



Assessing the feasibility of using digitised British Sign Language examination papers for deaf candidates in Scotland

**Report to:
Scottish
Qualifications
Authority**



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Report to Patricia MacDonald, Scottish Qualifications Authority
from the Scottish Sensory Centre, University of Edinburgh

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Executive Summary

The aim of this project is to assess the feasibility and benefits of SQA adopting a system of centrally produced, standardised digital examination papers with added British Sign Language (BSL) translation of the written questions so that deaf students would not be disadvantaged by variable levels of local translation. The outcomes of the study are summarised as follows:

1. Earlier work done showed clearly the signing skills of Teachers of the Deaf are very variable and few are qualified as signers to the minimum level deemed necessary by a number of organisations for deaf people. From this work there is also evidence of teachers confessing to a lack of confidence in their ability to deliver signed exam papers to pupils. This study also produced evidence of pupils being put off by their perception of weak signing skills of teachers.
2. Work done through the BSL Science Glossary project is considered by deaf pupils and teachers to be of great benefit to learning and the glossary forms an essential foundation for the BSL translation of exam papers.
3. It became apparent during the study that the Chemistry and Biology glossary required the addition of new terms, and their definition, which underlines the fact that the process of compiling a glossary will require on-going work as new exam papers are produced. 450 new signs were developed to enable the trial examinations to be completed as part of this project.
4. The skills and experience developed by the BSL Glossary teams also forms a key building block in taking forward standardisation of BSL translation of examinations in subjects where there is a need to further extend the glossary.
5. The project has enabled the technical aspects of producing BSL translation to digitised exam papers to be better understood and refined. Three papers have been produced – Intermediate 1 Biology, Standard Grade Biology (Credit) and Intermediate 1 Chemistry.
6. The experience of the trial shows clearly that a process for BSL translation of exam papers would require the following:
 - a comprehensive glossary of BSL signs in the particular subjects being available in advance to deaf pupils and their teachers
 - the translation team being composed of a subject matter expert who is thoroughly familiar with the BSL glossary for that subject; a signer who has high level skills in using the appropriate BSL glossary; is also competent in setting up the signing environment for accurate filming of

the translation and has the necessary expertise for accurate editing of the translation to match the examination requirements.

7. It proved impractical during the trial to determine a standard time for translation of the three exam papers trialled. The time required will reduce as glossaries expand and familiarity with the processes increases. Times are going to be variable depending to the nature and extent of questions in each subject exam. The report shows an indicative time of 7 person-days for translation of one of the exam papers trialled. This included the time required to produce the additional signs required for the exam paper. It is estimated that if this additional work had not been required the task could have been completed in 4 person-days.
8. Twenty-nine people from 6 schools were involved in this project.
 1. 14 pupils, 12 teachers, 1 BSL tutor and 2 classroom assistants.
 2. Auchmuty High School, Calderside Academy, Dingwall Academy, Donaldson's, Gourock High School and Grange Academy.
 3. 10 pupils participated in the trial.
 4. 4 pupils from Calderside Academy went through the paper with their teacher and gave feedback.
 5. 8 teachers were interviewed.
 6. 2 classroom assistants and one BSL tutor were interviewed.
 7. 4 teachers of the deaf observed and gave feedback.
 8. 6 pupils from 3 schools looked at Intermediate 1 Biology.
 9. 5 pupils from 2 schools looked at Intermediate 1 Chemistry.
 10. 3 pupils from 3 schools looked at Standard Grade Biology (Credit).
9. Before the trials, each school was advised to make sure that their computers have the latest version of Adobe Reader (version 9 or more) to enable the electronic paper to work properly. Pupils and teachers were also given a weblink to the SSC BSL Glossary website to look at the draft signs developed in 2010 in preparation for these exams. Pupils conducted the trial in an exam-like condition. On completion pupils were then asked for their feedback and this was recorded by a member of the project team. After this, the pupils were asked to complete further feedback using the 'yellow box' to test the suitability of this system for use in recording candidate responses in the future.
10. The results indicate that pupils and staff involved in this project would welcome the introduction of electronic examinations with BSL video clips and they would like still to be able to choose which method of support. The pupils are confident and feel more independent when using the electronic paper with BSL video clips. All found it easy to learn how to use the electronic paper. Nearly everyone thought the new format is very good or excellent. They all thought the translation was very clear and of high standard. Training and practice should be offered to the pupils before doing the real exams – such as creating a bank of digital past papers for schools and pupils to use for revision and practice.

11. Teachers and pupils wanted to be able to sign their answers via a webcam. We consider that the VOXUR software would be ideal for recording pupils' signed responses. This software allows for a review of response before saving. If answers require to be changed they can be re-recorded. At four schools visited, all pupils and teachers were enthusiastic about being able to record their own responses and play back almost immediately for them to review.
12. We recommend that SQA investigate with 55degrees Limited the development of the bespoke software using the yellow box (VOXUR) as a model with the pdf paper.
13. The project study has shown that it is entirely feasible to produce standardised BSL translations of examination papers for deaf pupils, providing there is available a glossary of BSL signs that is sufficient to match the content of the exam paper. Feedback from participants shows that this system would improve delivery of the exams to pupils, relieve pressure on teachers to produce sustained quality of signing and also reduce pressure on pupils through candidate autonomy.
14. The project is now at a stage where BSL translated examination papers in Chemistry and Biology could be introduced in 2011 at centres which volunteer to pilot this method. Further evaluation could then be carried out with a view to the system being introduced nationally from 2012. We hope that SQA may consider a widening of this trial to other subject areas, but this is dependent on finding additional funds from other sources for BSL vocabulary development and collection of subject specific signs.

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1. Introduction and project aims

The aim of this project is to pilot the use of digital examination papers in British Sign Language (BSL) so that deaf students could access BSL translations of the written questions and, if possible, record their answers in BSL.

The current practice for deaf students sitting examinations is that a member of school staff signs the question paper to them. This not only creates staffing and cost implications for the schools but also is likely to result in a lack of standardisation in the way the questions are asked. Creating a centrally produced examination paper in BSL would circumvent this issue and, with additional vocabulary resources, would provide schools and their staff with a useful tool with which to prepare their students for examinations.

The project work involved investigating the use of pdf format of examination papers, already produced by the SQA. Students accessed the BSL translations by clicking on an icon to open a pop-up screen of the BSL version for each question. We also investigated the feasibility of candidates recording their answers in BSL.

This project used a similar methodology to the CALL project (2004) to pilot digital examination papers. The method involved trialling existing papers with students who had taken them a few months earlier. For example, papers taken in May and June were then used for the pilot project in September, with the same pupils.

The project was run by the Scottish Sensory Centre (SSC), a Scottish Government funded national centre based within the Institute for Education, Teaching and Leadership, Moray House School of Education, University of Edinburgh. Its role is to provide continuing professional development for teachers of deaf or visually impaired children and for classroom teachers, assistants and parents.

Project team

The researchers involved with this study have worked as a part-time team together since 2007 on the Scottish Sensory Centre's BSL Glossary project.

Dr Audrey Cameron is a Deaf chemist and secondary teacher.

Gary Quinn is a Deaf linguist based at Heriot-Watt University.

Rachel O'Neill is a lecturer in deaf education at the University of Edinburgh and SSC.

The project team has had valuable assistance from Paul Nisbet of CALL Scotland, Barrie Barreto from the Moray House blended learning unit and Elizabeth Izatt of the SSC.

The project team was also fortunate that the BSL vocabulary team experts involved were highly motivated and worked together extremely efficiently.

BSL vocabulary team

Gary Quinn

Rachel O'Neill

Audrey Cameron

Gerry Hughes (Science Teacher, St Roch's Secondary)

Mark Fox (Chemistry researcher at University of Durham)

Claire Leiper (Biology degree)

Rob Rattray (Science Teacher, Warwickshire, England)

Janet Wardle-Peck (Primary teacher at Royal School for the Deaf in Derby)

Tania Allan (Zoology degree)

John Denerley (former Social Worker), now runs Galloway Wildlife Park

Derek Rodger (Science teacher at Oak Lodge for the Deaf, London).

Agreed project outcomes

1. Survey of the background to deaf students sitting exams in Scotland.
2. Development of vocabulary for Chemistry and Biology to allow for translation of the papers.
3. Translation of science papers to BSL.
4. Technical discussion on how to create digitised papers.
5. Investigation of a method of recording signed responses.
6. Opinions of teachers and students on digitised system, including technical implications for centres.

Timescale

The original timescale of the project was that the translation should be finished in August for trialling with pupils in September 2010. We aimed to report to the Deaf Review Group in September and present this report in October 2010. Unfortunately we were delayed initially by technical difficulties of inserting video clips into digital exam papers. Subsequently bad weather delayed visits to some schools to trial the papers. We were able to present an interim report to the Deaf Review group on 4th October 2010.

2. Background about deaf pupils and signed exams

2.1 Background to SQA allowing signed questions and responses

Dr Mary Brennan, the former Reader in Deaf Studies at the University of Edinburgh, worked closely with SQA to develop a new approach to deaf children's assessment in public exams. Her report to SQA, 'Fair Assessment for Deaf Candidates' (Brennan, 2000) made some ground-breaking recommendations. She argued that deaf candidates who use BSL were at a disadvantage if they had to write their answers in English, as deaf pupils who sign usually have very poor access to English. She proposed that SQA should set up a system of centrally translated exams in BSL, distributed on CD ROM to centres, and that pupils should be recorded in signing their answers.

Brennan's reasons for the proposals were:

- *it will allow the most accurate possible, prepared translations of questions to be used within the examination process;*
- *it will allow all d/Deaf candidates to be given the same questions - they will all sit the "same" examination;*
- *d/Deaf candidates will not be disadvantaged by the variable level of teachers' signing.'* (op.cit. p.84)

She also proposed that the centrally produced exams should be translated by qualified BSL/English interpreters (op.cit. p.108).

SQA accepted these recommendations and set up an interim system, because it was difficult to move straight away to Brennan's ideal proposal. From 2001 pupils were allowed to sign their responses, and over the period 2001-4 approximately 12% of deaf candidates took up this option. (British Sign Language & Linguistic Access Working Group, 2009,10.9.2).

However, we know that deaf candidates are not receiving the same level of interpretation of the exam papers in all centres. In 2007 Marian Grimes produced a report for SSC/National Deaf Children's Society (NDCS) and the Government's BSL and Linguistic Access Working group which surveyed the BSL skills of teachers and other staff supporting deaf pupils in Scotland. (British Sign Language & Linguistic Access Working Group, 2009, 7.1.2.1). This showed that only 8% had qualifications at level 3 BSL or above, the level regarded as the minimum by deaf organisations such as NDCS (2007), British Deaf Association (BDA) and the Scottish Council on Deafness (SCOD). Nevertheless, this low figure was an improvement on the 4% reported in 2003, suggesting that school services were training a minority of their staff to minimum levels.

SQA also set up a Deaf Review Group (DRG), composed not mainly of deaf people as the name might suggest, but of experienced teachers of deaf children who had good BSL skills, amongst them two Deaf teachers of deaf children, and a BSL linguist. This group meets regularly and reviews the video tapes/DVDs from centres with the translations. This quality control system has worked smoothly; members of the DRG point out to lead subject examiners if there are

any problems with a translation from a centre. SQA has provided advice for centres (SQA, 2010) entering signing candidates, particularly about how to use video successfully in the examination. This document does not mention the level of BSL needed by staff signing the question papers, and says that staff translating the responses should have 'the appropriate level of skill in signing' (op.cit.,p2).

Even with BSL level 3, approximately equivalent to Higher in a modern language, staff cannot necessarily translate accurately between English and BSL. Very few qualified interpreters work in the school sector (we know of three at present). The training course for teachers of deaf children does not include skills practice in translation, because the majority of trainee teachers of the deaf (ToDs) are only at level 1 BSL.

The low level of BSL skills amongst staff working with signing pupils meant that SQA could not instantly demand that only qualified interpreters do the translation work. Many teachers of deaf pupils feel unconfident about their signing skills. The system which SQA set up takes the pressure off them by videoing the pupil not the member of staff providing the translation. However, this means it is not possible to check the quality of the translation. Teachers and support workers only have an hour before the exam starts to prepare for this translation.

Brennan's report and the SQA initiative in the area of signed exams are in contrast to the approach of other exam boards in the rest of the UK. In England the Joint Council for Qualifications (JCQ) maintains the position that deaf candidates can have signed questions, but must produce their responses in written English (JCQ, 2008) or fingerspell/sign one-word answers. The JCQ guidance recommends the use of Sign Language Interpreters (2.8) but does not say these should be registered and qualified, implying that the usual class teacher can sign the questions.

Outside the UK, an experiment with signed exam papers for deaf candidates has been reported in Malta (Azzopardi-Alexander, 2008). In the United States, 20 out of 50 states have policies for the use of sign language in exams in 2003, 45 allowed sign interpretation of the test instructions, 13 allowed interpretation of the questions and 20 allowed interpretation of candidate responses (Clapper et al, 2005, Tables 1 & 3). However, Brennan's 2000 unpublished SQA report is much more detailed and analytical than other works on this topic and deserves a wider readership.

2.2 Vocabulary issues in deaf education and the SSC 2007 BSL Science Glossary project

BSL is a language with a rapidly growing vocabulary. Since 1993 when Disabled Students' Allowance was introduced in the UK, signing deaf students have been able to study at university level and have entered a much wider range of professional jobs than before. Working in new fields either with an Access to Work interpreter or in deaf work teams, new BSL vocabulary has been coined

so that the wide range of work issues could be discussed. Much of this specialist vocabulary is in use only amongst a small group of professionals and interpreters. However, some projects such as the Wolverhampton signs websites for Art, Technology and Science (see reference list) has made this vocabulary available on the internet. This has allowed teachers and Communication Support Workers to use technical BSL vocabulary consistently with their students. Previously they often made up a temporary arrangement between pupil and teacher which would of course vary from school to school. Very often these temporary signs had fingerspelling as their basis, i.e. principles borrowed from English rather than BSL.

During 2007 the SSC ran a project called the BSL Science Signs Glossary which established three working groups of deaf scientists and linguists to create and agree science signs in BSL. The SSC set up a bilingual glossary with the technical signs and definitions in BSL and English (SSC BSL Glossary website).

In the 2007 project, funded by the Scottish Government, the first phase was collecting technical terms in English from teachers and curriculum specialists. Then sub-groups of Deaf scientists or practitioners who had a particular subject interest were formed. For example on the Biology sub-group were three Deaf science graduates, two of them school teachers, a Deaf linguist and the manager of a wildlife park who had a great deal of experience with Biology in practical contexts. This group reviewed the signs which were already online at the University of Wolverhampton, and any other available source material. The sub-group created some new signs following the principles of BSL morphology and articulation, filmed them in draft and then via the SSC put them on a website so they could be reviewed by a wider group of teachers and Deaf scientists and linguists. Two of the team then produced BSL definitions for the agreed terms and these were translated into English. Finally the signs and definitions were uploaded, graphics or pictures were added, and for Chemistry lab videos were produced to show experiments conducted using the new terminology.

This first BSL Science Glossary project was well received (Wade, 2008) and led to a further evaluation project with Learning Teaching Scotland. For the evaluation phase, Dr Audrey Cameron and Gary Quinn interviewed deaf teenagers who had used the site and collected questionnaires from teachers. The results showed that the signs were valued, but that access to the signs was not always easy as it was within the SSC website. The research team found that the definitions in particular were valuable for students and teachers because they explain the concept and allowed for self-study (O'Neill et al 2010).

In February 2010 the BSL Glossary team led an SSC workshop raising issues about how to translate SQA exam papers (see website in reference list for further details, page 40). The day covered an introduction to the theory of translation, a discussion of the science glossary project and how technical vocabulary can be used with deaf learners, issues which arise for the translator in an exam situation and preparing pupils for signed exams. The participants were teachers of deaf children involved in translation of exams. Their comments

showed they welcomed the growth of technical vocabulary and advice from deaf teachers, who they previously had not had access to. At the end of the day they were more aware about the importance of giving choices to the candidates and practising signed exams from early on in the pupil's secondary education. Issues of Sign Supported English (SSE) and BSL were also discussed.

2.3 Recent research on teacher and candidate views about signed exam papers

Eileen Burns is a hearing teacher of deaf children with functionally fluent BSL who is also an associate inspector with HMIE. She was a member of the 2007 SSC BSL Glossary project and is now completing a Masters in Education on the topic: "*How can Scottish schools provide fair access to SQA exams for signing deaf candidates?*" Her research has involved interviews with many of the teachers who administer signed exams in Scotland as well as pupils who had recently taken their exams using sign. Eileen has kindly agreed to let us to view her data, although a detailed analysis will not be ready till her MEd is complete in August 2011. Eileen asked her participants if she could share the data with our research team. Common themes emerged from six interviews held with Communication Support Workers (CSWs), interpreters and teachers of deaf children.

Three of these six participants had not yet achieved BSL level 3. There was anxiety from most of the participants about their ability to translate well enough, particularly given the short amount of preparation time. This time varied according to institution. Participants who had better BSL skills were usually more concerned about their subject knowledge. Some centres had set careful preparation programmes in place to teach staff subject concepts and signs. Most participants felt that signing some questions would give the answer away, and the solution was to fingerspell. Some recognised that this would not be very helpful to students, while others had specifically taught both subject sign and English word during the course. Some participants reported that candidates did not want many questions signed. Discussing the reasons for this all agreed that it was a very pressurised situation for a deaf candidate to ask. Students varied about their confidence in asking for a question to be signed, signed again or to review their answer. Several participants saw the advantage of having a centrally produced paper but thought the vocabulary would take a long time to develop and standardise. Some participants were self critical of their signing skills while others were very confident. Generally speaking the members of staff felt they were giving a fair service. At one school in particular there was a lot of pupil choice available to choose the preferred CSW or teacher for the exam. One participant had not been able to access the SSC BSL Glossary website on a work computer and so this centre had made their own science signs material.

3. Adding additional technical signs to the glossary

We had anticipated the need to develop additional signs during the course of this work but had underestimated the amount of work that would be required for this. A great many new signs had to be created in order to be able to translate the papers appropriately. This had an impact on the timescale of the project. It also impacted on the number of the examination papers trialled as it was not possible to translate an examination paper unless the relevant vocabulary had already been developed. The number of completed translations was reduced from the target of 8 to a final total of 3 as a result of this.

The process of developing the vocabulary was a time-consuming one which consisted of three workshops in which a team of experts discussed and agreed on subject-specialist vocabulary. Separate workshops were arranged for Chemistry and Biology. A total of over 450 BSL signs were added to the existing vocabulary.

<http://www.ssc.education.ed.ac.uk/bsl/list.html>

The draft signs on the website above have now been refilmed and edited and are ready to be uploaded onto the main Glossary site. We are grateful to SQA for allowing us to significantly expand the number of terms available for deaf pupils in Chemistry and Biology.

4. Translating Biology and Chemistry science papers

Audrey Cameron and Gary Quinn translated three papers from English to BSL. When producing the BSL translations of each paper it was occasionally necessary to modify signs in order to match the context in which it was being used. The sign for DETERGENT was an example of this, where the generic sign was inappropriate in the context of the question which referred very specifically to washing powders.

Translation of the questions was initially slowed by the fact that the vocabulary was new to the project team and more thought and preparation was required in order to achieve the fluency required for the BSL translation. The translation was passed to Rachel O’Neill who reviewed them and the team discussed a few of the questions which we thought needed to be translated again.

It is difficult to work out the costs of translating future papers because this pilot involved more time as we were setting up new systems and finding the most efficient way of working. We know that it would be useful for SQA to have some idea of the time it would take to translate papers in future, so we include this approximate costing here.

Table 4.1: Example of costing the production of translating Chemistry/Biology papers

Production stage	Time	Number of people	Notes	
Vocabulary production	1 full day	3	This will reduce year on year	This would be 2 subject experts plus a BSL linguist.
Translation	1 day	2		
Quality check and refilming some questions	1 day	1	Likely to reduce as team becomes more experienced	
Editing and insertion to pdf paper	1 day	1		

It is not possible to determine a standard time for the production of exam papers. The time, therefore the cost, would vary according to the level of the exam, the number of questions and sub-questions and the length of questions. The cost is likely to vary considerably from subject to subject.

The example shown in Table 4.1 involving 7 person-days of work would cost £1400 at £200 days per person. However, the amount of vocabulary needed for a subject would reduce year on year as the project gathered or created new technical terms. There is no reason why this curriculum cost should ultimately be the responsibility of SQA. If the SSC can secure future resources to expand

the glossary then the number of person days for production and checking of an exam paper like the Chemistry and Biology ones would be four, or £800.

A sample of different exams was checked to see how many questions are in each paper and to see roughly how long it would take to translate. Students sat these exams in summer 2010 (Appendix A, page 42). We think it would be possible to work out a per question rate of translation, quality check and editing so that shorter papers such as Art could be costed in future.

5. Producing a digitised exam paper incorporating BSL

A high definition digital camera with a hard-drive was used to record the BSL clips for the digital examination papers. The BSL was filmed against a chroma-key background, using two spotlights in order to capture a good quality image. Additional equipment such as a tripod for the camera was also required for this process (see Appendix B for full list of equipment, page 47).



Figure 5.1: Gary translating a question in BSL from English

Different colour backgrounds were used for different subject papers help distinguish between them and also to test which colour was preferred.



Figure 5.2: Green background for Biology and blue for Chemistry

The recorded BSL was then edited on a Mac using iMovie software to create the short clips needed for each of the questions. The clips were then converted into MPEG-4 video format. The quality selected was 480x272 pixels which is the minimum suitable for viewing BSL without using excessive memory capacity.

Other movie formats (Flash, Windows Movie Maker) were tested prior to selecting MPEG-4 video as the preferred option.

The clips were then inserted into a PDF of the appropriate examination paper using Adobe Acrobat 9.Pro Extended software.

Video clips were minimised for pasting into appropriate sections of the paper so that they did not obscure any of the questions.

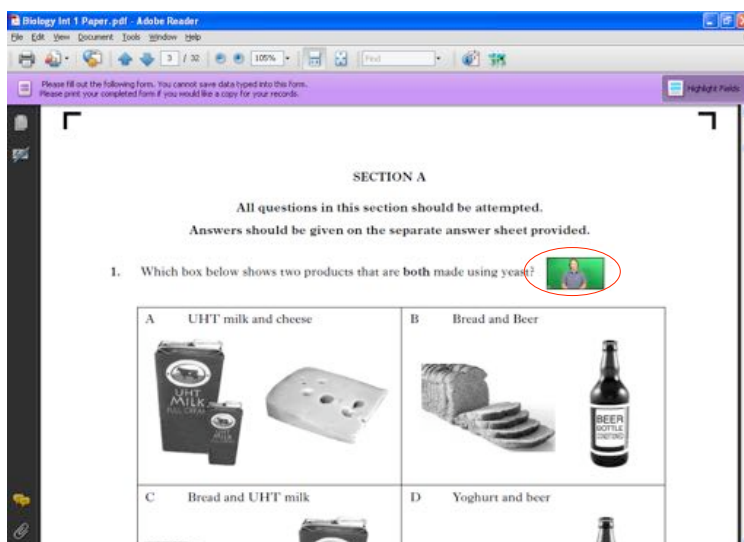


Figure 5.3: Video clips minimised to avoid obscuring the questions

When a clip is activated for play the video image becomes larger with the control bar showing whenever the cursor is moved over the image.

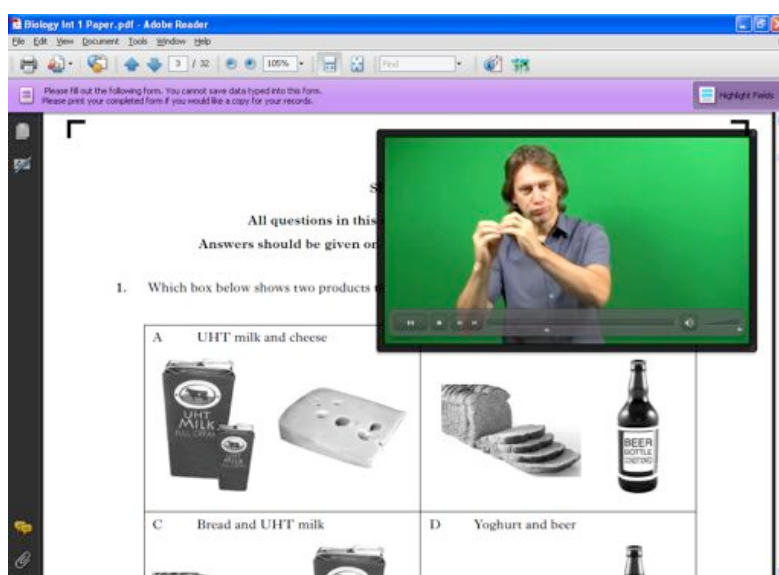


Figure 5.4: Video image being activated and control bar is showing

One minor disadvantage of using the MPEG-4 video format is that the 'close' 'x' button is difficult to see in the top right corner of the video image (Figure 5.5). This can easily be solved by ensuring that instructions on how to close the video are included in the signed rubric at the beginning of the paper.



Figure 5.5: 'Close' button at top right corner

The BSL digital papers take up a lot of memory capacity, for example the Intermediate 1 Biology normal digital paper uses only 2.2MB while the BSL version uses 345.4MB. The amount of space used by other subject papers might vary considerably with some taking up much less than this. Three examination papers were prepared in this way, Intermediate 1 Biology, Intermediate 1 Chemistry and Standard Grade Biology (Credit).

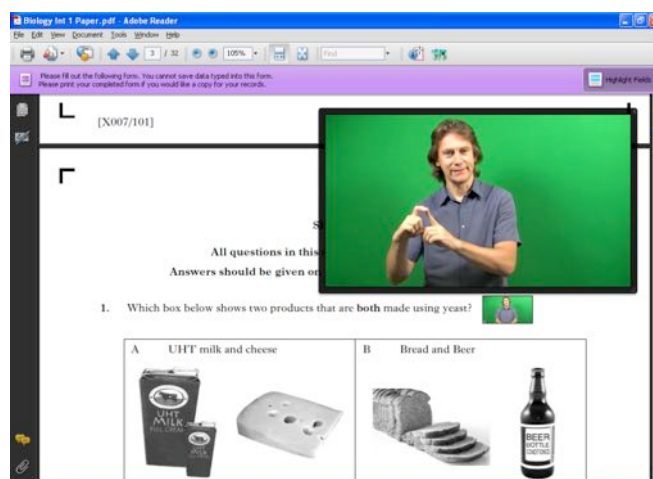


Figure 5.6: Intermediate 1 Biology

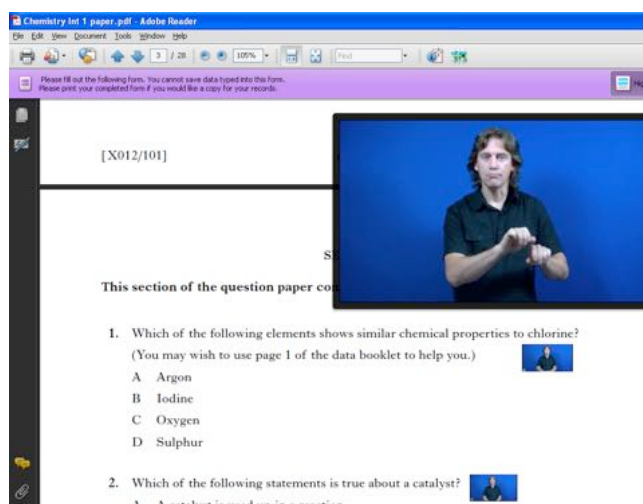


Figure 5.7: Intermediate 1 Chemistry

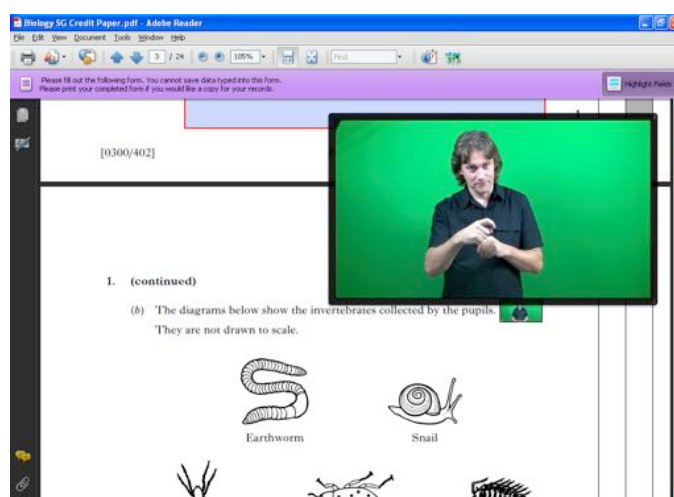


Figure 5.8: Standard Grade Credit Biology

The completed papers were saved onto a memory stick to facilitate easy upload to the various computers used by the candidates.

Prior to the testing of the examination papers the centres were informed of the technical requirements necessary, including a minimum of Adobe Acrobat 9 Reader. The papers were uploaded from the memory stick onto the computer the candidate would be using, and the trial of the papers was completed.

6. Feedback from schools

We used a similar methodology to the CALL Scotland project to pilot the translated digital examination papers. The aim was to have the papers tested by students who have already taken those examinations in May/June 2010.

This pilot exercise was a relatively informal one to elicit responses from the students about the format and presentation of the material. The students sat through the exam and tested the digital papers and then Gary, Audrey or Rachel interviewed the students and their teachers.

Schools and pupils

At the start of the project, with the data from SQA (Table 6.1), we identified 6 schools in Scotland that have deaf students who possibly sat SQA scientific exams in BSL in 2010. There were a total of 11 students, with a range of different school situations (specialist, mainstream and resource base). Because of the small number of deaf candidates involved, we also asked schools to include pupils from S3, S5 and S6 to test the papers.

Table 6.1: Entries for pupils who will have their science exam paper signed to them in 2010 – data provided by SQA

	School	Subject	Level	Number of students
1	Menzieshill High School, Dundee	Biology	Intermediate 2	1
2	Grange Academy	Biology	Intermediate 1	1
3	St Vincent's School for the Deaf	Biology	Intermediate 1	2
4	Calderside Academy	Biology	Standard Grade General & Credit	1
5	Donaldson's	Chemistry	Intermediate 1	4
4	Calderside Academy	Chemistry	Standard Grade General & Credit	1
6	Gourock High School	Chemistry	Standard Grade General & Credit	1

Note from SQA: The figures are always more than the number of pupils who want to sign their exams.

However, Gourock High School and Dundee City Council reported they didn't have any deaf students who sat the exams (in BSL) in 2010.

St Vincent's School for the Deaf has closed and the pupil is now based at St Roch's Secondary School in Glasgow, where we were able to conduct this interview.

We were expecting to visit an S5 student at Calderside Academy to try out the Standard Grade Credit Biology paper but she refused because she wanted to concentrate on her Higher prelims which is understandable. So a DVD with 3 BSL translated electronic papers (Int 1 Biology, Standard Grade Credit Biology and Int 1 Chemistry) and an evaluation form were sent to the pupils and teachers at this school (Appendix C: Evaluation form for pupils and teachers with DVD, page 48).

We also sent more DVDs with the evaluation form to teachers of Auchmuty High School and Gourrock High School who have experience in translating papers for their students in previous years.

At the SQA's autumn meeting of the signed transcription review group, we were kindly invited by Margaret Kinsman to visit Dingwall Academy for her S3 pupils to try them out.

School Visits

Before we could visit the schools, an ethics application form was submitted to Moray House Ethics committee for approval to interview deaf students about the BSL- translated digital exams. All the interviewers had Enhanced Disclosure and permission from the pupils and their parents were obtained (Appendix D: Consent forms, page 49).

Gary, Audrey and Rachel visited the following schools for the trials (November 2010 – January 2011):

- Grange Academy, Kilmarnock
- Dingwall Academy
- St Roch's Secondary School, Glasgow
- Donaldson's, Linlithgow.

Table 6.2: Trials of BSL translated papers by pupils

School	Subject	Level	Number of students
Grange Academy	Biology	Intermediate 1	2
Grange Academy	Biology	Standard Grade Credit	1
St Roch's Secondary School	Biology	Intermediate 1	1
Dingwall Academy	Biology	Intermediate 1	1
Dingwall Academy	Biology	Standard Grade Credit	1
Donaldson's	Chemistry	Intermediate 1	4
Total			10

Table 6.3: Feedback of BSL translated papers from teachers of pupils who did the trial

School	Staff role	Number of students
Grange Academy	Teachers for the Deaf	3
Dingwall Academy	Teachers for the Deaf	2
Donaldson's	Teachers and classroom assistants	6
Total		11

Table 6.4: Feedback of BSL translated papers

School	Subject	Level	Number of participants
Calderside Academy	Biology	Intermediate 1	2
Calderside Academy	Biology	Standard Grade Credit	1
Calderside Academy	Chemistry	Intermediate 1	1
Calderside Academy	Teachers for the Deaf		2
Gourock High School	Teacher for the Deaf		1
Auchmuty High School	Teacher for the Deaf		1
Total			8

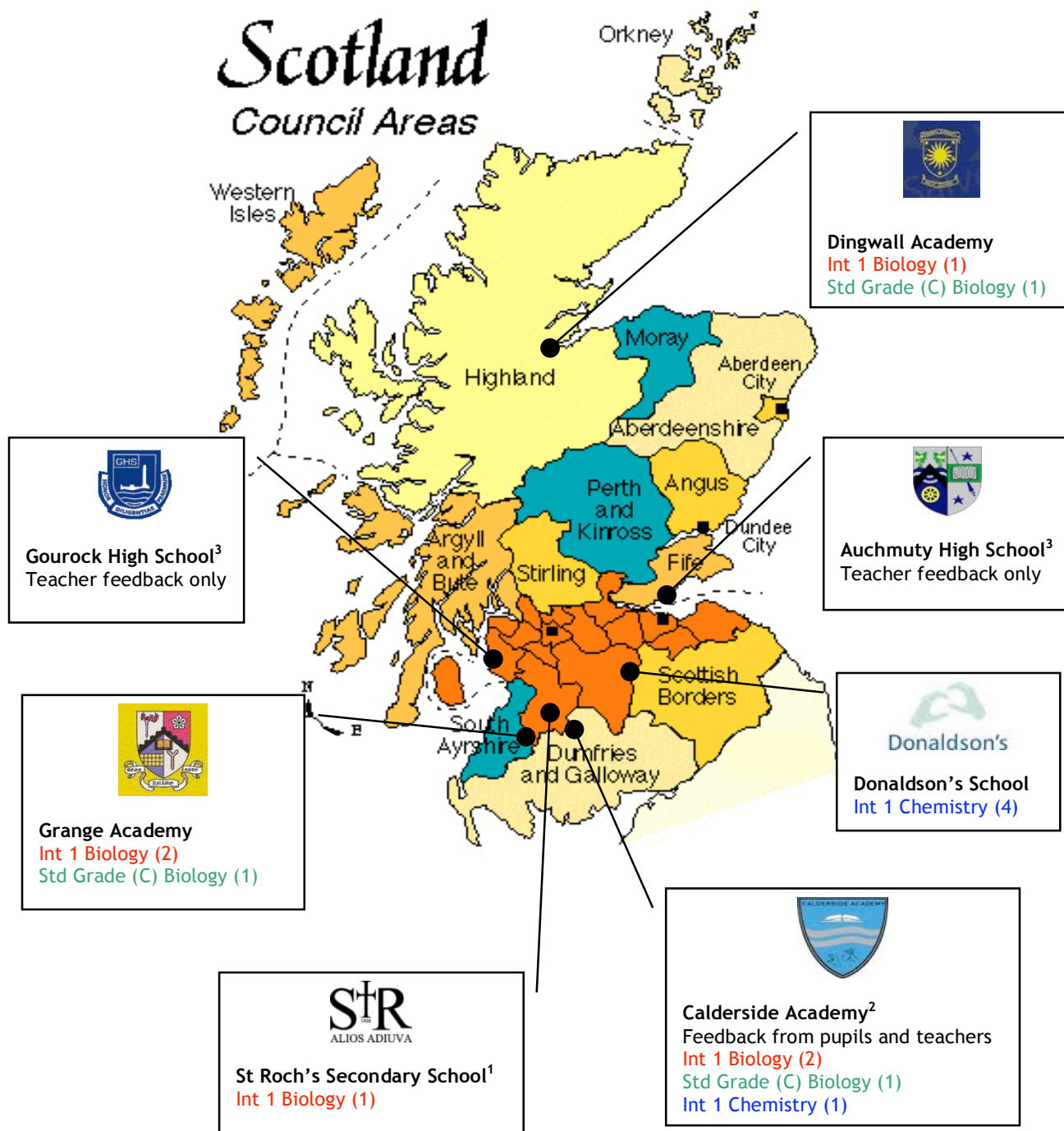


Figure 6.1: Schools in Scotland –involved in the SQA project

Summary of number of interviews and feedback

1. A total of 29 people looked at the BSL translated e-papers.
2. Ten pupils participated in the trial.
3. Four pupils from Calderside Academy went through the paper with their teacher and gave feedback.
4. Eight teachers for the deaf were interviewed.
5. Two classroom assistants and one BSL tutor were interviewed.
6. Four teachers for the deaf observed and gave feedback.
7. Six pupils from 3 schools looked at Intermediate 1 Biology.
8. Five pupils from 2 schools looked at Intermediate 1 Chemistry.
9. Three pupils from 3 schools looked at Standard Grade Credit Biology.
10. Only 4 pupils repeated the same exam as last year. Others will be doing the exams in 2011 or 2012.

Trial

Before the trials, each school was advised to make sure that their computers have the latest version of Adobe Reader (version 9 or more) to enable the electronic paper to work properly. Pupils and their teachers were also given a weblink to the SSC Science Glossary website to look at the draft signs developed in 2010 in preparation for these exams.

Pupils conducted the trial in an exam-like condition. Paper copies of the exam were provided because it is difficult to draw graphs or calculations on the computer without any training. At the start, we explained to the pupils how to use the e-paper by using the red boxes and all put their names, school and date of birth on the first page. We also told them if they did not understand any questions do not hesitate to ask us. This helped us to know which questions were not clear for them.



Figure 6.2: Pupils doing the trial.

We timed each pupil to see how long they did the exam (Table 6.5). All completed the exam either early or on time except for one pupil who is Deaf and autistic who took 2 hours to complete the exam (**DS4**).

Table 6.5: Summary of schools and pupils trialling the BSL e-papers

School	Student	Year	Done exam before?	Chem. Int 1	Biol. Int 1	Biol. SG Credit	Length of time/min	Result of exam done in summer 2010	Comments
Grange Academy	G1	S4	×		68%		90		Will be doing Int 1 Biology in 2011
	G2	S4	×		42%		60		Will be doing Int 1 Biology in 2011
	G3	College	✓			9%	40	Access 3	Left school in 2010
Dingwall Academy	DW1	S3	×			38%	35		Will be doing Standard Grade Biology in 2012. Not yet completed the curriculum.
	DW2	S3	×		40%		35		Completed only section A. Not yet completed the curriculum.
St Roch's Secondary School	SR1	S5	✓		52%			Grade B	Completed only section A because there was not enough time.

Donaldson's	DS1	S5	✓	72%			75	Grade A	Will be doing Int 2 Chemistry in 2012
	DS2	S5	✓	70%			80	Grade A	Will be doing Int 2 Chemistry in 2012
	DS3	S4	×	51%			75		Doesn't know the Int 1 curriculum as he is doing Standard Grade Chemistry (2012)
	DS4	S5	×	57%			120		Doesn't know the Int 1 curriculum as he is doing Standard Grade Chemistry (2012)

Code: G1: Girl, Deaf with CI and BSL, G2: Boy, Deaf with CI and SSE, G3: Boy, Deaf with deaf parents and BSL, DW1: Girl, Deaf with CI and SSE with speech, DW2: Girl, Deaf with CI and BSL, SR: Girl, Deaf with deaf parents and BSL, DS1: Boy, Deaf and SSE, DS2: Boy, Deaf and BSL DS3: Boy, Deaf with deaf parents and BSL, DS4: Boy, Deaf and autistic and BSL

Evaluation Questionnaire

On completion of the examination paper pupils were then asked for their feedback and this was recorded by a member of the project team. An evaluation questionnaire was used to answer a number of questions:

- How easy the electronic papers with the video clips to use are, compared with human interpreter?
- How easy was it to learn to use the electronic paper with video clips?
- Does the electronic paper with BSL translated videos offer more independence than interpreter?
- Would the pupils be confident using the electronic paper?
- How often do they ask questions or use the BSL video?
- Should SQA provide exams in the new format?

The evaluation questionnaire was completed by the interviewer (Appendix E: Evaluation Questionnaire, page 54).

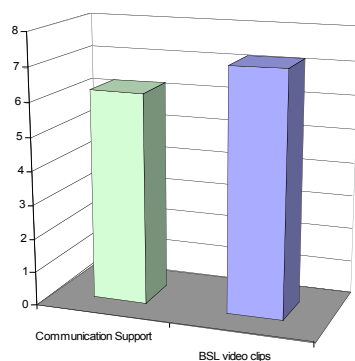
Marking of the papers

The papers were marked to see if the pupils were able to do the exam under different conditions (Table 6.5). The results will not be accurate because two S3 pupils were not able to complete the Biology exam because they have not yet completed the curriculum (**DW1 & DW2**). Two other pupils are studying for Standard Grade Chemistry and they did the Intermediate 1 Chemistry exam and still achieved a pass mark (**DS3 & DS4**). Pupils who have done the same exam last year achieved similar results with the electronic paper (**G3, SR1, DS1 and DS2**).

Results

1. How easy the electronic papers with the video clips to use are, compared with human interpreter?

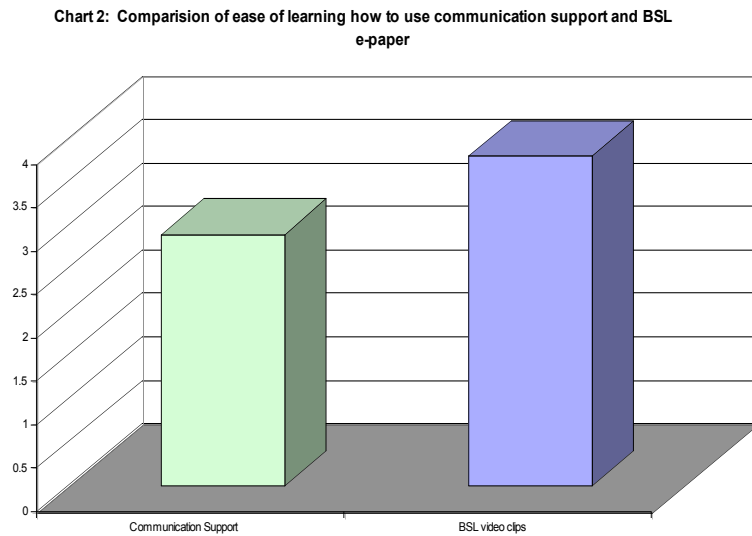
Chart 1 : Comparison of ease of use of communication support and electronic paper with BSL video clips



Overall, the pupils rate the ease of use of the electronic paper to be slightly higher than the use of a human interpreter. All pupils have been using communication support before for previous exams so they are used to having their support and know how to use them.

(1 = very hard, 10 = very easy)

2. How easy was it to learn how to use the electronic paper with video clips?



(1 = very hard, 4 = very easy)

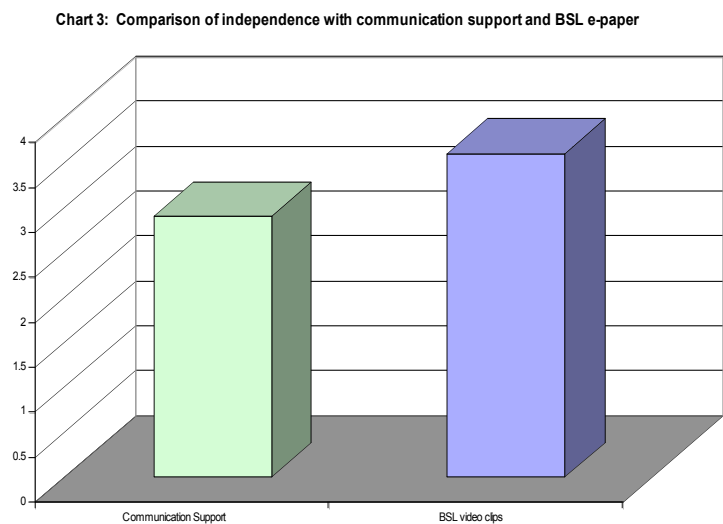
Overall, pupils found it easy to learn how to use the electronic paper with video clips. Most children are already technology confident so the pupils were able to proceed confidently and find their way round the electronic paper. We gave them few instructions on how to use the paper and they were very quick in learning. This is proven by the pupils' responses to the question.

3. Does the electronic paper with BSL-translated videos offer more independence than an interpreter?

Overall, pupils are feeling more independent with the electronic paper.

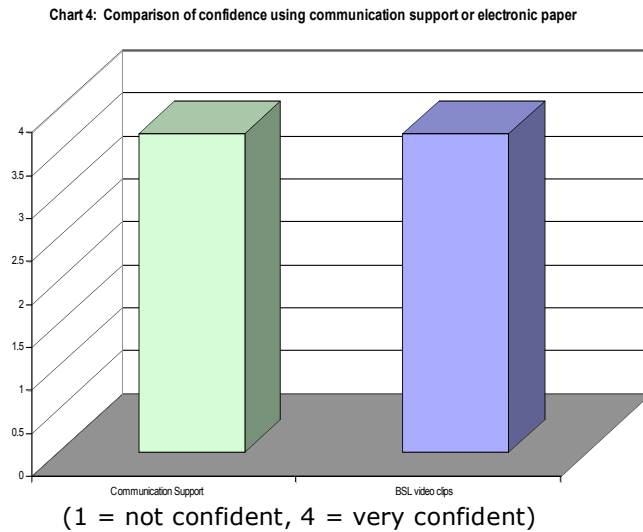
An ex-pupil (**G3**) said *"I feel better on my own as it is easier to concentrate."*

A teacher (**DST2**) noted that sometimes, students looked uncomfortable when having someone sitting near them during the exam waiting to be asked to sign the question.



(1 = no independence, 4 = total independence)

4. Would the pupils be confident using the electronic paper?



Overall, pupils are confident with either method equally. All pupils have been using communication support before for previous exams so they are used to having their support. From the data collected, it was found that pupils who are less confident with the electronic paper are those who use SSE and rely on lipreading (**DW1**) and those who are not familiar with some of the new signs that Gary was using in the exam (**SR1**).

A teacher (**GT1**) said that one of her pupils (**G2**), who uses SSE, really liked the new exam and *"it was a problem when he couldn't understand some of the signing but the lip pattern helped him. A person who signs with lip movement will be a big help"*. (This pupil gave a rating of 4 for confidence with the BSL video clips). The other teacher at the same school (**GT2**) thought it was important to have lip pattern too.

Another group of pupils were found to be less confident in using communication support. Their reasons are as follows:

(G1) *"I feel embarrassed when I ask the interpreter to sign again. Sometimes, there is a word in the exam paper that I do not understand then I would ask the interpreter what it means. She would sign but I would still not understand. Sometimes she doesn't know the sign for that word. I feel better if I can click on the computer to watch the BSL translation again and again"*.

(G3) *"It was hard using the interpreter during the exam because she was not very experienced in signing – not like Gary. My confidence depends on the signing level of the person who is doing the translation. Sometimes, they say 'what? when I sign.' I find it easier to understand deaf people. I want someone who can understand sign without saying "what?""*.

A teacher (**CST2**) commented, *"I think the pupils will like this new style of exam paper. It will mean that exams are less stressful for the pupils as they will not need to rely on the Teacher of the Deaf to sign the questions. They will not need to constantly ask for questions to be signed"*.

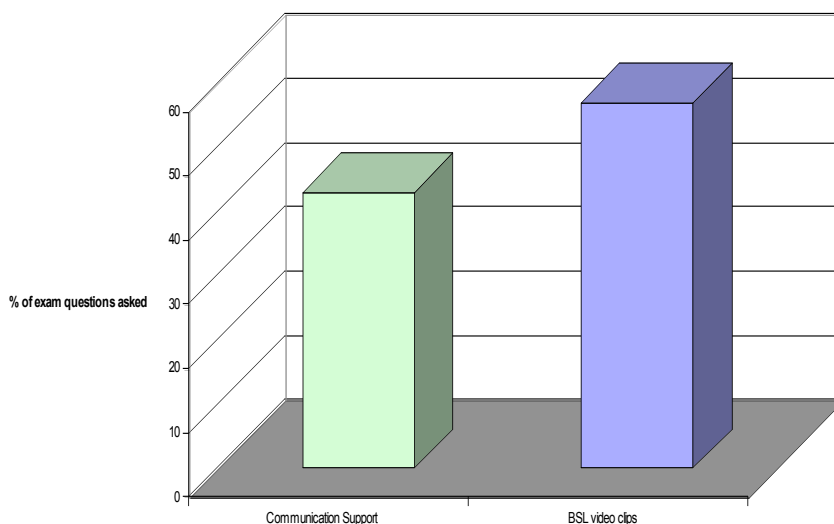
Another teacher (**DST2**) commented, *"Last year, we had one pupil who was expecting a certain person to translate the exam for him and that person became ill on the day of the exam. He was upset and he had to have a*

different person to sign for him. The signer was worried about her signing skill, and wasn't sure if it was good enough for him. If pupils practise with this new exam, he would be prepared and not get upset". (DSCW1 and DST1 confirmed this too).

A teacher (**DWT1**) was impressed by her pupils' concentration span (**DW1** and **DW2**). She said **DW2** would have given up long ago if it was only written.

5. How often do they ask for translation from the interpreter or use the BSL video?

Chart 5: Comparison of number questions asked for translation - communication support vs BSL video clips



Pupils ask the interpreter for translation of an average of 43% of the questions. One pupil asked only 2 questions of the whole paper.

Pupils used the BSL video clips for an average of 57% of the questions.

This shows that the pupils are making a choice in choosing when to ask for translation. They have the control. A few teachers think it is important for the pupils to have control in choosing when to ask for translation or click the video clip (**DWT1, GT1, GT2, DST2**).

A teacher (**DWT1**) said that pupils vary in how much they ask to be translated and some don't ask for any. Through her other work as an HMIE she has met pupils who said that it depends who is going to sign how much they will ask. Pupils have definite preferences about different signing styles.

6. Should SQA provide electronic exams with BSL translation for deaf pupils?

Including the responses from Calderside Academy pupils from their questionnaire, a total of 13 out of 14 pupils said "yes" (93%).

The one student (**DS4**) who did not think that SQA should provide electronic exams with BSL translation said "It was easy to follow the signer but I prefer to use my CSW because I don't follow BSL. I need my 'own sign language', and my CSW can create a 'special sign language' to suit me". It should be noted that this pupil is autistic.

His Chemistry teacher was surprised when she was asked what she thought of the new exam . . .” *I think it is really good. I have been watching **DS4**. Usually when you sign the questions, he would not watch you and he prefers to work on his own. With this e-paper, he was watching the video clips and answering the questions by himself. It is helpful for him”.*

Another student (**DW1**) said yes but she would like still to be able to have a choice of communication support –an interpreter or teacher.

Fourteen teachers and classroom assistants from 7 schools said ‘yes’ (100%). One classroom assistant (**DSCW1**) thinks the pupils should have a choice for their exams – electronic paper with BSL video clips or an interpreter. She felt that pupils feel more comfortable with people they know but she thought the paper will be fair for all deaf pupils in Scotland.

Overall

The results indicate that pupils and staff involved in this project would welcome the introduction of electronic examinations with BSL video clips and they would like still to be able to choose which method of support. The pupils are confident and feeling independent when using the electronic paper with BSL video clips. All found it easy to learn how to use the electronic paper. Training and practice should be offered to the pupils before doing the real exams – such as creating a bank of digital past question papers for schools and pupils to use for revision and practice. If successful, SQA could consider planning real examinations in this format for deaf candidates.

Comments by pupils and staff

Nearly everyone thought the new format is very good or excellent. They all thought the translation was very clear and of a high standard (**SRT1, GRT1 & AT1**). **GRT1** said *“Obviously a lot of thought has gone into deciding on the translation. They are clear and succinct. Quality of translations far superior to any translation produced on the spot having had one hour to look at the whole paper”.*

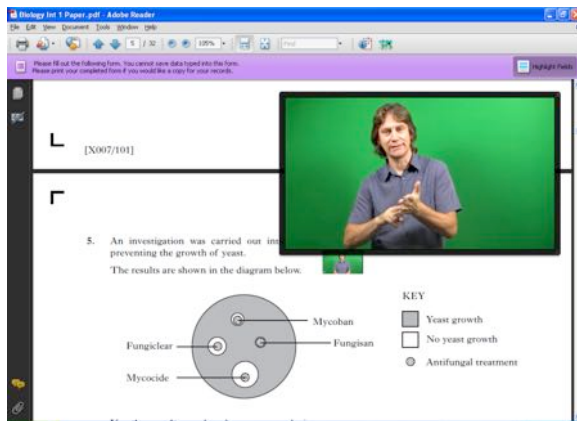
Two teachers (**DS1** and **DS2**) wanted a copy of the e-papers to help them with their communication in the classroom. Most want to have past papers in the same format for the pupils to help with their revision and practice for the real exams. They wanted to discuss technical and vocabulary issues too.

Technical

Background colour

One teacher (**DWT1**) and pupil (**DW2**) from Dingwall were not sure about the green colour in the Biology paper. The teacher found it a bit too dark. Another teacher (**AT1**) preferred the blue colour because she thought the contrast made the signing seem clearer. We used blue for Chemistry and green for Biology.

Size of video clip



Most pupils thought the size of the video clip was fine but one pupil (**CS1**) thought the video clip was too small and another (**SR1**) thought it was too large.

It is possible to change the size of the video clip by dragging on the bottom right corner. However, the video is not as sharp as the original size but you can still follow the signing. Different sizes of clips will be needed to be looked into.

Figure 6.3: Original size of video clip on screen

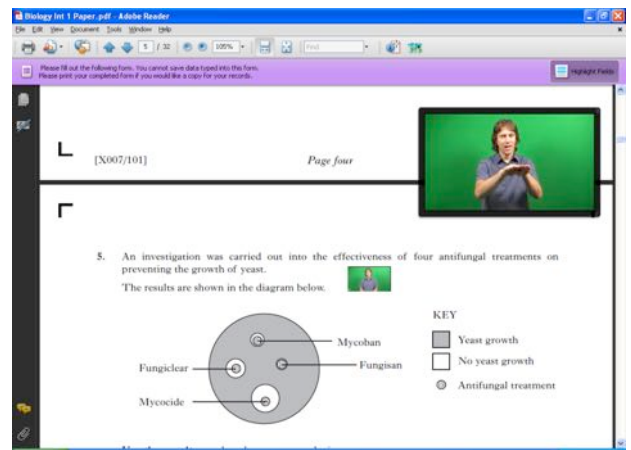
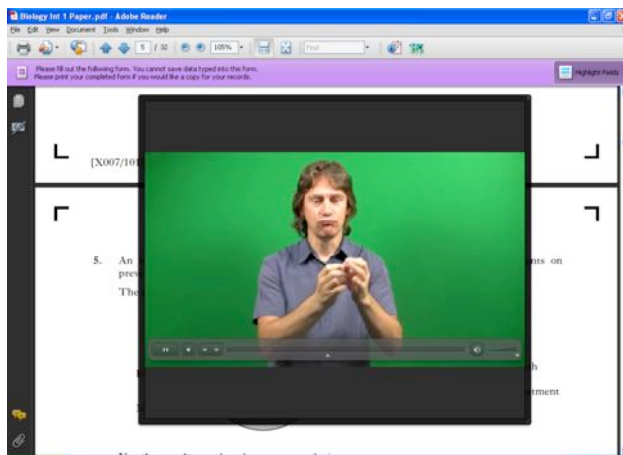


Figure 6.4: Size of video clip increased **Figure 6.5:** Size of video clip reduced

Video clip blocking the questions on the exam paper

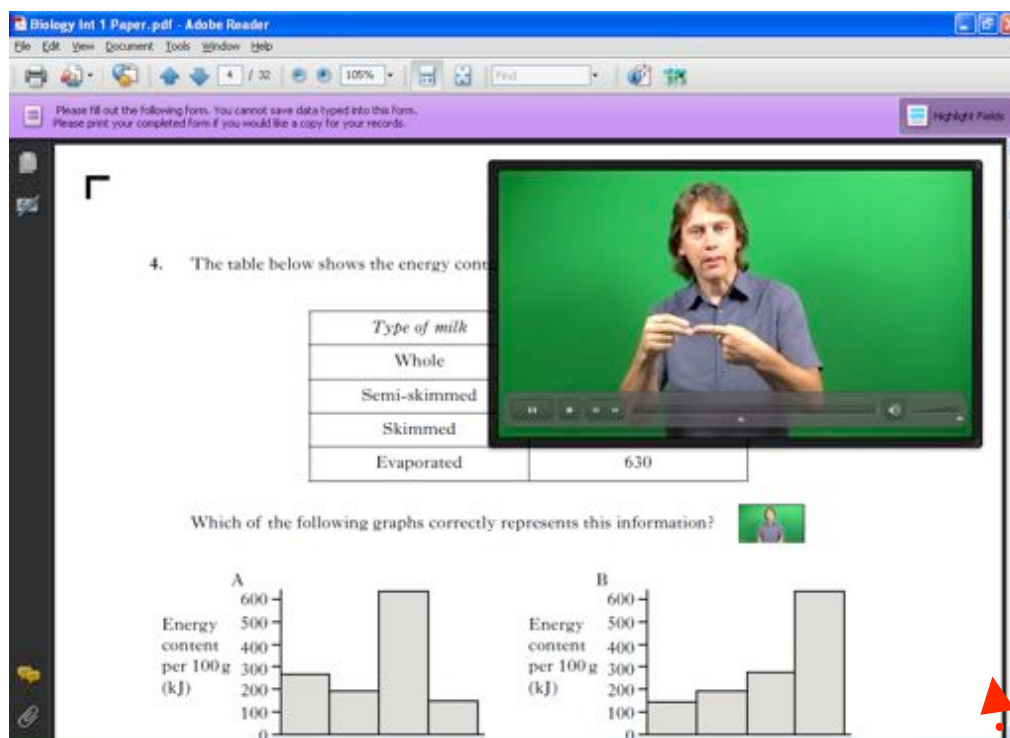


Figure 6.6: Question is being blocked by the video clip

There were some concerns from some pupils and teachers about the video clip blocking part of the questions. You can scroll down the page to see the text and the video clip will remain at the top right corner as seen in the picture below (Figure 6.7).

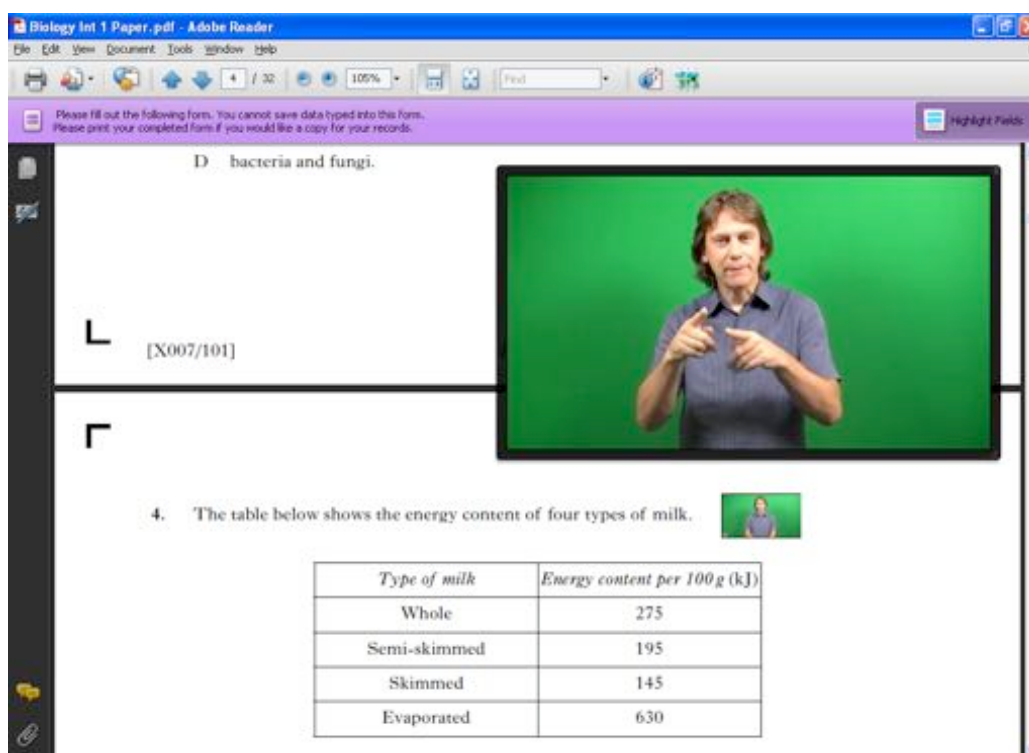
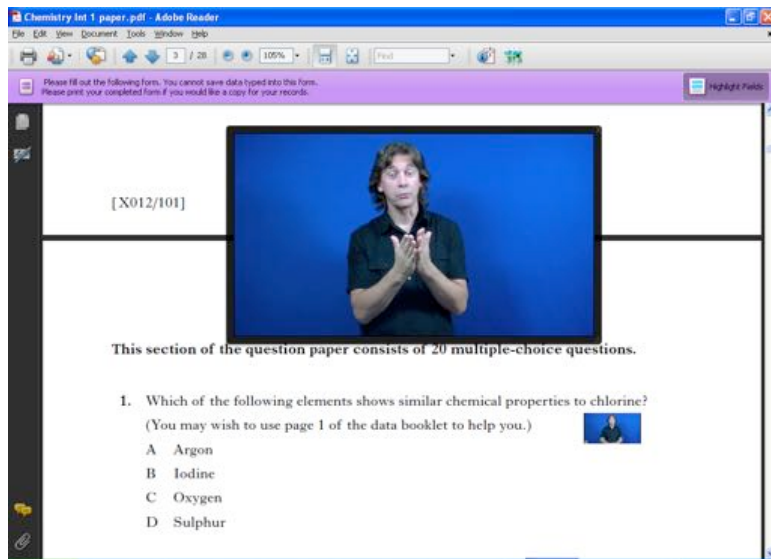


Figure 6.7: Question is being revealed by scrolling the paper down

One pupil (**SR1**) would like to see the video clip smaller so she can see more of the text on the screen. A teacher (**DST3**) suggested putting the video clip above each question.



However, if you put the video clip above each question you would need to change the layout of the exam paper to create space between questions. This wouldn't really be feasible if the pdf format of the exam paper is going to be used.

Figure 6.8: Putting video above each question

Access to computers

Teachers have expressed concern about access to enough modern computers for the examinations that are up to date with the latest version of Adobe Reader (9.0). In some schools, the computers are old and the teacher (**AT1**) was not able to open the video clips. **GRT1** said it takes longer to upload the videos in an old computer. **GT3** suggested a trolley of laptops would be ideal then teachers can choose a suitable room for the examinations. She also expressed concern about school buildings with limited space – finding a suitable room for several students sitting the same exam is difficult – e.g. Maths.

We need to consider how to support schools that don't have the technology.

Length of time

One teacher (**GT2**) was concerned about time. She said "*I think, this is fantastic but I think it is going to be a problem. Normally, our pupils will not ask a lot of questions to be signed. I don't know... I am not sure if they are shy or not. I think they like to try themselves. I think with this, they are not used to this way. It will take a long time to do the exam because I think for every question, they will use the BSL translation – it will slow the exam down. I personally think it is great. I think it is right to have lots of time but it will be difficult to decide how much time extra. They may need more time but they can't keep clicking forever.*" She thought it may take double time. We checked the timing of the exam for every student and all bar one managed to finish on time without having extra time (Table 6.5) but we cannot confirm what it will be like in real situations.

Vocabulary

Most pupils and staff asked about the standardised science signs because some pupils were not able to follow all the signs in the exam. Two teachers suggested making a DVD of all the signs for the pupils to take home to learn. We suggested a weblink to the SSC Science Glossary but they were concerned about pupils who don't have access to the internet at home. This would also prevent firewall blocking access to the website.

It is important to introduce the new signs to all the pupils and staff in Scotland to help them with the preparation for exams. If SQA is to introduce the new format for deaf candidates, we need to educate the pupils and staff with the new signs and how to incorporate them into everyday teaching.

Signed Responses

All schools asked about recording signed responses.

Statistics of requests of signed responses and actual figures in 2010

The following data were received from SQA at the Autumn Meeting of the Signed Transcription Review Group on 4th October 2010. Ten centres made a request from SQA on behalf of their 14 candidates to use the arrangement of signing their answers during the exams in 2010. A wide range of subjects was chosen - 22 different subjects at different levels (a total of 35 papers). Some papers are at 2 different levels, e.g. Standard Grade Credit/General or Standard Grade General/Foundation.

Centres	Number of Candidates
1. Wick High School	2
2. Elmwood College	1
3. Broxburn Academy	1
4. Donaldson's	1 ¹
5. Falkirk High School	2
6. Grange Academy	1
7. St Vincent's School for the Deaf	2
8. Calderside Academy	2
9. Motherwell College	1
10. Gourock High School	1

¹There was no mention of Chemistry Intermediate 1 being taken by 4 students at Donaldson's in 2010. It makes one wonder - what was the actual figure of deaf students in Scotland sitting the examinations in summer 2010? Was the actual number of candidates 8? I.e. a total of 36 papers?

Subjects

1. Administration Intermediate 1
2. Art & Design Intermediate 2
3. Biology Intermediate 1
4. Biology Standard Grade G/C
5. Care Intermediate 2
6. Chemistry Standard Grade G/C
7. Craft and Design Standard Grade G/C
8. Geography Intermediate 2
9. Geography Standard Grade F/G
10. Graphic Communication Standard Grade F/G
11. Graphic Communication Standard Grade G/C
12. Graphic Communication Higher
13. History Intermediate 1
14. History Standard Grade G/C
15. Home Economics Standard Grade G/C
16. Mathematics Standard Grade F
17. Mathematics Standard Grade F/G
18. Mathematics Standard Grade G/C
19. Mathematics: Maths 1, 2 & 3 Intermediate 1
20. Physical Education Standard Grade F/G
21. Physics Intermediate 1
22. Science Standard Grade F/G.

However, only 7 candidates from 6 centres actually used the arrangement (signing their answers) in 2010. Nine different subjects at different levels were taken (Int 1, Int 2, Standard Grade and Higher) in 2010 – a total of 12 different papers. Every year, the number of requests is always more than the actual number of pupils who want to sign their exams.

Centres

Number of Candidates

Wick High School	2
Elmwood College	1
Donaldson's	unknown
St Vincent's School for the Deaf	2
Motherwell College	1
Gourock High School	1

Table 6.6: Actual requests for signing responses by subject and level

Subject	Level	No of papers	No of candidates
Administration	Intermediate 1	1	1
Biology	Intermediate 1	1	2
Care	Intermediate 2	1	1
Craft and Design	Standard Grade G/C	2	1
Geography	Intermediate 2	1	1
Graphic Communication	Higher	1	1
Graphic Communication	Standard Grade G/C	2	1
History	Intermediate 1	1	1
Science	Standard Grade F/G	2	1
Total		12	10

The following subjects were requested earlier in the year but no signed responses were given:

Art & Design
 Biology Standard Grade G/C
 Chemistry Standard Grade G/C
 Geography Standard Grade F/G
 Graphic Communication Standard Grade F/G
 History Standard Grade G/C
 Mathematics Standard Grade F
 Mathematics Standard Grade F/G
 Mathematics Standard Grade G/C
 Mathematics: Maths 1, 2 & 3 Intermediate 1
 Physical Education Standard Grade F/G
 Physics Intermediate 1.

There could be many reasons why so many requests for signing in exams are being made and not taken up. One could be that pupils are not confident with the signed translation available to them. They could feel under pressure in that condition and prefer the anonymity of tackling the paper by themselves. These attitudes fit with the results from our interviews and Eileen Burns' interviews. However, we would need to ask pupils this more carefully in future research about why they changed their mind.

If it is possible to find a way to record pupils' responses more easily, we might see an improvement in the number of signing pupils who want to take the exam using sign.

Teachers and pupils wanted to be able to sign their answers via a webcam. So we showed the VOXUR (yellow box) for an idea of recording their answers.

VOXUR (yellow box)

According to 55degrees Limited, VOXUR is a 'film crew in a box' – containing everything needed to ask questions, record answers and play back the opinions expressed. It has a Mac laptop with an inbuilt webcam inside a sturdy yellow box.



Figure 6.9: Photographs of the yellow box

This portable easy to use videobooth enables a user to:

- Set questions and let VOXUR get the answers
- Record their response without peer pressure or interference
- Review and re-record answers
- Use VOXUR for playback in presentations
- Export as Podcast or Windows Media Files

It is popular for interviews for research, project assessment or gathering feedback. It is very simple and easy to use – there are green and red keys for pressing to work the 'yellow box'.

We think that the software may be ideal for recording pupils' signed responses. This software allows the user to review their responses before saving. If the user is not happy with the answer, they can re-record.

Gayle Henderson of Stevenson College kindly gave us the 'yellow box' on loan to trial with the deaf pupils and their teachers to see if they liked the software.

During the trial, on completion of the examination paper students were asked to complete further feedback using the 'yellow box' to test the suitability of this system for use in recording candidate responses in future.

At the 4 schools we visited, all pupils and teachers were enthusiastic about being able to record their own responses and play them back almost immediately for them to review. This would be ideal for pupils during exams when they want to double-check their answers. If they are not happy with the

answer, they can re-record it. They were amazed how simple it is to use the 'yellow box' and they prefer to be able to record independently via a webcam rather than with a camcorder.

We recommend that SQA investigate with 55degrees Limited the development of bespoke software using the yellow box (VOXUR) as a model with the pdf paper. This software would need to be distributed to centres and allow candidates to record and review their responses with a webcam.

The headteacher of Grange Academy is willing to buy webcams in preparation of the new type of exams. The head of service for deaf children had to tell him to wait until they receive instructions from SQA.

Here are the responses from students and teachers filmed by the Yellow Box:

"Thank you for participating in this trial. Do you like this new version of exam papers? We would like to collect your views"

- | | | |
|---|-----------------------------------|---------------------|
| GA1 | Grange Academy | 16 years old |
| I think it is easy to use and can understand the BSL translation of the questions. I can click the translation again and again. With an interpreter, we may be embarrassed to ask them to repeat the question. I don't like to ask the interpreter. I rather to use this and can click to watch the translation again and again. | | |
| DW1 | Dingwall Academy | 14 years old |
| No comment. | | |
| DW2 | Dingwall Academy | 14 years old |
| I prefer the old way where I rely on the person who signs . . . I don't know. | | |
| DWT1 | Dingwall Academy (ToD) | 21 plus |
| I like the new exam papers. Mmm, I am not sure about the background colour but it was good to see the signing with the text on the screen. The other thing, I liked .. is the independence and control when I want to click and when I want to read the question.. so that was good. Mmm, the other thing, I can't think.. I'm finished for the moment. | | |
| SR1 | St Roch's Secondary School | 15 years old |
| This exam with videos of Gary signing the questions. Some are clear but sometimes I couldn't understand the signs. | | |
| DST1 | Donaldson's (teacher) | 42 years old |
| I thought the electronic paper was brilliant. The questions were clear with better signing. Easy to understand. | | |

7. Recommendations for future developments

- 7.1 We recognise that teachers and pupils need several years to start using the new vocabulary in Biology and Chemistry before they will be able to take a digital signed exam paper. We suggest that Biology and Chemistry papers for 2011 are translated to BSL at the levels for which there have been requests from centres. There may be additional vocabulary to add to the glossary site. Then from 2012 Biology and Chemistry could go live as the first centrally translated exam papers.
- 7.2 We know from Eileen Burns' research and the feedback from our visits to schools and the SSC course in February 2010 that there is demand for other exam subjects to be translated. The building up of technical vocabulary is a crucial first step and should not be SQA's responsibility. We suggest that SQA facilitate a meeting with LTS and the Additional Support for Learning department of the Government's education department to explore funding possibilities for Mathematics, Craft and Design, Art, Art & Design and Physical Education vocabulary development. We have suggested these subjects because we have a basis for vocabulary in all these areas, as well as contacts with Deaf professionals who could help us collect and develop new technical terms. We also know that many deaf pupils take these exams.
- 7.3 We suggest that SQA provide clearer advice to centres about the minimum skills needed for providing signed exam papers locally. For example that the members of staff should have subject knowledge and level 3 BSL certification or above, and that the centre should seek support from a qualified and registered BSL/English interpreter or deaf tutor with translation skills.
- 7.4 We recommend that paper translation teams should have a mix of skills including knowledge and experience with translation, complete fluency in both BSL and English, advanced technical knowledge in the subject area, experience at teaching in schools and video editing skills. A quality check system should be built into the production of exam papers.
- 7.5 We recommend that definitions for as many as possible of the 450 new signs collected and developed for this project are provided in BSL and translated for the SSC Glossary website. This recommendation is already the subject of a second project with SQA/SSC.
- 7.6 We recommend that the SSC set up a Twitter page linked to the BSL Glossary site so that teachers, pupils and CSWs can receive notice as soon as new subject terms are added to the site. The SSC is already investigating this.
- 7.7 We recommend that SQA investigate with 55degrees Limited the development of bespoke software using the yellow box (VOXUR) as a

model. This software would need to be distributed to centres and allow candidates to record and review their responses with a webcam. It must be recognised that a few centres translate their pupils' responses live and may want to continue with this method.

- 7.8 Despite the availability of more centrally produced exam papers, we suggest that centres should be able to continue to choose which method candidates prefer. We found some pupils wanted a live English speaker (with minimal signs) or the reassurance of a known person translating the exam.
- 7.9 We suggest that the best way to distribute signed exam papers is by memory stick, to be kept by the examination officer securely with other papers.
- 7.10 If centres use laptops, they should ensure that the screen is a minimum of 17 inches and that it is possible to print out from the laptop.
- 7.11 We recommend that SQA locate the translated papers on the past papers website so that teachers and pupils can use them for exam preparation.

8. Conclusion

The project team has enjoyed working on this project. We are pleased with the technical achievements we have made in finding a way to insert signed BSL translations into a digital paper. We have had great support from our existing network of Chemistry and Biology Deaf professionals in collecting and creating 450 new terms to support the translations. We worked out ways to translate, check and edit more efficiently in future. The feedback from centres was a most valuable part of the project. Together with earlier research from Eileen Burns it suggests that pupils are often under pressure in the signed exam situation, and so are the staff. Having some centrally produced exams in BSL would be a good way to improve candidate autonomy and make arrangements for translated exams easier for centres.

Thanks to:

Pupils and teachers for participating the trial: Grange Academy, Dingwall Academy, St Roch's Secondary School, Donaldson's, Calderside Academy, Gourock High School and Auchmuty High School.



SSC team: Janis Sugden, Elizabeth Izatt, Sheila Mackenzie and Ruth Simpson

CALL team: Paul Nisbet and Barrie Barreto

Research findings on fair access to signing exams in Scotland: Eileen Burns

Loan of Yellow Box (VOXUR): Gayle Henderson of Stevenson College, Edinburgh

BSL vocabulary team: John Denerley, Claire Leiper, Janet Wardle-Peck, Tania Allan, Rob Rattray, Gerry Hughes, Derek Rodger, and Dr Mark Fox.



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Appendices

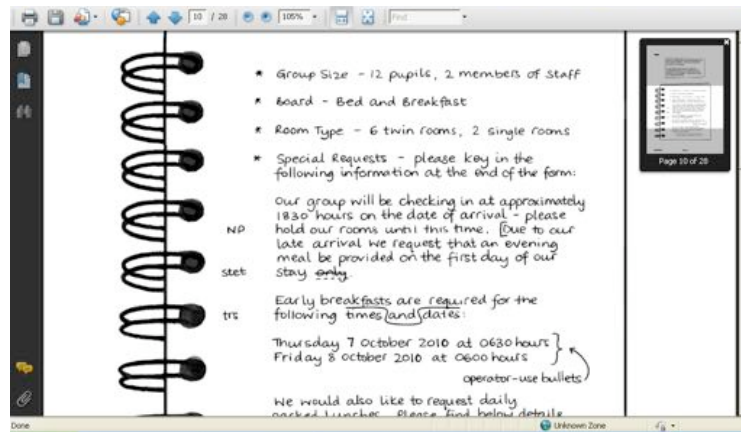
- A. Logistics of translating different papers
- B. Equipment purchased for the project
- C. Evaluation form for pupils and teachers with DVD
- D. Consent forms
- E. Evaluation Questionnaire.

Appendix A: Logistics of translating different papers

A sample of different exams was checked to see how many questions are in per paper and to see roughly how long it would take to translate. Students sat these exams in summer 2010.

Administration

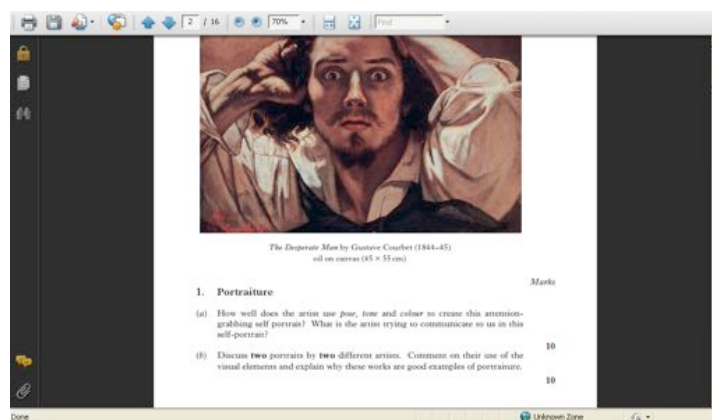
http://www.sqa.org.uk/pastpapers/papers/papers/2010/Int1_Administration_all_2010.pdf



There are 4 tasks of different activities for the students to complete – 28 pages. There are a lot of long questions with instructions.

Art and Design – Intermediate 2

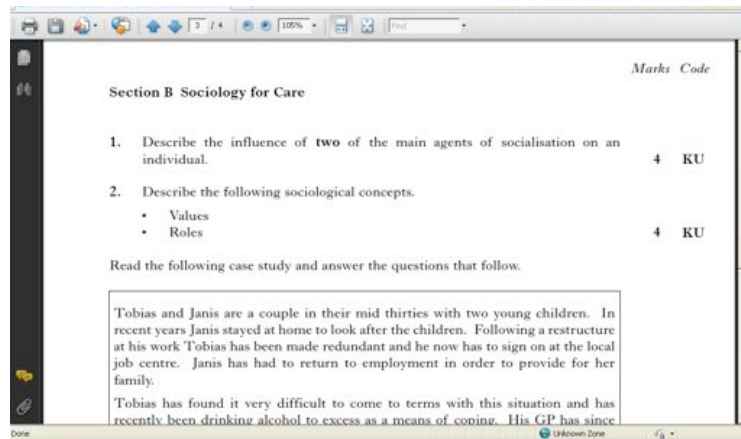
http://www.sqa.org.uk/pastpapers/papers/papers/2010/Int2_Art-and-Design_all_2010.pdf



In this paper, there are 12 questions of similar format as shown above – 16 pages.

Care – Intermediate 2

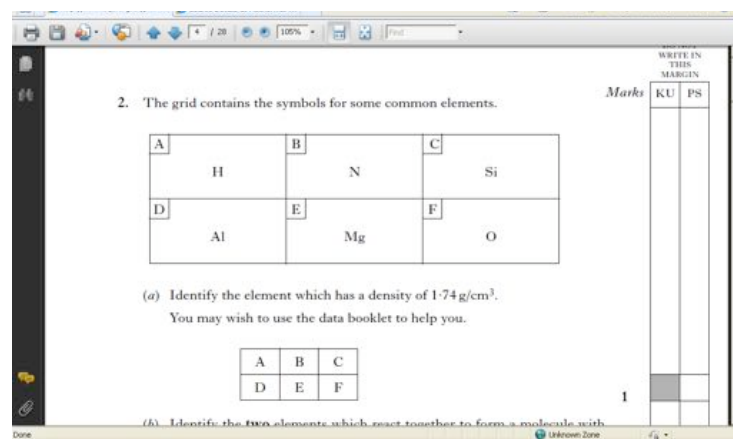
http://www.sqa.org.uk/pastpapers/papers/papers/2010/Int2_Care_all_2010.pdf



4 pages of questions.

Chemistry – Standard Grade Credit

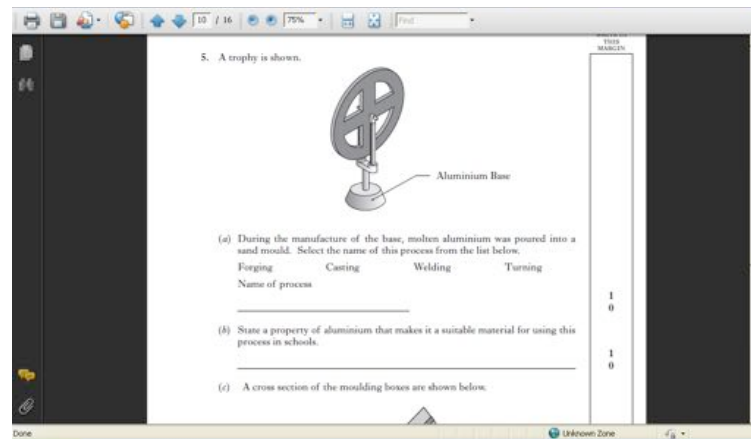
http://www.sqa.org.uk/pastpapers/papers/papers/2010/SC_Chemistry_all_2010.pdf



Similar number of questions as Standard Grade Credit Biology – 28 pages.

Craft and Design – Standard Grade General

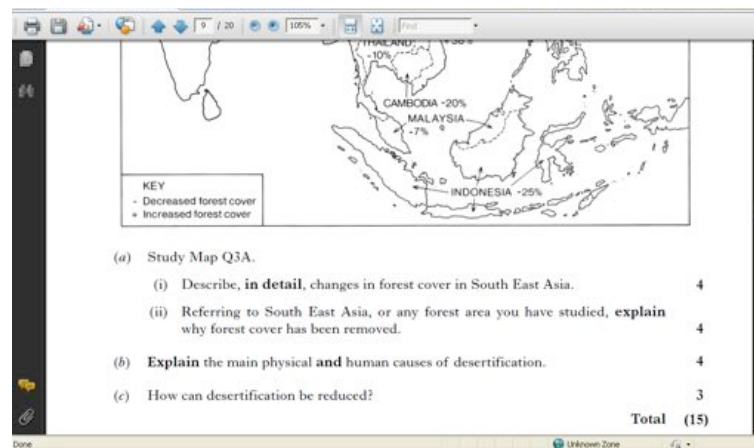
http://www.sqa.org.uk/pastpapers/papers/papers/2010/SG_Craft-and-Design_all_2010.pdf



Seven questions with sub-questions – 16 pages.

Geography Intermediate 2

http://www.sqa.org.uk/pastpapers/papers/papers/2010/Int2_Geography_all_2010.pdf

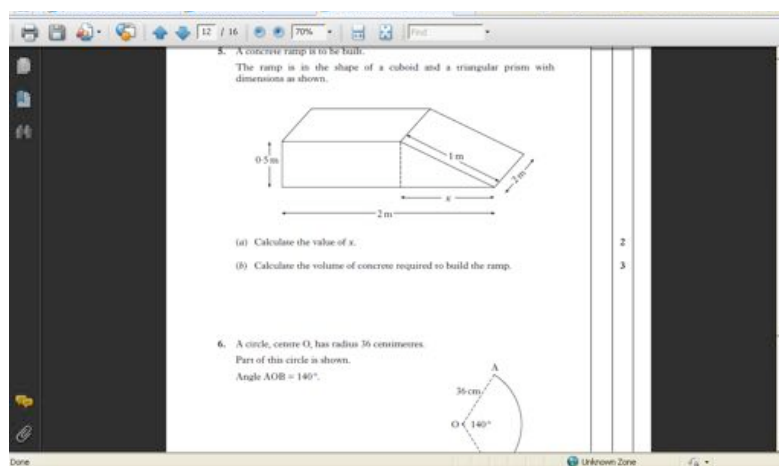


20 pages of questions with sub questions.

The length of time to translate the paper depends on the level of exam. The harder the exam, the longer it will take to translate where the questions are more difficult to translate. It will also depend on the number of sub-questions per question. Some papers have more long questions than others. For the Biology and Chemistry papers, it took one day to translate one paper. This will give us a rough idea how long others will take.

Maths Standard Grade Credit

[http://www.sqa.org.uk/pastpapers/papers/papers/2010/SC_Mathematics_Paper-1-\(Non-calculator\)-and-Paper-2_2010.pdf](http://www.sqa.org.uk/pastpapers/papers/papers/2010/SC_Mathematics_Paper-1-(Non-calculator)-and-Paper-2_2010.pdf)



~ 12 questions per paper (with sub-questions) – a total of 24 questions for 2 papers.

Physical Education – Standard Grade Foundation

QUESTION 1

This piece of action takes place in a swimming pool.

Part A The girl is practising a back crawl turn.

Which of the following statements are **true** and which are **false**?
Tick **one** box each time.

<i>Statement</i>	<i>True</i>	<i>False</i>
Swims in a straight line		
Stays on her back throughout		
Hands touch wall during turn		
Pushes off wall with feet		

Activity: Swimming

Marks: EV

DO NOT WRITE IN THIS MARGIN

There are 10 questions with sub-questions of similar format. The questions are linked to a DVD showing different actions. Is there voice-over on the DVD? Will this DVD need to be translated too?

Appendix B: Equipment purchased for the project

Equipment	£
JVC GZ-HD40 Full HD EVERIO HDD Camcorder with 120GB Internal Hard Disk Drive	407.98
DURAGADGET Video Camcorder/Digital Camera carry case	14.49
Integral USB 2.0 Single Slot SD Reader	1.54
SanDisk 16GB SDHC Secure Digital Card	16.99
Panasonic Mini HDMI Cable 1.5m	13.85
Interfit INT290 Background/Reflector Stand	42.83
Autocue Mirror	205.66
TOTAL	703.34

We borrowed the chroma-key screen, lights and tripod for the camcorder from SSC.

Appendix D: Consent forms

Evaluating the digitalised SQA examination papers - translated in British Sign Language.

What is the project?

The Scottish Sensory Centre (SSC) is doing a trial on making digital exams in British Sign Language (BSL). Deaf students will be able to see video clips of a person signing the exam questions in BSL.

At the moment, a member of staff from school signs the questions to the deaf pupil. Most schools have a problem with finding enough staff to sign the questions for the pupils. There is also a problem in the way the questions are being asked with different levels of signing skills in different schools.

Making a centrally produced examination paper with video clips in BSL may help with these problems. There are more vocabulary signs on the SSC glossary website and we hope these will help the schools and their staff to prepare students for exams.

Who is conducting the study?

This pilot is funded by the Scottish Qualifications Authority (SQA). Dr Audrey Cameron, Gary Quinn and Rachel O'Neill at the Scottish Sensory Centre (Edinburgh University) are carrying out the research. If you would like any further information, please contact Rachel on 0131 651 6429, or text her on 07961661788.

Or you could write to the following address:

Rachel O'Neill
Scottish Sensory Centre
Moray House School of Education
The University of Edinburgh
Holyrood Road
Edinburgh EH8 8AQ

E-mail: rachel.oneill@ed.ac.uk

What will this mean for you?

We would like your son/daughter to try a new style of SQA examinations. The exams are in an electronic format with video clips showing British Sign Language (BSL) translations of each question. We would like your son/daughter to compare this format with the interpreters or teachers used in the previous exams.

During November, Dr Audrey Cameron and Gary Quinn from the Scottish Sensory Centre will visit your son/daughter's school and set up this new type of examinations. With your permission, we would like your son/daughter to try this summer's exams in using the new version. Afterwards we will ask your son/daughter for his or her feedback. The time needed will be the length of the exam, a break and then 15 minutes with each pupil or with a group of pupils to ask them for their views on the arrangements.

We will conduct the interview in British Sign Language. Both researchers are deaf themselves and are fluent BSL users. If your son/daughter prefers to use spoken English, Dr Audrey Cameron would interview him/her.

We hope that your son/daughter will be able to take part. The views of deaf users are really important to us and will help us to develop a suitable format for deaf students.

With agreement from you and your son/daughter, the interview will be video-recorded. We are offering two methods of recording the interview:

- A. The video will show both the researcher and your son/daughter
- B. The video will only show the researcher, who will shadow what your son/daughter signs

The researcher will ensure that children do not feel they have to take part and that they are comfortable with the process. The video recording will not be used in presentations about the research.

Consent

The pilot has received the support of the Head Teacher and Edinburgh University Faculty of Education Ethics Committee. Any parent(s) or legal guardian(s) who wishes to withdraw their son/daughter from the trial can do so by completing the Parental Consent Form. We also ask that you discuss this with your son/daughter and check that they are willing to take part. Please return this form using the stamped addressed envelope enclosed.

Confidentiality

All information collected through the project will be treated confidentially. Only the research team will see pupil names. No names of individuals will be released to any other organisation, nor will they be identified in any reports or publications arising from the study. The video recordings will only be used for this study and will be kept securely at Moray House, then destroyed after 3 years.

Use of results

We intend that the main findings from this research will be used to help us to improve the digitalised examination papers and the findings will also be reported to SQA. We will also inform parents and young people the outcomes by putting a summary on the SSC Glossary website.

Weblinks to Scottish Sensory Centre's Glossary website

<http://www.ssc.education.ed.ac.uk/bsl/list.html>

Draft websites with new signs developed or collected in 2010:

<http://www.ssc.education.ed.ac.uk/bsl/biologyrough.html>

<http://www.ssc.education.ed.ac.uk/bsl/chemistryrough.html>

*Evaluating the digitalised SQA examination papers - translated
in British Sign Language.*



Please Tick

I have read and understood the information provided and
would be happy for my child to take part in the trial at school.

Interview method:

A. I am happy for you to video my child for the interview.

B. I would like you to use the shadowing method and
not video my child directly.

I would like to discuss this further with you before
deciding about taking part

OR

I would prefer my son / daughter not to take part in the trial.

Parent / Guardian's Name

Signature Date

Contact telephone number

Preferred time (if any) for contacting you

Child's name

**PLEASE RETURN THIS FORM AS SOON AS POSSIBLE
IN THE ENVELOPE SUPPLIED. THANK YOU!**

*Evaluating the digitalised SQA examination papers - translated
in British Sign Language.*



Please Tick

I have understood the information signed to me
about this interview and I agree to take part.

OR

I do not want to take part in the interview

Name

Signature

Date

Appendix E: Evaluation Questionnaire

School:.....

Staff contact:.....

Student's Name (optional):.....

Email address.....

Tick and score each exam in which you have used communication support and the electronic exam with BSL video clips that you tested.

Exam	Did you sit this exam? If not, why?	When you sat the exam what assistance did you use(e.g. extra time, sign language interpreter, CSW, lipspeaker, teacher of the deaf, etc)	Communication support			Electronic exam with BSL video clips	Did you understand the person signing the questions? Very hard = 1 Very easy = 10	How many questions did you use the BSL video clips?
			Did you use communication support? (tick Yes or No)	Ease of using communication support. Very hard = 1 Very easy = 10	How many questions on the paper did you get translated?	Did you watch the video clips of BSL translation of exam questions? (tick Yes or No)		
Standard Grade Biology			Yes..... <input type="checkbox"/> No..... <input type="checkbox"/>			Yes..... <input type="checkbox"/> No..... <input type="checkbox"/>		
Intermediate 1 Biology			Yes..... <input type="checkbox"/> No..... <input type="checkbox"/>			Yes..... <input type="checkbox"/> No..... <input type="checkbox"/>		
Intermediate 1 Chemistry			Yes..... <input type="checkbox"/> No..... <input type="checkbox"/>			Yes..... <input type="checkbox"/> No..... <input type="checkbox"/>		

A few more questions.....

Question	Communication support	Electronic paper with BSL video clips
How familiar were you with this method before the exam? (1 = not familiar 4 = very familiar)	1 2 3 4	1 2 3 4
How easy was it to learn to use this method? (1 = very hard 4 = very easy)	1 2 3 4	1 2 3 4
How much would you rely on this method of assistance? (1 = definitely not rely on 4 = definitely rely on)	1 2 3 4	1 2 3 4
How much independence does each method give? (1 = no independence 4 = totally independence)	1 2 3 4	1 2 3 4
How confident would you be in an exam in each method? (1 = not confident 4 = very confident)	1 2 3 4	1 2 3 4
Finally please give an overall rating to compare each? (1 = poor 4 = excellent)	1 2 3 4	1 2 3 4

Should SQA provide exams for students requiring special arrangements in this kind of electronic format with BSL video clips?

Yes.....

No.....

Please suggest any improvements to the electronic exams with the BSL video clips:

Have you seen the new science signs on the Scottish Sensory Centre website?

Any other comments:

THANK YOU VERY MUCH FOR COMPLETING THIS QUESTIONNAIRE

Blank Page

Contact Details

SSC

Janis Sugden, Co-ordinator	0131 651 6071
Rachel O'Neill, Lecturer in Deaf Education	0131 651 6501
Carole Torrance, Deaf Education CPD Organiser	0131 651 6501
Alison Duthie, Braille Tutor	0131 651 6501
Elizabeth Izatt, Website Development Manager	0131 651 6070
Sheila Mackenzie, Resource Library Manager	0131 651 6069
Ruth Simpson, Administrator/Supervisor	0131 651 6501
Linda Hope, Senior Secretary	0131 651 6501

VI Scotland

Dr David Feeney, Manager	0131 651 6078
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<http://www.ssc.education.ed.ac.uk>

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