EFFECTIVE TEACHING AND LEARNING

PROJECT REPORT

NR DC

Using voting technology for assessment

Sally Betts and Maria Kambouri

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National Research and Development Centre
for adult literacy and numeracy

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AND LEARNING:
DEVELOPMENT
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This is one of several linked publications arising from the five Effective Practice Studies carried out by the National Research and Development Centre for Adult Literacy and Numeracy (NRDC) from 2003 to 2007. The five studies explored effective teaching and learning in reading, writing, numeracy, ESOL and using ICT.

NRDC has produced three series of publications from the Effective Practice Studies: the research reports, published in February 2007; the practitioner guides, published in partnership with NIACE in Autumn 2007; and the development project reports, published in Autumn 2007. For titles in the first two series, please see the back cover.

These development project reports focus on specific elements of effective classroom practice in these areas:
• Oral reading fluency in adults
• Collaborative writing
• 'Bestimation': Using basic calculators in the numeracy classroom
• Using voting technology for assessment
• Reflection and action in ESOL

Contents

Introduction

This paper presents an account of a small action research and development project which was carried out as a follow up to the Effective Practice Study in the use of ICT (Mellar et al. 2007). The project explored the use of voting technologies to undertake assessment activities in family literacy and numeracy classes. Voting technologies or voting systems (VS) are portable interactive audience response and electronic voting tools used in meeting, training, and research applications.

Much of the assessment undertaken prior to the project was either paper-based or through question and answer. We were looking for a non-threatening, quick way to deliver assessments that,

if at all possible, could also be fun. The ability of ICT to motivate adult learners, both to enter learning and to stick with it, has often been discussed (Mellar et al. 2001; Kambouri et al. 2002; Mellar et al. 2004). However, 'traditional' digital technologies, such as the desktop computer, may well be losing their appeal. We were therefore keen to explore the motivational impact of a variety of technologies, such as mobile phones, tablets and digital video, and now voting technologies, as well. For this reason we selected voting technologies and we hope that this guide will allow other tutors to learn from our experience.

PHOTOGRAPH COURTESY OF JO DUCKETT

Reflective practice and action research

The project was based around our own reflective practice. The model we followed was to review our current practice, identify elements that needed improvement and select one; then to find an alternative method, pilot it, evaluate it and make appropriate changes before finally rolling out with other tutors. This process is also known as action research for practitioner-led research (see Carr and Kemmis 1986).

There have been many projects (see NRDC website) recently supporting teachers to improve their teaching and develop their professional skills through a cycle of self-reflection, change of practice and re-evaluation through peer observation and use of reflective diaries. Examples include a series of numeracy projects recently completed in Scotland (Coben et al. 2005 and 2007).

In order to capture their personal development and reflection, the tutors involved in this project kept a blog which they decided to share. This allowed us to learn from each other and provide peer support. The blog detailed what was tried, how it went and any issues that occurred. It became an ideal place to ask for help. For instance, Elaine posted a message about maths terminology, and the problems associated with 'yes/no' answer questions in learner self-assessment. This was discussed and as a result, it helped us think about the way we needed to pose questions to ensure learners were not confused by the question or terminology used.

Resources

Three members of staff worked on the project: Jo Duckett and Elaine Husselby, both experienced family learning tutors teaching literacy and numeracy courses, and Sally Betts, who led the pilot and acted as a mentor to the others. Full support was given by our Family Learning Manager, Anne Cassidy, who ensured we were timetabled in such a way that we could provide peer support in the classroom whilst we gained confidence with the technology.

In order to carry out the project, a set of voting technologies were required. The voting technologies selected were CLiKAPAD handsets together with ppvote software (www.clikapad.com; www.ppvote.com).

The resource which belonged to our Family Learning Team had not been used since purchase. The system has a set of 30 handsets and a base unit, together with software that operates within PowerPoint, having its own toolbar. The handsets are small, about the same size as a basic calculator. In selecting these, we hoped that learners would have instant familiarity with the technology and so hopefully remove any anxiety they might have. As tutors delivering in different school locations, portability was essential. In addition, a laptop and digital projector were used.

Initial exploration

We started by reviewing our current practice and identified our main area of need for improvement to be our assessment methods. Whenever paper-based assessments are used with learners, we could see their attitudes change instantly, most not wanting to take the assessment because of their poor literacy skills or previous negative experience. As tutors, we knew how essential it was to undertake initial assessment but in doing so we did not want to disengage the learner, especially not in the first week, when they were more likely to drop out of the class and not return. It is for this reason that we opted for the trial of voting technologies as an alternative means of delivery.

We decided that the areas we would need to reflect on were as follows:

- **Would the use of the technology actually change the way we teach?**

- **Would it provide a more effective means of measuring the progress of our learners?**

- **Would it prove to be an efficient method for us in terms of time to create assessments, analyse results and transport the equipment?**

- **Would it provide a non-threatening means of assessing learners?**

Training and support

The technology was new to all of us and it was important that we felt confident in its use before taking it into the classroom to use with learners. We spent the first term learning how to use the technology and to undertake a pilot. This also provided the tutors with sufficient time to produce assessment materials that would be suitable for their learners.

The pilot was delivered by Sally, shadowed and supported by Jo. Jo then went on to develop assessments in collaboration with Elaine. Jo and Elaine co-delivered the assessments initially, until they felt confident enough to continue on their own. This only took two weeks. Peer support was provided via the blog or the telephone, once we were actually delivering courses. This mentoring and support proved really valuable in building our confidence and in producing collaborative assessments.

The pilot

A pilot was held with a short 12-hour intensive numeracy course, delivered over four weeks. The course was held in a primary school and the learners were parent/carers of children attending the school. Their aim was to learn how they could support their children with their school work, so their focus was not necessarily the development of their own numeracy skills on joining the course.

The voting technologies were used at the beginning and end of every session with the same test being delivered on each occasion. The first test was to undertake an initial assessment of the topic to be covered during that session (measure shape and space, data handling, basic number calculations, fractions and percentages); and the second one to see if learning had taken place. The final assessment on the fourth week not only assessed learning for that session but also reviewed learning over the whole course (satisfying the need for ongoing assessment as part of the learning process). We selected questions that had posed a problem during the initial assessments in the previous weeks, to find out if the learners had not only learnt but had retained knowledge throughout the course. The children were in the classroom each week for the second assessment and they were given a handset so that they could join in.

Figure 1. Example of a question and group answers on a graph
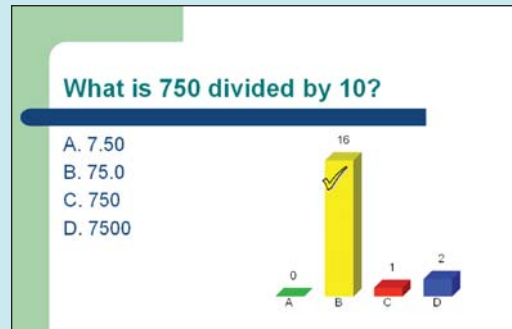
Questions and results

Prior to any assessment, we made it clear to the learners that they were not to confer over answers. After each of the questions, the learners were always shown the class results on a graph and the correct answer was highlighted (see Figure 1). This led to learners chatting and laughing between questions, making the assessment process more relaxed and positive. Where a question was answered incorrectly by the majority of learners, we would go on to cover that topic in more detail during the session.

The opportunity to see the answers during the test actually fostered a form of peer support during assessment.

The assessment data provided within the software was exported to Excel spreadsheets and group results were stored in a PowerPoint presentation. This provided us with evidence of progression and achievement for each learner which could then be highlighted with them.

Evaluation of the pilot

We found that the instant results did indeed inform the lesson that followed. In some cases, learners asked questions during the assessment itself, providing us with opportunities to reinforce learning at those points. We also found that we were more able to observe learners during the assessment. This provided us with a lot of information about our learners and we could then go on to provide additional support during the lessons to those identified as needing it. The instant results together with learner observations allowed us to change what we actually delivered in the sessions, putting more focus on the identified areas of weakness. The instant information and the fact that we did not need to hand-mark individual assessment papers were of huge benefit.

The assessments definitely showed learners' progress, although we learnt during the pilot that we needed to be careful when creating the questions and to consider doing things such as shuffling the questions if the assessment was used more than once. We also found it essential to keep clear records of the assessments and of which learner had which handset.

The pilot certainly showed us that using voting technology was an easy way to capture results and that the learners enjoyed using the technology. The learners required little help in handling the equipment and seemed much more relaxed throughout the tests.

The creation of assessments did take quite a lot of time but we felt that this was probably because using the software was so new to us and that it would get easier with further practice. Although the children were unable to answer every question in the assessments, we observed their parents offering strategies to help them get to the correct answer.

> Using the handsets with learners the first time was a bit worrying as I didn't know how well they would be received. However, as soon as the first assessment finished, a parent said 'that was great fun, are we going to use them again?' and there were lots of comparison with the programme Who Wants to Be a Millionaire. Because they quickly realised they were not going to be identified individually when the results were shown, any inhibitions they may have had initially had dissipated.

> As a tutor I also think when using written tests I'm inclined to hand back the marked papers to the class without going through them question by question, except reviewing questions that a lot of the learners get wrong. Having used the handsets, I now realise what a mistake this was. The amount of discussion that occurred as result of seeing the answers and actually hearing what they had done to get to the answer provided me with valuable information to help learners understand questions better and to encourage peer learning.

Next steps

It was concluded that the voting technology in the pilot had certainly proved to be of benefit to both the learner and the tutor and so it was agreed that we would now trial the technology in our other courses. Four groups were selected: three short 12-hour intensive courses (two numeracy and one literacy) and one long 60-hour numeracy course. The schools involved in this stage of the project were both primary and junior. In total, 39 learners took part in the project (including the pilot).

Findings following the roll-out

Most of our findings from the roll-out mirrored those of the pilot:

Throughout the roll out we asked our learners how they felt about using the technologies and the vast majority were very positive, saying they would rather undertake assessment by this method than a paper-based test. This was an interesting outcome and particularly important for one of our learners who suffers from multiple sclerosis. As tutors we observed a much more relaxed atmosphere in the classroom and lots of peer support between questions.

Learners' comments on using voting technology in the classroom

> I enjoyed using the voting handsets as I have MS and I found it easier than writing. The computer handsets were easier for me as I find it difficult to write on occasions.

> I enjoyed using the voting handsets – it was a refreshing way to learn and assess my skills/knowledge.

We did find that our learners had reservations about the use of the technology for accredited assessment. Their main concerns were not being able to go back to review any questions which they had been unsure about.

Learners' comments on using handsets in a formal exam setting

> I would feel more comfortable doing it on paper, just to check my answers.

> Paperwork would be better for me because I could look at the question again. Apart from that I wouldn't mind if I could go back to check my answers – it would be a good idea.

We did not time the tests, although the software provided this functionality. We made the decision to move the assessment on to the next question once all the learners had voted. However, we experienced a problem when one learner took far longer than her peers to answer the questions. The other learners did not comment, but you could see the frustration on their faces. We discussed this issue and made the decision to stick to non-timed tests, but to tell learners when we were just about to move on to the next question to avoid long delays between questions.

The amount of information we gained delivering the tests was far above our expectations. As the learners looked up at the screen, not down at paper, we were able to see their reactions and note how long they took to answer individual questions. All this information is unavailable with paper-based tests.

Writing the questions is definitely a skill that we all improved on during the course, but logistics and transportability are still issues for our team.

Using pictures to add interest or presentation on question slides is time-consuming and it made no difference with learners when they weren't used, but saved us a considerable amount of time.

Disadvantages - it's heavy and bulky to carry; and secondly, we are both teaching at similar or same times and it is difficult to transport the equipment.

IMAGE COURTESY OF CLIKAPAD

Lessons learnt

Action research is an ideal way to introduce a new method of teaching into your teaching practice. It takes you through a set model that requires constant reflection and evaluation. It means that you have all the benefits of working in collaboration as a team: peer support, exchange of ideas and discussions around issues. It means that decisions are made and implemented with the team's full support.

Reflecting on your teaching practice is so important in order to develop and improve. It is essential to reflect when implementing a new method of teaching, in order to determine if it is effective and of benefit to the learner.

The assessments may take a long time to produce initially, but they are re-usable. A way to reduce time is to create an assessment that covers the whole course and simply hide unwanted questions in the individual sessions.

Have a practice question for learners who are using the handsets for the first time before you actually start the assessment. This provides the opportunity to explain exactly how the technology and software work.

Being able to analyse results quickly and export them to Excel has been of great benefit.

Ensure that you explain to learners that only they and the tutor will be aware of how they answered.

If the software does not work as you expect it to, seek advice early.

Have spare batteries for the handsets.

Watch your learners whilst delivering the assessment, you will learn so much.

The issues of transporting and sharing the technologies across the team is something that need to be considered carefully. For example, buying more than one base unit would allow a set of handsets to be split between tutors.

If asking questions that require a number answer, make sure that you use alphabetic labels e.g. a) 3, b) 4 as this reduces the chance of learners becoming confused.

Plan sufficient time to use the software, make assessments and become confident in using the technologies. Set up peer support mechanisms.

Conclusions

The use of the voting technology has altered the way in which we now teach. It has given us the opportunity to deliver our sessions at the point of assessment. We may now use the instant information we gain, through observation during the assessment and the displayed results, to guide how we deliver the session. We are now able to spend more time on those areas of identified need and to provide additional support to those learners struggling with the topic.

This technology has proved to be an effective method of measuring the progress of our learners. It has provided a means of capturing data in a quick and efficient way. However, we still have work to do in this area in order to find out how we can allow learners to review questions and change their answers once the class has completed the whole assessment.

Assessment time is far more flexible and has been positively accepted by our learners, who found VS easy and fun to use. In particular, we consider using VS to be a more effective method of delivering assessments to learners with some forms of learning disabilities.

The use of the technology certainly fosters peer support and peer learning very early on in a group, inspiring those involved to experiment with the technology and to work through issues in order to fully explore how the technologies could impact on teaching practice.

Some definitions

Voting technologies, or voting systems (VS), are portable interactive audience response and electronic voting tools used in meeting, training, and research applications.

A **tablet PC** is a notebook - or slate-shaped mobile computer. Its touchscreen or digitalised tablet technology allows the user to operate the computer with a stylus or digital pen, or a fingertip, instead of a keyboard or mouse. The computer is linked to a network using a wireless or wired link.

A **blog** is a website where entries are written in chronological order and displayed in reverse chronological order. Blogs provide commentary or news on a particular subject. 'Blog' can also be used as a verb, meaning to maintain or add content to a blog.

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Mellar, H., Kambouri, M., Logan, K., Betts, S., Nance, B. and Moriarty, V. (2007) *Effective teaching and learning: Using ICT*. London: NRDC. Available at: www.nrdc.org.uk/publications_details.asp?ID=87 Further information and resources

Further information and resources

CLiCKAPAD handsets: www.clickapad.com

ppvote software: www.ppvote.com

For more practitioner research projects see: www.nrdc.org.uk/content.asp?CategoryID=512&ArticleID=338

Notes

Other publications from the NRDC Effective Practice Studies

The **research reports** – available in full or summary formats from **www.nrdc.org.uk/publications**

Effective teaching and learning: Reading
Effective teaching and learning: Writing
Effective teaching and learning: Numeracy
Effective teaching and learning: ESOL
Effective teaching and learning: Using ICT

The **practitioner guides** – available from **www.niace.org.uk/publications**

Developing adult teaching and learning: Practitioner guides - Reading
Developing adult teaching and learning: Practitioner guides - Writing
Developing adult teaching and learning: Practitioner guides - Numeracy
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