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|--------------------------|--|--|--------------------------|
| Subject: | Computing in Schools: Update | | |
| Date of Meeting: | 5 March 2018 | | |
| Report of: | Pinaki Ghoshal, Executive Director, Families, Children and Learning | | |
| Contact Officer: | Name: | Hilary Ferries | Tel: 01273 293738 |
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| Ward(s) affected: | All | | |

FOR GENERAL RELEASE**1. PURPOSE OF REPORT AND POLICY CONTEXT**

- 1.1 The report outlines the work that schools are doing in computing and coding and achievement of pupils at Key Stage Four.

2. RECOMMENDATIONS:

- 2.1 That the Committee supports and promotes the work that is being done in schools in the area of computing.
- 2.2 That the Committee promotes coding clubs to schools that do not have this provision.
- 2.3 That committee members, through their different roles, promote computing to girls.

3. CONTEXT/ BACKGROUND INFORMATION

- 3.1 The National Curriculum for primary and secondary schools (Key Stages One, Two, Three and Four) was revised and a new curriculum introduced in 2014. The name of the subject was changed from ICT (Information and Communications Technology) to Computing to reflect a change of emphasis in subject content.
- 3.2 The aims of the national curriculum for computing at all key stages are to ensure that all pupils:
- ♣ can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
 - ♣ can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
 - ♣ can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
 - ♣ are responsible, competent, confident and creative users of information and communication technology.

The full curriculum is available online at:

http://www.computingatschool.org.uk/data/uploads/primary_national_curriculum_-_computing.pdf

http://www.computingatschool.org.uk/data/uploads/secondary_national_curriculum_-_computing.pdf

- 3.3 This has had huge implications for teachers in terms of subject knowledge to deliver the new curriculum. A range of training and development opportunities have been and are put in place for school staff to support them with teaching and learning.
- 3.4 There have been several initiatives in school to prepare children and young people for the digital age. The Raspberry Pi Foundation run Code Clubs for primary schools and the Raspberry Pioneers programme for secondary schools. They currently lead approximately 30 clubs in schools. These are run as after school clubs, led by volunteers from local industry.
- 3.5 Some of the school partnerships have been running computing networks to enable teachers to meet to share practice and learn together. The ICT and Computing Consultant, based ICT Schools & Traded Services team, is a member of or supports four of the seven school partnership networks: the Partnership for Leading and Learning (PiLL), the Brighton City Education Partnership, the Portslade Partnership and the Preston and Patcham Partnership. He will soon be supporting the Deans.
- 3.6 There are two computing hubs in the city. The Primary hub, based at Westdene Primary School, will open in 2018. The hub will introduce the Master Teacher workshops to support teachers in their delivery of the computing curriculum. The secondary hub has been running for two years and is based at two centres: Dorothy Stringer and Blatchington Mill. The hub supports teachers in the use of computing in schools through running workshops and schools support.
- 3.7 The ICT and Computing Consultant, offers training and development packages – staff meetings and inset days, both for curriculum support and to support schools with data protection and online safety. An annual conference is organised for teachers to support them with computing. . Approximately 80 people attended the conference in 2017. The conference includes workshops on a range of themes, which in 2017 included data security, how to use SIMS to analyse data, Microsoft Office, iPads and their use in the classroom and practical workshops run by Code Club. One aspect that has already been identified is courses in computing for secondary non specialist teachers and the ICT and Computing Consultant is discussing this with the Pavilion and Downs Teaching School Alliance.

4. Data

- 4.1 Computing is a National Curriculum subject, but there is no published data for Key Stages One, Two or Three. All pupils have to study Computing, but they do not all have to take exams in the subject.
- 4.2 Schools offer a range of qualifications for ICT and Computing for Pupils at Key Stage Four, which fall into three groups:

- Computer Appreciation / Introduction,
- Information Communications Technology
- Computer Studies Computing/ Computer Science (GCSE)

4.3 Disadvantaged pupils

In Brighton & Hove pupils were entered for three ICT-related subjects. Of the city cohort, 589 were disadvantaged pupils and 2249 pupils were 'other'. Out of the pupils taking these subjects, most were entered for GCSE full courses in Information & Communications Technology, Computer Science, or Vocationally-Related Qualification (VRQ) Level 2 in Computer Appreciation / Introduction. A small number of pupils were entered for vocational qualifications.

4.4 Comparison to national rates of entry showed relatively fewer pupils were entered in ICT related qualifications. This can be mainly attributed to fewer pupils entered for the BCS Level 2 European Computer Driving Licence Certificate in IT Application Skills (VRQ ECDL level 2 in Computer Appreciation / Introduction) compared to the national average. Relatively more pupils were entered for full course GCSEs in information & Communications Technology and Computer Studies / Computing.

4.5 In all secondary schools some pupils were entered for the Computer Studies / Computing (Computer Science) GCSE full course. Five of nine secondary schools entered some pupils for Information & Communications Technology GCSE full course. Five of the nine secondary schools entered some pupils for VRQ ECDL level 2.

4.6 Compared to the national pattern more disadvantaged pupils were entered for GCSE ICT subjects in Brighton & Hove.

| Rate of entries as a % of pupils | Computer Appreciation / Introduction CN1 | | | | | | | Information & Communications Technology C | | | Computer Studies / Computin | Total |
|----------------------------------|---|-------------------------------|-------------------------------|--|---|---------------|------------------|---|--------------|------------------|-----------------------------------|-------|
| | Functional Skill at Entry Level | Functional Skill at Level 1 * | Functional Skill at Level 2 * | Advanced * National Cambridge OCR | National Certificate OCR Cambridge | VRQ Level 1 * | VRQ ECDL Level 2 | ELQ Band B * | ELQ Band C * | GCSE Full Course | GCSE Full Course | Total |
| All pupils | 0.7 | 0.4 | 0.2 | 0.5 | 1.2 | 1.0 | 9.7 | 0.4 | 0.0 | 16.1 | 14.8 | 45 |
| Disadvantaged pupils | 1.9 | 1.0 | 0.2 | 0.8 | 1.0 | 0.5 | 16.1 | 1.0 | 0.2 | 16.8 | 14.9 | 54.4 |
| National all pupils | 0.1 | 0.1 | 0.4 | 0.4 | 2.5 | 0.7 | 30.8 | 0.0 | 0.2 | 11.1 | 12.6 | 58.9 |
| National Disadvantaged pupils | 0.3 | 0.2 | 0.2 | 0.4 | 2.3 | 0.9 | 34.8 | 0.0 | 0.3 | 11.1 | 10.2 | 60.7 |

* These qualifications are not recognised in the performance tables of school accountability

| Number of Entries | Computer Appreciation / Introduction (CN1) | | | | | | | Information & Communications Technology (CJ) | | | Computer Studies / Computing (Computer Science) (CK1) | Total |
|----------------------|--|-----------------------------|-----------------------------|------------------------------|------------------------------------|-------------|------------------|--|------------|------------------|---|-------|
| | Functional Skill at Entry Level | Functional Skill at Level 1 | Functional Skill at Level 2 | OCR Cambridge National Award | OCR Cambridge National Certificate | VRQ Level 1 | VRQ ECDL Level 2 | ELQ Band B | ELQ Band C | GCSE Full Course | GCSE Full Course | Total |
| All pupils | 15 | 8 | 5 | 11 | 28 | 23 | 219 | 8 | 1 | 362 | 333 | 1013 |
| Disadvantaged pupils | 11 | 5 | 3 | 5 | 6 | 3 | 95 | 6 | 1 | 99 | 88 | 322 |

Source: National Consortium for Examination Results provisional KS4 2017 results.

4.7 Clarification

A qualification is assigned a discount code on the basis of the subject area it covers. The purpose of a discount code is to group qualifications with similar content together allowing comparisons to be made between qualifications with the same discount code. The discount code is also used to only count the results of a single qualification for each subject area in a school's results. Generally for each subject area no more than one qualification would be taken by a student. Comprehensive lists are not available for qualifications that are not counted in the performance tables for school accountability. These other qualifications are most likely to be taken by pupils with special educational needs.

<https://www.gov.uk/government/publications/key-stage-4-qualifications-discount-codes-and-point-scores>

4.8 Boys and Girls

There is a significant concern both nationally that too few girls are taking up the Computer Science (GCSE) exam. In 2016 they made up just 20% of entrants, while the figure for ICT has been around 40%. This is mainly due to the image of the subject with "Many girls believing computer science and coding is 'for boys' and they do not see desirable career options that appeal to them."

Cellan-Jones, R. (2017). *Computing in schools - alarm bells over England's classes. 2017*, from <http://www.bbc.co.uk/news/technology-40322796>

This is also the case in Brighton & Hove. Analysis of the data shows that more boys were entered for Computing GCSE than girls in 2017.

| | Number of entries to Computing GCSE (discount code CK1) | Number of pupils in cohort | Percentage of the cohort |
|-------|---|----------------------------|--------------------------|
| Boys | 271 | 1167 | 23% |
| Girls | 62 | 1035 | 6% |
| Total | 333 | 2202 | 15% |

4 Source: National Consortium for Examination Results: National Pupil Database KS4 2017 results.

- Fewer girls than boys were entered for GCSE ICT subjects. Compared to the national pattern more girls were entered for GCSE ICT subjects.
- Compared to the national pattern more disadvantaged pupils were entered for GCSE ICT subjects.
- More pupils with middle and high prior attainment were entered for GCSE ICT subjects than national.
- Attainment was above national in computer studies / computing GCSE but below in information and communication technology GCSE.

Subject: Computer Studies /computing /Exam GCSE Full course 310 - 2017

Disadvantaged pupils GCSE Computing 2017

| | NOR | NOE | % gaining A*-C | % gaining A*-G | Avg points |
|-------------------------|--------|-------|----------------|----------------|------------|
| National (state funded) | 142512 | 14514 | 42.5 | 88.9 | 3.2 |
| LA (State funded) | 560 | 88 | 45.5 | 86.4 | 3.2 |

Boys GCSE Computing 2017

| | NOR | NOE | % gaining A*-C | % gaining A*-G | Avg points |
|-------------------------|--------|-------|----------------|----------------|------------|
| National (state funded) | 269118 | 53372 | 56.4 | 93.1 | 3.9 |
| LA (State funded) | 1167 | 271 | 62.7 | 95.2 | 4.1 |

Girls GCSE Computing 2017

| | NOR | NOE | % gaining A*-C | % gaining A*-G | Avg points |
|-------------------------|--------|-------|----------------|----------------|------------|
| National (state funded) | 259953 | 13419 | 61.3 | 93.6 | 4.2 |
| LA (State funded) | 1035 | 62 | 61.3 | 98.4 | 4.4 |

4.7.1 Apprenticeships and other post 16 pathways

The Brighton & Hove City Council IT & Digital and Digital First teams currently employ a number of apprentices in disciplines ranging from IT security to software development, network engineering and desktop support. Several of the current apprentices joined the team on Level 2 apprenticeship programmes, and

have since gone on to higher apprenticeships at Level 3 or above. Three IT&D team members recently enrolled on a Digital & Technology Degree apprenticeship in Network Engineering, a part time course over 4 years leading to a BSc (Hons), and another member of staff in Families, Children & Learning is doing a degree apprenticeship in Data Analytics.

At least five members from IT&D's permanent staffing who originally joined as apprentices have since been successful in applying for professional roles in the department, and a further four members of staff who have joined staff apprenticeship programmes alongside their existing roles. The team also supports the recruitment of IT apprentices to work in schools.

4.7.2 Our Future City

Our Future City has five strategic goals, of which one is focused on developing digital skills. Through this goal we aim to develop children and young people's 'digital skillfulness' – their ability to apply digital skills through competencies, behaviours and practices that can enhance their lives positively, confidently and safely.

Brighton & Hove is recognised as a hub for creative and digital industries: with creative, design and IT firms growing faster here than the local and national economy¹. This creates significant opportunities for our children and young people. By focusing on both creativity and digital skills, Our Future City is working with young people and partners to create pathways to skills development and employment opportunities.

To date this work has included:

- A new partnership with The RSA to develop a prototype for Brighton & Hove to be a pilot 'UK City of Learning' – exploring the benefits of a digitally-connected city for self-managed learning.
<https://www.thersa.org/discover/publications-and-articles/reports/cities-of-learning-prospectus#>
- Working with partners including Brighton Digital Festival to create a youth-led conference that engages with young people and the digital sector to explore existing employment opportunities and to begin visioning digital jobs of the future.
- Working with partners across the city to support young people to develop digital skills through programmes such as Maker Club's BrightSparks.
- A focus on 'digital wellbeing' through professional development for teachers, arts and cultural practitioners including training and networking events delivered in partnership with South East Dance and Artswork.

5 WHERE NEXT?

5.1.1 Following on from the conference the Schools ICT team has designed a survey for school staff to find out what their needs are in computing and the support /

¹ www.brightonfuse.com (2014)

training that they would find most effective. When the results are collected and analysed, this will lead to a revised programme of support for school staff.

- 5.1.2 There are further evening meetings planned by Raspberry Pi to increase the number of volunteers that might run coding clubs in more schools and meetings for coding club volunteers.
- 5.1.3 The ICT and Computing Consultant is researching materials and resources to support teachers and recommending some resources such as 'Purple Mash' (an award-winning website for primary school children). He is also working to review assessment in Computing in light of the changed curriculum expectations.
- 5.1.4 The Schools ICT team is developing a bid for a project to promote continuity of computing experience from primary to secondary school and to raise enthusiasm for Computing in girls.
- 5.1.5 Promote the partnership meetings and the computing hubs, which are good platforms for teachers to share their best practice and create learning communities.
- 5.1.6 Greater involvement with events such as the Digital Learning Festival which runs workshops for children and young people will promote the subject to all pupils.
- 5.1.7 Strengthen links with other organisations, such as Block Builders (who have built a 3D model of the Royal Pavilion using Minecraft and work with schools on planning projects based on their locality) and code club.
- 5.1.8 Develop links with and use the resources of the Universities and other organisations to further support computing.

6 ANALYSIS & CONSIDERATION OF ANY ALTERNATIVE OPTIONS

- 6.1.1 The role of the ICT and Computing Consultant could be expanded to do more work to support schools, but it is determined by the buy back from schools which determines the amount of work that can be done in this area. It is hoped that the development of the Computing Hubs and the self-improving school system will ensure that provision is made for pupils to develop computing skills.

7 COMMUNITY ENGAGEMENT & CONSULTATION

- 7.1.1 There is a survey of all school staff taking place.

8. CONCLUSION

- 8.1.1 The changes to the National Curriculum have changed the expectations for teachers in Computing. There is a range of provision in place, including training

for teachers, Coding clubs running in schools with pupils and there is further development planned.

9. FINANCIAL & OTHER IMPLICATIONS:

Financial Implications:

- 9.1.1 There are no direct financial implications for the council as a result of the recommendations in this report. Schools have delegated budgets and will use them to support their pupil's curriculum activities. Some also run after school clubs for computing and may charge for this or offer it for free.

Finance Officer Consulted: Andy Moore

Date: 16/11/17

Legal Implications:

- 10.1 There are no legal implications arising from this report.

Lawyer Consulted: Serena Kynaston

Date: 17/11/2017

Equalities Implications:

- 11.1 It can be the case that girls engage less with computing and not all young people across the city have access to computers. Many schools have homework clubs and the option for pupils to use computers out of lesson time.

Sustainability Implications:

- 12.1 Good computing knowledge can help young people connect with each other and source information and resources. This is balanced with being mindful of e safety and the implications of fast moving technology that makes equipment redundant.

Any Other Significant Implications:

- 13.1 None

SUPPORTING DOCUMENTATION

Appendices:

1. None

Documents in Members' Rooms

1. None

Background Documents

1. None

Appendix 1

Crime & Disorder Implications:

- 1.1 Ensuring that pupils are successful at school is likely to lead to employment.

Risk and Opportunity Management Implications:

- 1.2 Schools that do not deliver the new curriculum well are at risk of falling results at GCSE and less positive judgement at inspection.

Public Health Implications:

- 1.3 appropriate use of computing can support engagement with community and society and this wellbeing, but also has risks in terms of children becoming too sedentary and the potential for cyber bullying which would threaten their wellbeing.

Corporate / Citywide Implications:

- 1.4 This report contributes to the priorities of children and young people achieving well and a vibrant community

