

Ict analysis and evaluation report

Technology



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Information and Communication Technology plays an important role in modern teaching and learning. Using ICT has a relatively short history in education. It is quite likely that when the parents of our present pupils were at school the only example of the product of modern technology they have used was a simple calculator. But just as the technology in the world around us developed it became increasingly important to use more and more sophisticated ICT equipment in education and to teach our pupils how to use it appropriately.

The more traditional ICT equipment, such as TV and Video, is used in Mathematics not quite as extensively as in other subjects such as History for example. Mathematics is a very practical subject; it is more important to be able to solve problems, to use acquired skills, rather than just remember a piece of information. Nevertheless there are some revision programmes that could be used perhaps not to replace the teacher but to give an extra dimension and variety to the lesson. As a part of the preparation for the Key Stage 3 SAT tests I have used short revision programmes with Year 9 class.

Other ICT equipment, such as calculators, is being continuously used in teaching mathematics. Virtually every lesson, unless its objectives are teaching specific mental arithmetic techniques, simple or scientific calculators are being used. Simple calculators are used to speed routine calculations in numerous topics from calculating areas and volumes of shapes to solving problems involving percentages, from calculating averages in statistics to solving quadratic equations in algebra. On some occasions the objective of the lesson could be how to use scientific calculator effectively.

I have been involved in teaching a Year 9 group a series of lessons on using brackets keys on scientific calculator, used calculators in teaching operations with fractions and directed numbers for Year 7 group and observed graphics calculators being used in teaching straight line graphs to Year 8 class.

Calculators allow pupils to do routine calculations quickly and concentrate on the methods of solving problems. Using such ICT equipment as graphic calculators with children as young as 12 could allow them to finish an investigation in a couple of lessons which otherwise would have taken them a few weeks.

On the other hand children like using new technology and would be much more motivated to work with graphic calculators than with standard pencil and graph paper methods. Calculators could also support children who have difficulty with such arithmetic techniques as long division and long multiplication. When pupils are using calculators they could concentrate on learning new methods of solving different problems rather than to be presented with the similar multiplication or division tasks over and over again.

Another ICT equipment, which is widely used in teaching mathematics, is computers and various software programs. The most commonly used programs in many schools are LOGO, Omnigraph, Spreadsheets and short game-like tasks like SMILE programs. I have used Omnigraph in teaching Year 10 class properties of curved graphs and graphical methods of solving simultaneous equations. I also used Excel spreadsheets when investigating number sequences with year 8 group and used LOGO as an aid in recurring worms investigation with year 7 class.

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I also used Smile programs on several occasions. The main advantage of using programs like Omnigraph is the time factor. During the 35 minutes lesson pupils were able to investigate a considerable amount of graphs, which would have taken them much longer time otherwise. At the same time pupils were getting instant feedback. They were asked to predict the behaviour of particular graphs and were able to check immediately if their predictions were correct. Another powerful tool of the modern technology is the Internet.

I have used Internet extensively as an aid to the lesson preparation, but pupils could also use it as a resource for their investigations. Most schools do not have an easy access to the Net for all the pupils, but usually information could be downloaded to the network where it could be much more accessible. The important issue closely related to working with ICT is how to use it effectively. The majority of ICT equipment, especially modern computers and software, are expensive and as all schools have limited resources, it is important to use them effectively to provide the best possible ICT teaching.

It is much more efficient to use a class set of graphic calculators with special OHP calculator used by the teacher than just one or two PC per class, which would be comparable in price. There is an opinion that the future in using ICT in teaching mathematics lies not in using computer classes but in using interactive whiteboards in every lesson. Personal computers are excellent resources but by their very nature they are best used for individual independent learning, not in class situation.

In my experience in working in computer classes the teaching plans had to be adapted in such way that the pupils could follow instructions on the specially prepared worksheets individually. The role of the teacher was to check that everybody understood what is required and offer individual help. I found it difficult to bring all the class together and to keep attention of the whole group of the pupils in computer class. At the same time the advantage of using computers in teaching mathematics is that they could support differentiation.

Firstly computers could be used for producing different work for pupils of different abilities such as separate worksheets with larger fonts, worksheets with tasks of different difficulty depending on the ability and the level of attainment of each particular pupil. Sometimes it is enough to provide pupils who are having difficulty drawing tables, sets of axis etc with ready-made printouts so they would not be left behind and could produce a good quality piece of work. Another opportunity is offered when pupils are working individually or in pairs on separate PCs.

Not only pupils could be using different worksheets with tasks of different difficulty but they could be using different programs as well. Often work done using computers is an open-end investigation so every pupil could be following their own investigation at their own speed. On the market there are numerous software packages designed to support teaching mathematics. While there is a basic set of programs, which have been used for years in many schools, they might be outdated as computer technology is aging very quickly.

The software used in schools should be if not identical then at least compatible with the ones pupils (and teachers) might be using at home. Certain software is designed to be used as a revision and would be suitable for independent use either at home or in an after school home work club rather than in class. Depending on the type of software used the continuous assessment of the pupils progress could be built into it. Some programs, rather like games, would not allow you to move on the next level before completing the task.

In that case it is easy to assess pupils on the basis of the level of difficulty achieved. Such programs also give pupils instant feedback and therefore involve them instantly and deeply in the process of learning. ICT is being extensively used in teaching mathematics. The development of the confidence of pupils in using ICT is one of our objectives. Mathematics is closely related to ICT and provides a basis for it. Quite often schools are relying on teachers of mathematics to give initial lessons in computer literacy.

Such programs, as Excel for example, were originally designed not as aid in teaching mathematics are being widely used for many mathematical investigations. On the other hand I have observed such mathematical software as LOGO used by ICT teachers. While teaching mathematics we have an opportunity to introduce different types of ICT into learning. ICT provision in schools is constantly developing; the level of ICT competency that is required from our pupils is constantly increasing. Schools and teachers should look ahead and be prepared for adequate teaching of ICT of the future generations.