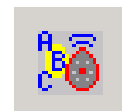




# Report for FLaT on the Use of Interactive Computer Driven Whiteboard with 5-14 Curriculum



Signature	Signed on behalf of
	Neilston Primary School
	East Renfrewshire Council



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## SUMMARY

The main idea behind this project was to challenge the existing teaching methods used at Neilston Primary School by allowing the development of computer-based packages of lessons to deliver the 5-14 curriculum. To this end we used an interactive whiteboard with 'vote pads' to produce a set of work packages to cover various subjects in the curriculum.

We also felt it was important to encourage the interaction of the children and to use visual and audio stimulation. As part of the work packages we wanted to provide a way of assessing the class and individual pupils understanding of the curriculum. We were also keen to encourage staff to share resources, ideas and produce work packages that could be used by others.

We feel that all the above objectives were achieved and the pupils and the staff readily adapted to these new approaches to deliver the curriculum. The pupils found it enjoyable and seemed to concentrate harder and for longer. All pupils seemed to respond well to using the 'vote pads' and some pupils who did not readily respond to traditional classroom methods willingly participated in using the 'vote pads'. Boys in particular liked the 'vote pads'. The 'vote pads' also allowed the staff to gather evidence and assess how the class and individual pupils had understood the lessons.

The main difficulty we faced was that the work packages that we generated took us longer to develop than we initially anticipated for various reasons that are discussed in the main document.

Although more evaluation is needed, the results we have seen so far would seem to indicate that there are advantages in this type of delivery of the curriculum, and, in particular, the ease of assessment and the participation of more pupils.

We at Neilston Primary intend to build on this project, through coming sessions, to deliver the 5-14 curriculum.



## 1 INTRODUCTION

### 1.1 Background

1.1.1 In October 2004, Neilston Primary School was awarded a grant from FLaT (Future Learning and Teaching) to investigate the use of an interactive computer driven whiteboard to deliver the 5-14 curriculum. The grant was for £11,970 and the project was to be completed by June 2005.

1.1.2 The project made use of the existing whiteboard and software (ACTIVstudio V1.9.3 with ACTIVote) already installed in the school ICT Suite.

1.1.3 The project purchased additional devices (namely 16 voting pads) to be used with the ACTIVote software to allow pupils to respond to questions set by teachers. The devices also record the pupils' responses and allow the responses to be saved and stored on the school network. The principal part of the project concentrated on the use of the ACTIVote devices (hand held vote pads).

### 1.2 Report Overview

1.2.1 As part of the above project this report was produced to record and pass on information learned, our conclusions, areas to be addressed and next steps.

### 1.3 Report Structure

1.3.1 Section 1 outlines the history of the project and the structure of this document.

1.3.2 Section 2 looks at the rationale for the project and its intended outcomes.



- 1.3.3 Section 3 discusses what we did. This includes how we selected and developed our work packages.
- 1.3.4 Section 4 covers the way we assessed the impact of the project through observation and feedback from questionnaires. Both pupils and staff were consulted.
- 1.3.5 During the project we had to overcome a number of problems. Section 5 details the problems we encountered and where possible our solutions.
- 1.3.6 Section 6 contains findings and conclusions of the project.
- 1.3.7 Finally Section 7 contains the issues that have to be addressed and our next steps.



## 2 RATIONALE AND INTENDED OUTCOMES

### 2.1 Rationale

- 2.1.1 The rationale behind the project was to seek to challenge existing teaching methods employed at Neilston Primary School, which deliver the 5-14 curriculum by allowing the development of computer-based packages of lessons. We wanted to try to stimulate more pupils and involve them in active participation of lessons. We especially wanted to see if we could involve pupils who did not readily respond to existing methods, but not at the expense of losing those who currently do respond.
- 2.1.2 We believe that much of the time spent writing on the blackboard reproducing existing material is wasted. This is because once the board is wiped all information has been lost and will have to be regenerated. Time should be used more productively to ensure pupils fully understand the material that is being presented rather than in the regeneration of the material itself. The generation of these computer based work packages should address these issues.
- 2.1.3 We also wanted to see if we could provide timely and accurate feedback on the level of understanding of the lessons by each individual pupil or by the class as a whole. To this end we wanted to provide a way of asking questions and gathering and recording the results so that formative assessment could take place.
- 2.1.4 We wanted to encourage teachers to develop and challenge their own teaching skills and to share and re-use material.
- 2.1.5 Essentially we wanted to make learning more challenging, entertaining and exciting for both pupil and teacher

### 2.2 Intended Outcomes

- 2.2.1 The intended outcomes were as follows:



- Selected teachers to become trained and gain confidence in the use of the interactive whiteboard and 'vote pads'. In addition, the teachers were to employ their teaching expertise to allow them to develop new ways of presenting the curriculum in an innovative manner.
- Various work packages were to be produced that covered different subjects at various stages in the 5-14 curriculum.
- Results from 'vote pads' were to be gathered and stored. These results will be used for formative assessment of individual pupils.
- A Teachers' Pack was to be produced which covered guidelines, new techniques to be used, training tips, problem areas & their solutions and examples of the work packages that were produced by the project. The Pack was aimed at allowing staff not originally involved in the project, to come up to speed quickly and to serve as a reference that was not covered by any other document.



### 3 WHAT WE DID AND HOW WE DID IT

#### 3.1 Project Team

3.1.1 At the start of the project we needed to select the teaching staff that would be involved in the project. We decided to include staff with a range of experience including newly qualified teachers, experienced teachers and teachers from the Senior Management Team. The staff selected had indicated a desire to develop their ICT skills. In total seven teaching staff were identified. The staff thought it would be better if they worked in pairs so that they could discuss ideas and bounce ideas off each other. Because there was an odd number of teachers involved one teacher worked on their own.

3.1.2 An IT Consultant was also part of the Project Team. The remit of the Consultant was to assist the teaching staff where necessary and resolve technical issues with ACTIVStudio and the 'vote pads'.

3.1.3 It was hoped that the multi-disciplined Project Team would allow imaginative and innovative approaches to learning and teaching using the interactive whiteboard and 'vote pads'. It was also hoped that the work packages produced would be practical and be used to deliver the 5-14 curriculum.

#### 3.2 Choice of Work Package Topics

3.2.1 We then agreed that we would cover a range of subjects including Environmental Studies, Topic work on Neilston and Victorians, Maths, Language, Science, Weather. The subjects would be aimed at various stages from P1 through to P7.



### 3.3 Generating Work Packages

- 3.3.1 Initially we looked at the ACTIVStudio software and found that the training we had had was not enough to enable us to generate lessons. There were various reasons for this. Some of us had not had any training. Because we did not have whiteboards in our classrooms and had been unable to use them on a regular basis, the benefits of the training that some of us had received had been lost over time. (This is still a problem and is covered in Section 7.) The training we had received was aimed at showing us the software tools and not at how we could use these tools to produce usable lessons. We decided at this point that the IT Consultant should be used to provide some of this training and that we should write down our findings in the Teachers' Pack.
- 3.3.2 We looked at ACTIVStudio and ACTIVote and came up with some approaches that we thought would be interesting. These approaches are covered in the Teachers' Pack.
- 3.3.3 Teachers then came with their ideas on what they wanted to do and then tried to implement their ideas using these approaches. The trick was to make the lesson more dynamic - not to think of the whiteboard as only a blackboard or a book or a worksheet. Although we did use some sound we found that the subject choices we made were not enhanced by using sound so we did not make much use of this facility.
- 3.3.4 We always provided assessments/check-ups in the form of multiple-choice questions. Sometimes the work packages did not cover lessons and were only used for assessment purposes.
- 3.3.5 To gather the answers to the questions we used the 'vote pads'. There were a number of problems setting up the 'vote pads' but after workarounds were found, the 'pads' themselves proved reliable. However some of the software that uses the 'vote pads'



has bugs in it. Details of the workarounds are contained in the Teachers' Pack.

- 3.3.6 The results of an assessment will be influenced by the probability that a pupil can guess the correct answer. The 'vote pads' allow a minimum of two answers and the maximum of 6 answers per question. In order to minimise the effect of guessing we decided to use questions with as many answers as was practical.
- 3.3.7 We also discovered that considerable thought and care was needed when generating the questions and their multiple choice answers. We had to be careful about the wording of the question and make sure that the use of images did not mislead them. Because the questions were now in a multiple-choice format it was necessary to come up credible alternative answers to test their understanding. The drawback of this type of question was that there is a chance that the pupil may guess the correct answer and there is no way of capturing the pupils' reasoning/working for their answer.
- 3.3.8 Where possible the work packages or part of the packages were shown to the pupils. The pupils and staff evaluated the packages using questionnaires and observation. Some of the results from the evaluations have been fed back into some of our work packages.
- 3.3.9 We also translated Mental Maths questions into multiple-choice questions and we will use them for progress testing for P2, P4 and P6. These will also allow us to do comparisons with different years.



## 4 IMPACT/ASSESSMENT OF PROJECT

### 4.1 Qualitative Rather Than Quantitative

4.1.1 At the outset of this project, in our FLaT proposal, we said it would be difficult to quantify the impact. The quantitative impact will be better judged over a period of years especially when you can repeat assessments and compare expected results with actual results. Our assessment of the impact of the project is therefore qualitative. This is based on observation, experience and responses to questionnaires. The questionnaires and their results are stored in the Project File at Neilston Primary School. Some of the results of the questionnaires were gathered using the 'vote pads'!

4.1.2 Our assessment of the project is extremely favourable. However it would remiss of us not to take into account that the novelty value is very high at the moment. The extent to which our finding and conclusions will be affected when the novelty value wears off is difficult to assess at the moment.

### 4.2 Pupil Questionnaire

4.2.1 Various questionnaires were generated for pupils. The styles of the questionnaires were different because they reflected the stages that the pupils were at. The questions were kept simple. The pupil questionnaires were generated as multiple choice questions in flipcharts and the pupils were asked to answer the questions using the 'vote pads'. The results of the pupil questionnaires were recorded and stored in spreadsheets so that we could compare them easily. Pupils from P1, P2, P4 and P7 took part in the questionnaires.

4.2.2 The results, although generalised, can be summarised as follows:



- The vast majority enjoyed using the 'vote pads' - not having to write is always popular!
- The vast majority thought their lessons were more enjoyable and exciting
- The vast majority found the 'vote pads' easy to use - especially those that found using a pencil difficult

### 4.3 Staff Questionnaires

4.3.1 The staff questionnaire was paper-based and consisted of twenty-one questions. An explanation for their answer to each question was also required. The results of the questionnaire could not be gathered using the 'vote pads' as there is no way to capture the explanations. Each member of the teaching staff involved in the project filled in the questionnaire.

4.3.2 The results, although harder to generalise than the pupils' results, can be summarised as follows:

- Using 'vote pads' allowed results to be gathered which class teachers and the Senior Management Team could use in formative assessment of individual pupils.
- Results provide accurate feedback on pupils understanding of the subject thus allowing teachers to identify any problem areas and address these areas quickly
- All teachers felt that pupils who did not readily respond to conventional teaching methods did respond enthusiastically to these new approaches.
- Most teachers perceived an improvement in pupils' concentration and interaction.



- All teachers agreed that the novelty value was playing a part in the favourable response of the pupils.
- All teachers agreed that it was too early to tell if pupils' understanding of lessons had been improved.
- All teachers enjoyed the project as it developed their skills further and allowed them time to interact with other teachers and share ideas and views.

#### 4.4 Impact on Staff Development

4.4.1 According to the results from the staff questionnaires, all staff have found the project enjoyable and challenging and they feel that their ICT skills had been developed further. They all wish to continue to develop these skills further. All of the staff stress that it is important to use these skills regularly otherwise their skills diminish over time.

#### 4.5 Impact on Using Multiple-choice Questions

4.5.1 Some thought will have to go into assessing the results of using multiple-choice questions. This area has not been addressed in this project other than to note that it is an issue. Note that to minimise its influence the maximum number of answers (six) should be offered where possible. Care is also needed when generating the questions in the first place.



## 5 PROBLEMS ENCOUNTERED AND THEIR SOLUTIONS

### 5.1 Building a Bank of Resources

5.1.1 We found it very time consuming generating work packages that did not use the resources supplied in ACTIVStudio. It should be noted that ACTIVStudio is aimed at English and Welsh schools so we did not always find what we were looking for within ACTIVStudio. To save time in the future and to encourage sharing, we decided to start to build a bank of resources for the school. The bank contains images and sounds. The bank is located on the school network so that all staff can access it and put more things in it. The bank can be used for things other than generating work packages in ACTIVStudio.

### 5.2 Sharing and Re-using

5.2.1 A requirement of the project was to make the work packages reusable and sharable. The way ACTIVStudio is set up on the school network does not allow us to easily share work packages or access these work packages from other PCs. We therefore asked for an area to be set up on the school network so that we could store our master work packages on. This allows the packages to be shared and accessed by all. We also had to develop a way of making the work packages usable for other teachers. To address this we put instructions on how to use the package (in the form of teachers' notes) into each work package and also developed a naming convention for each work package file. Please refer to the Teachers' Pack for details.



## 5.3 Training

5.3.1 The effectiveness of previous training had been eroded over time so we re-trained and have produced a Teachers Pack. This goes some way to solving this problem but it will only be solved by providing teachers with whiteboards in their classroom so that they can use them on a daily basis. See Section 7.

## 5.4 Software Problems

5.4.1 There were various problems with the *ACTIVStudio* and *ACTIVote* software. These problems are addressed in the Teachers' Pack. A solution was found to most of the problems. The areas that we could not find solutions to were avoided.

## 5.5 Multiple-choice Questions

5.5.1 Questions can only be asked in the form of multiple-choice questions with a minimum of two answers and a maximum of six. This means that a pupil can guess the correct answer. If you use the maximum six answers this influence is kept to a minimum. Careful wording of the question and possible answers are also needed to ensure the pupils understanding is tested. The drawback to this type of questioning is that there is no way to record the pupils reasoning. Results must therefore be interpreted carefully.



## 6 FINDINGS AND CONCLUSIONS

- 6.1 This section contains the findings and conclusions of the project.
- 6.2 We found that work packages could not be generated in odd hours here and there. The best results were obtained from spending two whole consecutive days generating the packages. Staff also worked better when paired together and could bounce ideas off each other.
- 6.3 Pupils from P1, P2, P4, P6 and P7 have used the whiteboard and the vote pads and all seemed to enjoy the experience. They concentrated well and responded favourably.
- 6.4 Pupils had no problems using the pads and understanding the relationship between the options on the board and the buttons they had to press. The buttons on the pads are in capital letters but some of the options to the questions were given in lowercase. This did not cause them any problems.
- 6.5 During a session with P2 there seemed to be a certain amount of competition going on to see who could answer the quickest. The children could see when they and others had pressed a button because it was displayed on the board. (It does not tell them whether their response is right or wrong, only that they have pressed a button that is in the correct range of given answers.) Whether this causes a problem in assessment may need to be addressed as you are looking for correct answers rather than the fastest to answer. Conversely, it was interesting to note that some pupils in P6 were having a competition to see who could be the last to answer questions!
- 6.6 The recording and collating of the results has proved to be very useful. As colour is used to distinguish between right and wrong answers the teacher can quickly see which questions have caused



problems and which children need extra help. An overall pattern can be easily seen.

- 6.7 As the results can be saved we have a recording of each pupil's responses to each question as well as a way of referencing the questions. This gives a means of providing formative assessment on an individual basis.
- 6.8 The automatically recording and marking of questions saves the teacher time, as they no longer have to do it. The marking is also consistent.
- 6.9 Gathering and storing responses to questions using the 'vote pads' assessed pupils who do not readily respond to traditional methods. We therefore have evidence of their ability, which had previously been difficult to obtain. These pupils now become easier to assess.
- 6.10 As the only way to ask questions is by using multiple-choice, thought will have to be given to the influence of the probability of getting the questions correct by means of guessing! The other drawback of this type of questioning is that there is no way to gather the pupils working on how they arrived at the answer.
- 6.11 Although there have been a number of teething problems, workarounds have been found. Both problems and workarounds have been documented in the Teachers' Pack.
- 6.12 In conclusion the vote pads seem to have been well received by both teachers and pupils. They have proved useful and reliable (although there are some software bugs). It is the intention of the school to continue to use these devices for assessment and check-ups. The results will be stored and assessed by class teachers and the Senior Management Team to confirm and maintain progress of individual pupils or where necessary ensure additional support is put in place.



## 7 ISSUES TO BE ADDRESSED AND NEXT STEPS

### 7.1 Move to ACTIVStudio2

7.1.1 ACTIVStudio2 is the successor to ACTIVStudio. Promethean, the makers of the software, no longer support ACTIVStudio. It is therefore important that we change to ACTIVStudio2. It should be noted that the project would have used ACTIVStudio2 at the outset but there were problems running it on the school network. These problems were not resolved until late April 2005 at which point it was felt that it was too late to change.

7.1.2 Although we have not used ACTIVStudio2 a great deal, we already know there are some new features in ACTIVStudio2 that will enhance our work packages. We also know that some of our problems will be resolved with ACTIVStudio2. However we are aware that ACTIVStudio2 will cause us some problems, as we know that it does not support the flood-fill facility from ACTIVStudio. There may also be other problems that we are not aware of. What we do know is that some of our work packages will have to be changed.

7.1.3 As a result of moving to ACTIVStudio2 our Teachers' Pack will have to be updated. At this point we are not sure how much effort will be involved in making these changes because we have not fully assessed ACTIVStudio2.

### 7.2 Address Equipment Shortage

7.2.1 In order to build on from this project in the most effective and efficient way we need to address the issue of equipment shortage. It has already been stated in this report that teachers need to use the interactive whiteboard on a regular daily basis just to maintain

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their expertise, never mind build on it. It is therefore important that each classroom has the appropriate equipment namely interactive whiteboard, projector, PC connected to Internet and the ACTIVStudio2 software. At the time of writing this report the school only has 2 interactive whiteboards set-up and working. One is set-up in the CPD Suite (shared by all classes) and the other is in an extension area shared by 4 classes. (The school has fourteen classes!)

- 7.2.2 It may not be necessary to have 'vote pads' for each pupil in every class but it will be necessary to have enough 'vote pads' for each pupil in a class. We therefore need to investigate the possibility of purchasing another 16 'vote pads' which would then allow us to assess a complete class at a time. It may also be beneficial to have some more 'vote pad' receivers so that the pads could be used in some classrooms. (The 'vote pads' can only be used in the CPD Suite at the moment because we only have one receiver.)

### 7.3 CPD

- 7.3.1 We plan to continue to build on from this project particularly in the area of CPD. All the teachers involved in the project and some that were not have expressed an interest in developing their interactive whiteboard skills further. We also plan to generate more flipcharts and gather more resources in the form of images, sounds and video clips that we can share with others.

### 7.4 Passing On Our Findings

- 7.4.1 We plan to disseminate our findings to other members of our school staff who have not been directly involved in this project. In part this will be done through the Teachers' Pack but we also hope to use CPD time to demonstrate our work package and in particular the results that can be gathered from the 'vote pads'.



7.4.2 We will also pass over our work packages to East Renfrewshire Council so that they can be put them on the ERC intranet. This will enable teachers from other schools to use them. It should be noted that there might be licence issues to be addressed. This is because we used some images from other software packages in our work packages. Although the software licences cover Neilston Primary School it is unclear whether others can use these images without them holding their own licence.

## 7.5 Interactive Whiteboard Web Sites

7.5.1 As interactive whiteboards are used more and more in school environments more information is available on them on the Internet. A number of areas on web sites have been created which provide information on interactive whiteboards and also provide free downloadable flipchart lessons. We hope to investigate these sites further and assess their suitability for the delivery of the 5-14 curriculum. We would then identify the most useful lessons and the years they apply to. This will allow us to build up a bank of sharable flipchart resources without the need to spend time developing our own when it is not necessary. As part of this activity we would inform all staff members of our findings and draw their attention their existence in the resource bank.

## 7.6 Integrate 'Vote Pad' Results Into Tracker

7.6.1 We have a school database tracker that records each pupils' formal assessments, progress tests and standardised tests. It may be useful to look at ways of entering the assessment results from the 'vote pads' automatically into the tracker.