

# **Application of Number in Vocational Education**

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## **Introduction**

General National Vocational Qualifications (GNVQ) are vocational awards available at any of three levels and can be taken over one or two years for depending on the level. This is a standard college-based qualification that has been developed in England and Wales over the last five years. The three levels are: Foundation, Intermediate and Advanced. They require as mandatory units three key skills, including Application of Number. To achieve the full diploma students must pass all mandatory units.

## **Structure of GNVQ**

The three levels of a full GNVQ can be compared to the standard English and Welsh school examinations. The Foundation is considered equivalent to four lower grade GCSEs; the Intermediate is considered equivalent to four Grade C GCSEs; the Advanced is considered equivalent to two A level passes. Application of Number units are offered at levels 1, 2 and 3 respectively. However, Application of Number units are not equivalent to GCSE and A level mathematics in the same way. Very approximately, Level 1 is pre GCSE mathematics, Level 2 is middle and lower GCSE mathematics grades and Level 3 the higher GCSE mathematics grades.

The structure of GNVQs, including Application of Number, were originally devised by the National Council for Vocational Qualifications (NCVQ) which is now part of the Qualifications and Curriculum Authority (QCA).

The GNVQs are awarded by a number of examining bodies, who traditionally have administered vocational qualifications; they are EDEXCEL (previously BTEC), AQA (previously City & Guilds) and OCR (previously RSA). These bodies award the certificate and moderate the assessments made in colleges. However, teaching materials and assignments for assessments are produced or purchased at college level.

Students choose to take one vocational area out of: Art & Design, Business Studies, Engineering, Health & Social Care, Information Technology, Land & Environment, Leisure & Tourism Media and Science. Most students on these courses are aged 16 to 19 years old, though there are also some older students.

## **Application of number in practice**

As many students have opted for the vocational aspect of a programme the delivery and assessment of Application of Number presents difficulties for teachers if key skills are not integrated into the assessment plan of the vocational units. Some colleges employ specialist Maths/Numeracy lecturers to deliver and assess Application of Number or provide underpinning knowledge. However there are some colleges who prefer to employ vocational staff with limited specialist underpinning knowledge in key skills but experienced in vocational work.

There are increasing numbers of adults returning to learning. Some colleges have developed innovative methods of delivering the programme in reduced time periods (fast track). Application of Number is still an integral element. This has caused problems for some students particularly adults who have had poor experience of number at school. The approach to Application of Number in this situation as with 16-19 year olds, requires a more sensitive approach and more integration of key skills as part of vocational assignments.

There has been some serious concern expressed nationally about the lowering of standards in key skills particularly Application of Number and Communications (another GNVQ key skill). The current pilot of a new vocational GNVQ is running parallel to a pilot of new key skills specifications which requires students to produce evidence in report form from within vocational settings.

Some colleges have developed workshops with resources available on a drop in basis to provide students with the essential underpinning knowledge. In other vocational programmes key skills are required at levels prescribed by the lead industrial awarding bodies. In GNVQ programmes key skills must be achieved at the level of the vocational programme.

## **Problems in using application of number**

I am working with a wide variety of students in an inner city College supporting and assessing Application of Number. At ALM5 I presented a summary of the problems that I have encountered.

### **1 Vocational Relevance**

The ideal is that numeracy and mathematics problems presented in the vocational context will be more interesting and attractive to the students.

The problem is that the students are only just beginning to learn about their chosen vocational area. This means the value of vocational relevance as a motivational tool is less than might have been hoped.

### **2 Basic Skills**

The rigidity of the assessment process makes it difficult to develop a natural link between successfully completing the Application of Number unit and the acquisition of useful basic skills and techniques.

In addition the pressure on course hours (across the college) means that the amount of time to deliver additional support for basic skills in numeracy workshops or additional classes is very limited.

### **3 Course Structure**

If the course structure does not include full integration of Application of Number within the vocational course units the number work fails to be seen as essential to achieving the GNVQ. Therefore the students give this work very low priority. However, to integrate properly requires a lot of preparation time, including time for numeracy and vocational specialists to work together. At present such time is not being made available.

### **4 Assignments**

The pressure to complete assignments by the end of the course and to collect enough evidence for the final portfolio of work leads to the students getting each individual piece of work 'done', with whatever help they can find. The assignments fail to encourage learning and development of basic and transferable skills.

### **5 Performance Criteria**

The assessment procedure uses performance criteria as measures of competence and specifies specific types of work that are required as evidence indicators. This creates a barrier between assessment and further learning opportunities.

## **Responses from ALM5 participants**

The ALM5 participants were presented with the full details of the GNVQ assessment schedule and the problems I had encountered. A questionnaire was available for participants to use. The response to the poster display was very mixed, but could be divided into two main categories. There were those who had some knowledge of GNVQs, who shared their experience with me, and generally were in agreement about the problems described above. The other group were those completely unfamiliar with GNVQ or Application of Number who were interested to know more about it factually and compare it to schemes with which they were familiar.

The questionnaire was, in fact, completed by very few participants and so it has not been possible to summarise the views expressed. However, a copy of the questionnaire is attached to this paper.

## **Summary**

This paper describes the assessment process of Application of Number which is a key skill unit in the GNVQ. Its place in the assessment of vocational education is described. Particular problems with the practice of using this assessment procedure are put forward. The basis of this paper was a poster presentation which presented conference participants with detailed information about Application Of Number. A questionnaire was available for participants to record their views on the information presented.

**References**

Benn, R. (1997) *Adults count too, mathematics for empowerment*. Leicester: NIACE, UK

Qualifications and Curriculum Authority. (1997) *Key Skills units, pilot programme* [Ref QCA/97/038]. London: QCA, UK

**Appendix**

**Conference Attendees Questionnaire GNVQ Application of Number**

This poster presentation introduces you to the content and delivery of the key skill "Application of Number" for General National Vocational Qualifications (GNVQ)

Although mainly factual a number of issues are raised and I would be interested in the reactions to this from other conference attendees.

Please complete the following questionnaire as well as you can.

01	Are you familiar with GNVQs?	yes no	<input type="checkbox"/> <input type="checkbox"/>
02	Are you familiar with application of number?	yes no	<input type="checkbox"/> <input type="checkbox"/>
03	Are you familiar with a qualification similar to GNVQs?	yes no	<input type="checkbox"/> <input type="checkbox"/>
04	Are you familiar with anything similar to Application of Number?	yes no	<input type="checkbox"/> <input type="checkbox"/>
05	Are you aware of current research into this method of assessment?	yes no	<input type="checkbox"/> <input type="checkbox"/>
06	Do you think this structure forms a teaching programme?	yes no	<input type="checkbox"/> <input type="checkbox"/>
07	Do you think vocational relevance helps motivate students?	yes no	<input type="checkbox"/> <input type="checkbox"/>
08	Is this creating a new mathematics?	yes no	<input type="checkbox"/> <input type="checkbox"/>
09	Do you think the content is too narrow?	yes no	<input type="checkbox"/> <input type="checkbox"/>
10	Is Application of Number a fair test of a student's numeracy?	yes no	<input type="checkbox"/> <input type="checkbox"/>
11	Do you think Application of Number includes appropriate number skills?	yes no	<input type="checkbox"/> <input type="checkbox"/>
12	Does this structure help students identify their numeracy needs?	yes no	<input type="checkbox"/> <input type="checkbox"/>
13	Does Application of Number identify the most relevant basic skills?	yes no	<input type="checkbox"/> <input type="checkbox"/>
14	Does this structure support a flexible approach to teaching numeracy?	yes no	<input type="checkbox"/> <input type="checkbox"/>

15	Do you teach numeracy and/or mathematics?	yes no	<input type="checkbox"/> <input type="checkbox"/>
16	Do you teach numeracy/mathematics to teachers?	yes no	<input type="checkbox"/> <input type="checkbox"/>
17	Are you currently undertaking educational research?	yes no	<input type="checkbox"/> <input type="checkbox"/>
18	Which age groups do you teach?	5-10 11-15 16-19 20-25 over 25	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

19	Where do you teach?	School FE/ Technical College Teacher Training Industry/Training Centre University	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
20	Are you currently undertaking mathematical research?	yes no	<input type="checkbox"/> <input type="checkbox"/>
21	In what country are you currently working?		
22	In which country did you receive most of your education?		
23	In which age group are you?	18-25 26-39 40-54 55-70 over 70	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
24	Are you	Female? Male?	<input type="checkbox"/> <input type="checkbox"/>
25	Please add any comments you think might be helpful		