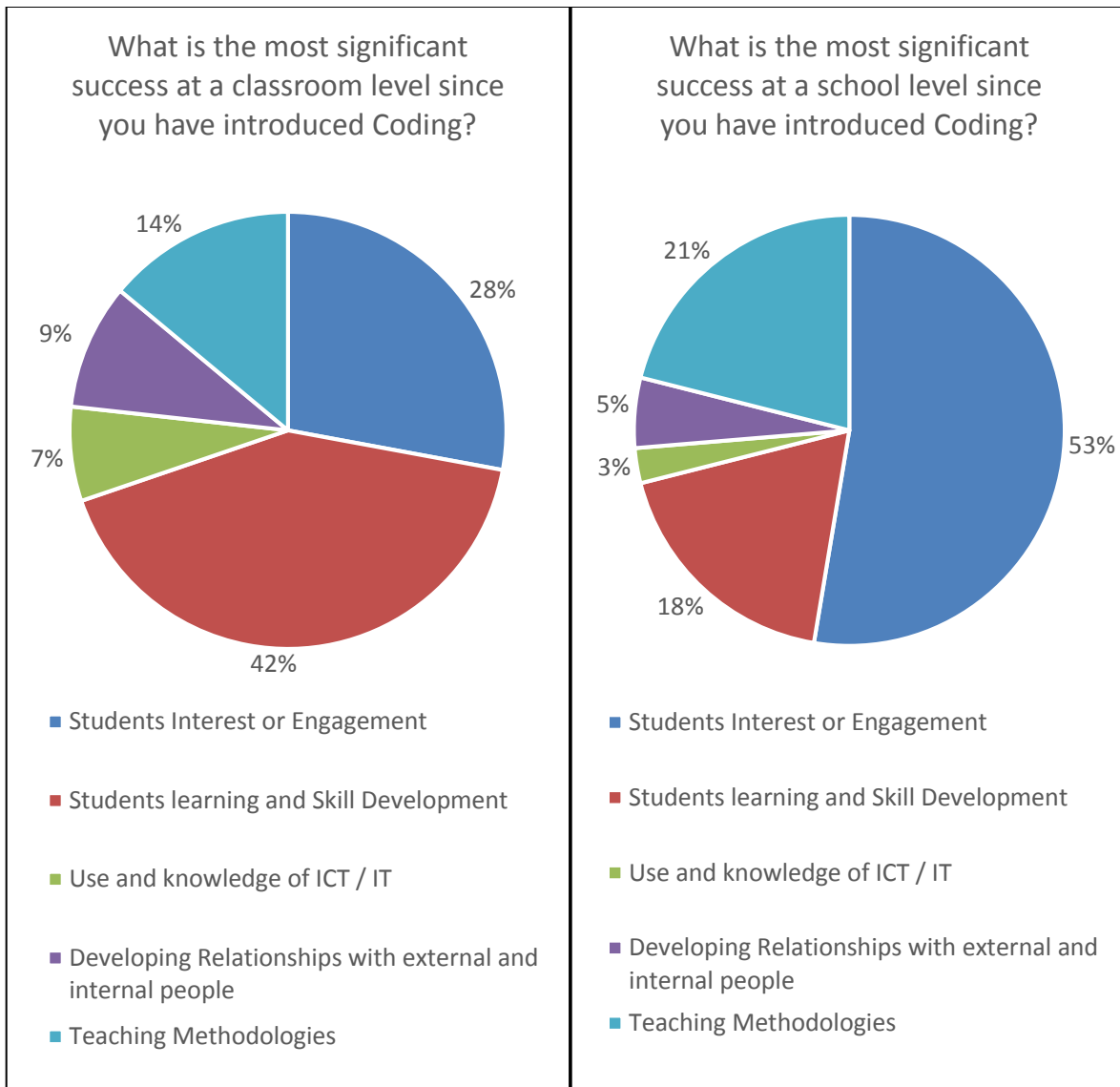


Figure 13 Success in Classroom/ School during JCCiA

1. Students interest or engagement

Student interest and engage in the JC short course *in Coding* was reported to be very high. Forty percentage of teachers referenced the positive student interest in *Coding* directly as the key success of JCCiA. With several teachers, stating that both parents and students were excited by the course and that because of their inclusion in JCCiA their school had received increased interest and attention. One teacher stated that:

At a recent school awards event, we showed a short clip of students engaged in Coding and interest from parents increased as a result. Students have expressed a good deal of satisfaction in their progress in Coding.

The second part of this teachers comment, which relates to student satisfaction with their progress

was echoed by many other teachers, who noted an ...increased interest in coding in first year...", "...the interest from students in coding has increased..." and the programme has led to a "...wide interest in Computer Science...". Another teacher commented that "...students are very enthusiastic [about *Coding*]..." and that they received "...very positive feedback from the parents at the parent-teacher meeting".

2. Students learning and skill development

Forty percent of the comments from teachers can be encapsulated under the umbrella term of student learning and skill development. One teacher, wrote, "...students have become more confident in *Coding*. They have learned the importance of resilience...". Another teacher stated that the success of JCCiA has seen "...almost all students achieve a level of success in the various aspects of *Coding*. Making it fun & interactive for them..." With this kind of positive feedback from teachers, it is clear that many feel the success of the programme has been students acquisition of skills and increased learning in this area. A number of teachers commented on how the use of differentiated tasks, during CPD days, allowed them to facilitate and adapt planning for the needs of all students within their own classroom.

3. Use and knowledge of ICT/IT

While it is the smallest subsection, it was still important to mention the comments of teachers who choose to focus their answer on ICT. It may have been possible to incorporate this into skill development subset there was a distinction made by teachers to highlight student competence within the area of ICT and Information Technology (IT) skills that students had developed by engaging in the short course. One respondent which was filled under this heading stated that students "...competency and confidence using IT have greatly improved". Another claimed that "...some students came with no experience in IT... [but, that following completion of the short course, they had] ...a huge advantage over their peers". Another stated that they had seen a noticeable, "...Improvement in ICT skills, Computational Thinking & Problem Solving". Many teachers noted that hardware, such as desktops, Arduino Uno boards, Lego Mind storms, and Vex robotics are being used within their classrooms.

4. Relationships with external and internal people

Thirteen percent of comments were focused on the positive impact which JCCiA, had on the development of relationships within schools, with follow teachers also engaged in JCCiA, with the JCT team, and with external people who they had been introduced to while taking part in JCCiA events. It was clear from the respondents, that "...learning together..." was a key component of JCCiA. With the community and sharing of practice being mentioned by many: one teacher said that for them the success of JCCiA was that within their school they became "...a team sharing knowledge and resources" and "...planning together...". Another teacher spoke about the support received during the CPD events, adding "...working in pairs and peer support helped me to feel like part of a team". Some teachers, saw the development of external links as the key success, with two teachers commenting that JCCiA gave them the opportunity to "...establishing links..." with a third

level institutions. Some teachers saw staff participation, in this external courses to up skill, increasing teamwork and helping to engage all teachers in a "...sharing of resources and ideas..." .

5. Teaching Methodologies

The JCCiA gave teachers the security to develop and adapt their teaching methodologies to an entirely new subject area. One teacher put it into words which are impossible to paraphrase, when they very eloquently stated:

As teachers, we've come out of comfort zones & come away from teaching the basic MS office skills. The staff skill set has expanded, but also the teacher-student dynamic has changed as we grow in our learning.

Challenges of JCCiA

To incorporate *Coding*, and indeed computer science, as a part of the curriculum the vast cohort of participating teachers identified the need for further training, support, and the development of resources. It was mentioned that these should support learning and teaching, and provide clarity particularly in the area of pedagogical approaches and assessment to the teacher.

Some teachers requested further upskilling in the use of electronic devices, such as the Intel Galileo board, to support student learning. Although some of the participating teachers possessed qualifications in computer science, support for the development of further classroom specific expertise was called for. A number of teachers felt it important to explore, the possibility of receiving Teaching Council recognition for as part of the engagement in numerous CPD events.

Of course, there were some general issues which were brought to light during the first year of the JCCiA initiative:

1. Timetable

For 20% of teachers stated that timetabling posed the most significant challenge in a classroom level and 29% reported that it was the most significant challenge at a school level. At a classroom level, teachers said things like "...students wanting to take more *Coding* classes". Another noted that a single class each week "...does not aid retention of subject materials...", in conjunction with this absenteeism among teachers and students was noted as a significant disruptor to this single class structure.

On a school level, teachers stated that it was challenging finding time to meet with fellow members of their "...*coding* team to cover schemes and planning...". Also, in relation to timetable "...pupil ratio..." and "...class size..." was mentioned as challenges which JCCiA teachers faced.

2. Resources

At a classroom level, 26% of teachers said that resources were the most significant challenge which they faced. Resources were mentioned by 49% of teachers of teachers when they were asked the same question about the school level. The issues with regards to resources were varied, with some teachers writing lists of resources which they felt would improve students learning, while others simple writing one word, "Wi-Fi".

One teacher stated the need to have “...an appropriate learning space, e.g. somewhere that facilitates group work and unplugged tasks (rather than a computer room)”. Another specific need which was uncovered was that need for “Resource’s in Irish”.

On a more general note, many comments were from teachers asking for exemplars of work. An additional, issues which many teachers noted was their struggle with “...broken and old PCs...”, “...no book/materials available...”, and “Laptop issues - windows, flash updates etc.”. Others stated their desire to purchase new equipment for their students and “...lack of money to buy equipment...” as the greatest challenge. One teacher offering a solution to these issues by stating that, “*Coding* should have a dedicated yearly budget, just like other subjects to allow us to build up resources”.

3. Student Skills

Student skill was something which was mentioned by 20% of teachers at a classroom level; however, it was only mentioned by 3% of teachers as having significance at a school level. In the classroom, the variation of student’s ability was a contentious issue, which was exasperated by the above factors, with teachers stating that they were struggling “...to manage that within a single period in the computer” and to “managing the different abilities in the classroom as regards basic skills”. For others, the issues around student skills were focused on digital illiteracy. One teacher stated that in their school the “level of digital literacy from students starting the first year is much lower than anticipated”.

With regards, to student skill, bridging the digital divide was mentioned as one teacher said, “Some students have significantly less computer literacy. Managing the large deviation in student *Coding* ability”.

Student *Coding* and logical thinking skills were an issue for some, with one teacher stating that they felt “the weaker students sometimes struggle with it” and another that “the logical thinking part of *Coding* is not suitable for all students”. The opinions of these teachers are important to note as it is critical that the rhetoric around this new area of learning be inclusive for all learners, and some teachers had the opposite view stated that “ASD (Autism spectrum disorder) students, in particular, have had great traction with this initiative”.

4. Student interest

As can be seen in the charts below, a student interested within the classroom was seen as a challenge by 11% of respondents, and it was not noted as a challenge at all on a whole school basis. For the teachers who saw it as a challenge within the classroom they felt that because, as one teacher put it “*Coding* is a core component across the timetable, meaning some students lack interest”. Another teacher stated that “...getting all students to engage fully...” was a challenge which they faced.

5. Teaching Methodologies

This section which has been headlined under teaching methodologies comprises the principles and methods used by teachers to enable student learning. It accounts for 23% of classroom level and 21% of school level most significant challenges. These strategies are designed to merge subject

content and student learning. Teachers noted the tremendous amount of time which they had to dedicate to “Making up the course... [using the] ... guidelines from workshops...” as a reference point. From a number of responses, it was clear that teachers were becoming increasingly tired of the demands of this, one teacher stated: “...trying many approaches, methodologies and techniques and watching the best-laid plans go up in smoke has been a real challenge”. Their opinion was echoed by others who commented for them that the greatest challenge was:

- “Developing the course.”
- “...designing successful teaching methodologies that grab the student’s interest and align with the JCT learning outcomes.”
- “Varying the teaching approaches and some of the *Coding* concepts are quite challenging to make accessible for the student.”

For teachers, this juxtaposition between improving their “...own knowledge...” while designing and delivering content which is accessible and engaging for all proved to be a significant challenge. AS one teacher said the greatest challenge for them was:

I feel I'm not an expert at it yet so continually trying to make it relevant, realistic & interesting for them while upskilling my own knowledge to do so.

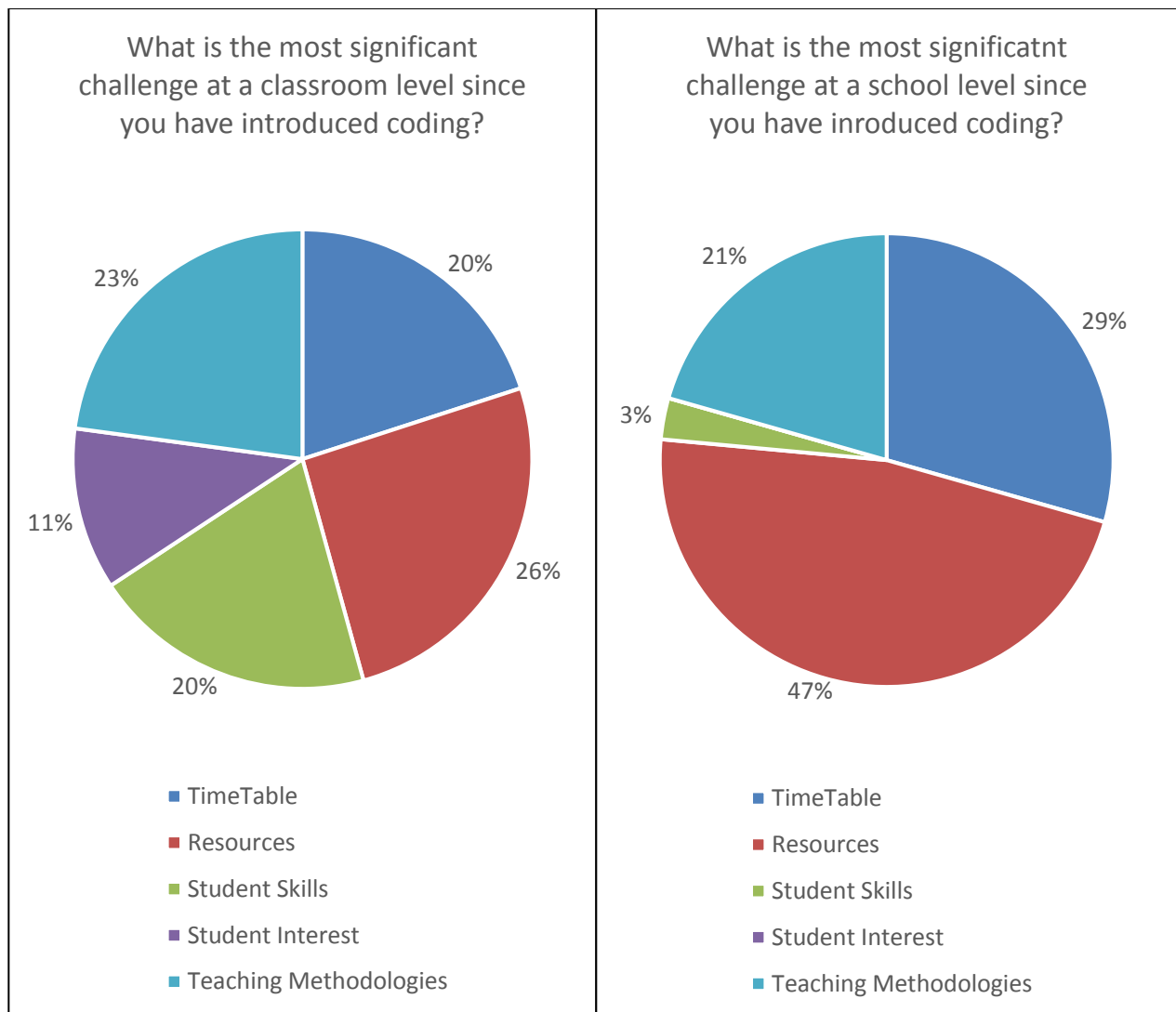


Figure 14 Challenges within the Classroom/ School during JCCiA

From the data that we have gathered and the feedback which was received during the school visits, it is clear that the teachers involved have been pleased with the JCCiA initiative. Progress within the schools has been highlighted by many involved. The nine schools who took part in both the JCCiA and the *Exploring Coding* initiative noted most strongly their feeling that there has been a profound growth in the schools between the start of *JC Coding* in 2016 and the end of the first year of the JCCiA in 2018.

Section 5 Conclusion

The outcomes from CPD events year one are clear and have had an impact on teachers, students, and all those involved in JCCiA. Following the first year, there is now a clear plan going forward with all stakeholders being aware of the specific targets and the timeline of assessments. There is also a structure for how CPD might be delivered over the next three years and a brief outline of what the content of these CPD days will contain. In addition to the practicalities which was clarified, greater relationships between the various persons involved in JCCiA was developed, positive approaches to the sharing of tasks, and the preparation of materials.

5. 1 Findings of year one of JCCiA

During the first year of JCCiA, there was an uptake in the number of hours of the short course in *Coding* being offered in a structured and formal way.

It was reassuring to see that the most explicit developments were made in schools who also took part in the *Exploring Coding* initiative. The reasoning behind this can be attributed to the time that students, teachers and schools have had to feel confident with the new short course system and the nuance of this new subject area. With regards to this, it is essential to state that the data for this report was gathered during the first year of the JCCiA programme.

Teachers found the exemplars of the following: a scheme of work, an assessment, and Subject Learning and Assessment Review meetings (SLAR), to be beneficial towards their classroom practice. It was of great value to all schools involved to have a sharing of practice where teachers could discuss and share the different approaches which they have taken to the *Coding* short course. Teachers requested planning tools to help them as they prepared the delivery of the *Coding* in the second year of the scheme. Accordingly, the decision was taken to offer teachers further opportunities to plan and develop relevant resources and plan for the needs of students. Each of the teachers involved stated that they felt the CPD days helped them to build and build confidence by linking the learning outcomes with the JC short course in *Coding* specification and its related resources.

5. 2 Work within the schools during JCCiA

Of course, there were some areas where schools and teachers had to work hard to ensure that the short course in *Coding* was a success for both the students and the school community. Teachers, school management, and staff faced three main challenges during the first school year. These challenges were:

1. Timetabling of the short course within the school timetable. Schools had to decide who was going to study *Coding* (all or some) and ensuring students could receive recognition by completing the 100 hours). Many schools incorporated short courses into their timetable for the first time and additional time for management and the secretarial staff was needed to do this.
2. There were considerable changes taking place since the commencement of the JC reform. Students particularly felt these changes as they saw changes to their timetable, assessment as well as the

dynamic of classes. In some schools, this means additional training meetings and greater communication to the students and staff on technologies and resources.

3. Teachers engaged in formal CPD training (offered by the JCT), as well as, informal CPD events and many actively sought out additional training and upskilling. There is no doubt that these training days were needed. However, it is essential to acknowledge the support and understanding provided by the participating schools. It is always a challenge to schools when teachers are released for off-site training. However, it was wonderful to see the commitment of both teachers and schools to attend CPD events and to encourage the acquisition and development of the skill of staff.

It is of the utmost importance that data is gathered at the end of the JCCiA initiative in May of 2019 so that the findings of this report can influence future CPD. The research discovered when compiling the interim report will impact the content of the CPD events during year two of the JCCiA initiative and assist JCT Associates in the production of engaging and useful resources for all teachers involved in the programme.

Section 6 Recommendations

Perhaps the most challenging dilemma facing teachers today is the extent of the change in their professional lives. Recent developments across the education continuum in Ireland have seen a move away from the explicit specification of content towards a more generic, skill-based approach to discipline knowledge. In the area of the JC short courses, for the first time teachers are attempting to engage students in learning in new areas and disciplines. It is hoped that some of the findings of this report may assist in the development and support given to new and existing short courses in other disciplines.

Over the coming months, it is important that the success already seen throughout the JCCiA programme is sustained. It has had a clear impact on the teachers' involved in the programme with many stating that they had grown in confidence by engaging in the CPD events. The ability to share stories, discuss issues, and collaborate on resources development across different schools, are all things which teachers would like to see continued into the future.

6.1 Key Recommendations

This report would like to conclude with ten recommendations which are of interest to those involved in JCCiA and the wider education community. These recommendations have been shaped by the feedback which was gathered from teachers as well as through analysis of the data. This report would like to recommend:

1. That the NCCA develop samples/exemplars of work so that teachers have a clear understanding of the standard and grading through samples of projects.
2. That a second phase of JCCiA commences in September 2019, so that more schools will have a chance to engage with structured CPD specifically designed for this unique short course.
3. That the JCT creates a platform where teachers can upload and share resources, discuss their experiences and knowledge that they have acquired while teaching *Coding*.
4. That school management considers the importance of continuity, as well as teacher knowledge, and *Coding* experiences when deciding which teachers are going to teach *Coding* within the school.
5. That principals and schools continue to support teachers as they attend CPD events for all subject disciplines.
6. That teachers share resources, knowledge, and stories within the wider teaching community, through engagement with societies such as Computers in Education Society of Ireland (CESI).
7. That teachers encourage and support both students and their fellow teachers to engage with *Coding* and technology, in their schools.
8. That teachers engage with compsci.ie, which is a portal site, part of Scoilnet, created by and for teachers and students in Ireland. This site is accessible to all teachers.
9. That all schools who have taken part in the programme receive formal recognition of their commitment to JCCiA in Spring 2019.
10. That research continues to be conducted into the long-term impact of the *Coding* short course.

6. 2 Acknowledgement

The author of this report would like to acknowledge the support of the JCT, Lero, SFI and Epi*stem, without their support this report would not be possible. It was vital that partnerships be developed and strong relationship fostered between the educators, industry and researchers to ensure the success of JCCiA.

In particular, it is important to recognise the support of the JCT associates and team members. They worked closely with every school who participated in the JCCiA programme over the past twelve months. The JCT team members and associates worked tirelessly to aid and encourage teachers as they introduced the short course.

Lastly and most importantly this report would like to acknowledge all of the parents, school staff, and students who have engaged with JCCiA. Without the involvement of these people, the *Coding* short course would not have happened, and it is hoped that each of the schools involved will receive formal recognition for their hard work and dedication once JCCiA comes to an end in 2019. In addition to this, it is hoped that students will receive formal recognition for their learning once they complete their JC programme.

A sincere thanks would like to be extended to the following organisations for providing equipment, time, and support to the schools and teachers involved in JCCiA:

- Apple
- Google
- Intel Ireland
- Microsoft

The teachers who attended the Intel elective day were kindly presented with *Arduino 101 boards* and those who attended the Microsoft elective day were given *Microbits*.

Finally, thanks to all of the courageous and passionate teachers involved in JCCiA. They have transformed the lives of many young people by challenging, informing, and effectively engage young people in the short course in *Coding*. It is hoped that this will continue as both teachers and students grow in confidence over the next year of the programme and into the future.

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Appendix

Appendix I: Letter to Schools

An tSraith Shóisearach do Mhúinteoirí
JuniorCYCLE
for teachers

Monaghan Education Centre
Knockaconry, Armagh Road
Monaghan, Co. Monaghan

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6 March 2017

Dear Principal

Junior Cycle for Teachers (JCT), a Department of Education and Skills schools' support service, continues to provide high quality professional development opportunities for schools and teachers in the context of the implementation of the *Framework for Junior Cycle* (2015).

In 2015, we commenced a CPD initiative called *Exploring Coding* with 22 schools. This proved to be very successful in supporting these schools in their initial work with the new short course in Coding.

Building on the success of our Exploring Coding project, we are now launching a new two-year initiative, entitled *Junior Cycle: Coding in Action*. This new initiative is designed to support schools who are committed to introducing the short course in Coding within their Junior Cycle programme. We are delighted to have both Intel Ireland and Lero – The Irish Software Research Centre – continuing to collaborate with us on this follow-on innovative initiative.

There is a limit to the number of schools that can engage in this initiative. In order to participate, a school must complete an online 'Expression of Interest' form and provide details of two teachers that will engage in the initiative. The relevant online form can be accessed at <http://www.jct.ie/shortcourses/shortcourses.php>. The closing date for expressions of interest is **4.00pm on Friday 28th April 2017**.

Further details on the initiative are included in the attached information leaflet. Any queries can be emailed to info@jct.ie.

I look forward to hearing from you.

Yours sincerely



Dr. Pádraig Kirk


Director, CPD for Junior Cycle




Dr. Pádraig Kirk, Director, CPD for Junior Cycle
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Timeline



Thurs Dec 3 rd	Closing date for schools to express interest in participating
Mon Dec 7 th	Schools are informed regarding participation
Week of Jan 11 th	CPD Event 1 - Regional Sharing of Practice This evening session will take place at a local education centre
Fri Jan 22 nd	CPD Event 2 - Introduction to the Coding Short Course This will be a full-day event and substitution will be provided for participating teachers
Sat Feb 6 th	CPD Event 3 - Introduction to the Electronic Devices This full-day event will take place in the Intel Ireland campus in Leixlip, Kildare
Week of Apr 11 th	CPD Event 4 - Regional Progress Meeting This evening session will take place at a local education centre
Week of Dec 5 th	CPD Event 5 - Conclusion of Pilot Project This evening session will take place at a local education centre
Jan - Dec	Ongoing Online CPD Support



Exploring the
Short Course in Coding



*A research project involving the
use of electronic hardware devices*

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Junior Cycle for Teachers (JCT) Support Service
A Department of Education & Skills Schools' Support Service

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Introduction

This collaborative project is designed to support schools and teachers in exploring innovative options provided under the Framework for Junior Cycle. The project involves trialing the short course in Coding. Students and teachers will engage with new resources, develop their expertise, and share their experiences.

Intel Ireland has donated 1000 electronic hardware devices and 60 development kits to support this project. These small electronic devices enables students to develop prototype applications in engineering and computing, or other simple activities such as controlling a robot or controlling lighting systems from smart phones. This technology can enable students to create solutions for the good of society, or simply for the fun and challenge of being involved in innovation.

Participating schools and teachers will:

- Receive 60 electronic devices and 4 development kits per school
- Participate in two initial CPD events to share current practice and explore the short course in Coding.
- Attend a unique CPD event in the Intel Ireland Campus in Leixlip
- Contribute to an online community of participating teachers
- Share their experiences with the short course, the use of the electronic devices and inform the development of further supports for teachers

Project Aims

This project seeks to:

- Examine the current provision within schools for ICT-related curriculum components at Junior Cycle.
- Collate resources which can support the implementation of the short course
- Capture the experiences of schools in their trialing of the short course
- Capture successes and challenges in the use of the electronic devices
- Explore further options to support schools and teachers in their implementation of the short course in Coding

Application Process

In order to apply, a school must complete an online 'Expression of Interest' form and provide details of two teachers, employed by the school, who wish to engage in the project. The online form can be completed at:

<http://www.ict.ie/shortcourses/shortcourse/apply> and the closing date for expressions of interest is 4.00pm on Thursday 17th December.

Project Design

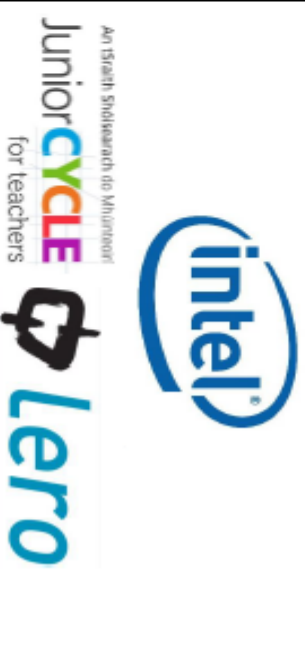
Approximately 14 schools - preferably that have existing practice in terms of Computer Science/Coding and Programming in their Junior Cycle programme and that wish to pilot aspects of the short course in Coding - will be offered the opportunity to take part in the project.

Each school will be requested to nominate two teachers.

Schools will be identified for participation using the following criteria:

- Schools that have engaged with the short course in Coding via NCCA consultation meetings and/ or Network Schools.
- Schools that have engaged in previous Lero initiatives
- Schools that meet the following criteria:
 - Possess existing practice and/ or teacher expertise in the learning area of Computer Science/Coding
 - Currently provide curricular time at Junior Cycle level to trial aspects of the short course in Coding.
 - School location to support the feasibility of this research project.

A collaborative project involving:



Notes:

1. All ETB schools are currently being notified and offered the opportunity to apply to participate. While only 14 school can be accommodated within this current research project, further opportunities will be available for schools during the 2016/17 academic year.
2. Additional resources may be required to support student learning with regard to the hardware provided in this project. A specification for these materials will be provided to participating schools.

Appendix III: List of JCCiA schools

The list of participating schools in the 'Coding in Action' initiative are:

School Name:	School Address:
Abbey Vocational School	The Glebe, Donegal Town
Adamstown Community College	Station Road, Adamstown, Lucan, Co.Dublin
Athy College	Athy, Co. Kildare
Bandon Grammar School	Clonakilty Road, Bandon, Co. Cork
Breifne College	Cootehill Rd Cavan
Carrick-on-Shannon Community School	Carrick-on-Shannon, Co. Leitrim.
CBS Thurles	Rossa Street, Thurles
Central Technical Institute	Clonmel, Co. Tipperary
Celbridge Community School	Moortown, Celbridge, Co Kildare
Coláiste an Chraoibhín	Duntahane Road, Fermoy, Co. Cork
Colaiste Bride Presentation Secondary School	New Road, Clondalkin Dublin 22
Coláiste Chiaráin	High Street, Croom, Limerick.
Coláiste Dún an Rí	Kingscourt, Co. Cavan
Coláiste Mhuire Johnstown	Johnstown, Co Kilkenny.
Coláiste Muire Ballymote	Ballymote, Co Sligo
Coláiste na bPiarsach	Ros Muc, Co. na Gaillimhe
Coláiste na Carraige	An Charraig, Dún na nGall
Coláiste na Coiribe	Gaillimh
Coláiste na Mí	Johnstown Educational Campus, Johnstown, Co. Meath
Confey College	Leixlip, Co Kildare
Crana College	Buncrana, Co. Donegal
Elphin Community College	Elphin, Co. Roscommon.
Errigal College	Windyhall Letterkenny Co. Donegal
Fingal Community College	Seatown Road, Swords, Co. Dublin
Gaelcholáiste Charraig Uí Leighin	Tigh Pháirc an Uisce, Carraig Uí Leighin, Co. Chorcaí
Gaelcholáiste Luimnigh	Meal Sior Anraí, Luimneach
Gaelcholáiste Mhuire A.G.	An Mhainistir Thuaidh, Corcaigh
Glenart College	Coolgreaney Road, Arklow, Co Wicklow
Grange Post Primary	Grange, Co. Sligo
Killorglin Community College	Langford Street, Killorglin, Co Kerry

Kingswood Community College	Kingswood Avenue, Tallaght Dublin 24
Kishoge Community College	Ninth Lock Road, Lucan, Co. Dublin
Le Chéile Secondary School	Hollystown Road, Tyrrelstown, Dublin 15
Marino College	14-20 Marino Mart, Fairview, Dublin 3
Mount Sion CBS Secondary School	Barrack Street Waterford
Naas Community College	Craddocktown Road, Naas, Co Kildare
Nenagh College	Dromin Rd, Nenagh, Co Tipperary
Ratoath College	Jamestown Ratoath Co Meath
St Aidans Comprehensive School	Cootehill Co Cavan
St Brogans College	Bandon, Co. Cork
St. Peter's	Passage West, Co Cork
St. Fanahan's College	Mitchelstown
St. Gerard's School	Thornhill Road, Bray, Co. Wicklow
St. Joseph's Secondary School Rush	Convent Lane Rush, Co. Dublin
St. Mark's Community School	Cookstown Road
St. Munchin's College	Corbally, Limerick
Sutton Park School	St Fintans Road Sutton Dublin13
Tarbert Comprehensive School	Tarbert, Listowel, Co. Kerry, V31 WD66
Terence MacSwiney Community College	Harbour View Road, Knocknaheeny, Cork
Thomond Community College	Moylish Park, Limerick
Virginia College	Virginia Co. Cavan