Does the Sum of the Parts = the Whole

D Bickerstaff
LSIS 2013

Contents Page

Abstract

The project investigated student opinions of functional skills Math in reference to the use of practical applications and a collaborative teaching approach to assist the learning and engagement of kinaesthetic learners in Further Education. This was supported by a literature review based around The Wolf report and student centred learning techniques towards engagement.

Opinions of students were collected from a representative cohort and graded 1-5 (VG-P), student opinions where then subjected to statistical analysis. Results gained suggest that the majority of students are aware of the use of functional skills and their preference seemed to be towards practical sessions. Feedback suggests that practical math was more preferable to the traditional taught lessons. Surprisingly not all students seem to have an understanding of where math plays a role in their own vocational area with 16% disagreeing that math has a functional role within their main subject area. The use of a collaborative approach between Functional Skills Specialists and Vocational Tutors proved to be positive experience for both the teaching teams and the learners.

Key conclusions show that math taught practically is more likely to engage students and that students' would prefer to have more class sessions using practical based math. The collaborative approach has developed supportive links with college areas and allowed for math that is specific to areas to be recognised and mapped to the functional core topics this has allowed for the development of Schemes of works that use class work that has direct relevance between math, and students chosen vocation and life.

Introduction and context

A project was designed to examine whether a kinaesthetic collaborative approach to Functional Skills Math can improve the engagement of learners "it is a teachers passion for their subject that provides the basis for effective teaching" (Cook, 2003), however passionate a teacher is, if students have no passion, or if the passion is not translated into effective strategies will learning take place? Recent statistics suggest that 22% of 16-19 and 24% of adults lack functional numeracy skills (Guardian 2011,BIS 2011) this is approximately a quarter of the population. Perhaps by engaging learners by using a collaborative approach then statistics like these could be lowered?

An investigation into the use of Student Centred activities and practical based learning will be carried out to ascertain if focus and engagement with mathematical based topics, improves with the introduction of practical elements of math

In current theoretical based math sessions it is challenging to teach learners with "no hope" in the subject. The intention of this research was to find out if practical maths sessions /methods work, and if there was improvement in student engagement and capacity to see the relevance of math to their other subjects.

The research was designed to encourage the student voice to be heard, and the analysis of student based approaches in class activities may help determine whether this leads to better engagement. This research has stemmed from the LSIS grant provided to design Student Centred Practical Learning in Functional skills.

Aim

To share math concepts with curriculum areas and develop students learning by being inspired to improve their math.

Objectives

- Use creative math approaches to develop learner ability, achievement and autonomy.
- Use of practical active math to creative a holistic environment in vocational teaching areas.
- To develop a collaborative relationship with vocational teaching areas to bridge the relevance of functional skills math.

What is Action Research?

A number of different definitions exist for action research, action research was coined by Kurt Lewin as “A comparative research on the condition and effects of various forms of social action and research leading to action” (Lewin, 1948, 202-203). This research has been designed to improve practice, improve the understanding of practice and improve the situation in which the practice takes part as described by Carr and Kemmis (1986), Carr and Kemmis classical British definition - forms part of the ethos of this project. It will allow for personal development and academic institutional development, making a change for students based on their responses. Bogdan and Bilkens’ (1992) definition of Action Research is also apparent in this project “the systematic collection of information that is designed to bring about social change”. Viewing the college as a society/ community allows for this definition to be expressed in the project. In a wider context, if math can be taught in more practical ways and that is the preferred view of the Student body then hopefully a wider social change could eventually take place. Based on the earlier figures of a lack of mathematical ability more success in math could be a step forward to the social and national development of math skills.

Literature review

Currently the education system offers qualifications in Functional skills "Functional Skills are transferable skills" (GOV 2009) offered to 14 -19 year olds. Adult Literacy and Numeracy (ALAN) are "Adult basic skills but can be taken by learners at any age" (Edexel 2009) but are commonly sat by 19+ year olds. Functional skills are defined as " Assessments that are sufficiently flexible to meet needs of a wide range of organisations, the assessment must provide realistic contexts, require application of knowledge, require problem solving and assess processing skills in different contexts" (www.education.gov.uk). They were developed "in response to the employability in the government 14-19 education and Skills White paper. They offer learners useful, transferable skills" (Blaszczky, 2011).

Functional skills maths includes reading, writing, listening, speaking, calculations, interpreting, presenting, finding and selecting information, entering and developing information and developing presentation skills (Wilson, 41-47, 2008). Despite the importance of these skills being viewed, reviewed and published, it is difficult to engage learners in Functional Math. This stems from misconceptions, preconceptions and a lack of interest. "Student centred learning is about helping students acquire effective study skills that will be valuable in life" (Hall, 2006). Wallace's' Razzmatazz, and Crowley's' props offer something different in lessons and Paul Wakeings' concept on "dancing on the edge" accompanied by Coffield realistic view at teaching for the student not the government all suggest Student Centred Learning as an effective way to achieve engagement, and that engagement can help success.

Wallace: - "In the process of teaching the prescribed lesson content you have the opportunity to establish that the learning in itself can be enjoyable, learners will then be motivated if they find it fun" (Wallace, 2007, p 61).

Therefore in this case vocational learners find practical classes and the application of work more enjoyable they will be more motivated by practical math.

Cowley:- “ A lesson that will engage your students usually offers them something different, something unusual, using props will help gain the vital reputation of being an interesting teacher” (Cowley, 2006, p104).

Wakeling:- “Dancing on the edge” – approach can be key to being able to dance on the edge – due to the constant re-evaluation of what there was at the point of perception (Wakeling, 2012). By re-evaluating math based on student perceptions and approach to their core topics engagement should improve.

Applying these theories in maths classes by teaching learners practically and asking them to produce theory to accompany practical sessions allows the learner to develop, practice and present their functional skills. Learning by practice is an excellent way to absorb and embed new skills without learners being alienated by titles such as Math. This is using an approach very uncommon in traditional math session within secondary education.

Functional skills Literature

Functional skills qualifications currently form part of the GCSE syllabus sat at Key stage 4 and standalone qualifications that form parts of Foundation and Higher Diploma qualifications. “Importantly, functional skills are also helping to build learners’ independence and confidence”. (www.teachingtimes.com).

Wolf (2011) points out the inconsistencies in Functional Skills, such as the difference in assessment standards, the low pass rates to date and the lack of quality assurance between awarding bodies. Wolf places a large preference on GCSE qualifications it is a “crucial thing to recognise the central place of English and Maths GCSEs and the duty of post- 16 education to prioritise them” (Wolf, 2011) however she also states in her support for GCSE “for post 16 students that Functional Skills now represents 45-55% of the curriculum and this can only be a good thing” (Wolf, 2011). Wells, 2011 suggests using Functional Skills for a precursor or “jump start” to GCSE qualification at post 16. Due to the sectors acceptance of Professor Wolfs’ recommendations in full, it is likely that GCSEs will again become the norm for all learners. However Functional skills could form 55% of this qualification?

In contrast the White paper 2010 “The Importance of Teaching” sets out a “vision for a transformed school curriculum supported by rigorous assessment and qualifications” (Collins Education, 2011). GCSEs commenced in 1986 (The Open University) putting a returned emphasis back on these is not a transformation of schools curriculum. In Further Education many learners come to study vocational qualifications because they enjoy practical subjects, because schools structure and academic qualification have not had a positive outcome. Functional skills could play a role in re-introducing alienated subjects to learners. 1 year of classes in a subject can change student perceptions and gaining a qualification in what Wolf calls an “intermediate qualification”. Functional math could be a step in the right direction to reintroducing math GCSE to students who do not weight the topic.

If Functional skills could be used as the precursor for GCSE as it is (partly) in KS4 and taught over a year as a step up option perhaps it could have a place within the Educational system and be recognised as an equal or equivalent choice for vocational students.

Through- out the Wolf report in reference to Functional Skills nowhere does Wolf mention the link between Functional Skills and the progression to GCSE or does she make any suggestion on how student's should achieve their A*-C GCSE. Currently "almost half of all 16 year fail to achieve grade C at GCSE" (BBC News 2011), and "300,000 16-year-olds each year complete their education without enough understanding of math to function properly in their work or private lives" (Vorderman, 2011).

Functional skills future is undecided presently, so student engagement with it may help give courses merit, achievement and avoid the "Valueless" title given to key skills.

Engaging students may be achieved by incorporating practical relevant activities such as presentations, group exercises. This method can encourage group work and allow for learners to develop their own skills. The use of different practical props to complete scale drawings, map referencing, orienteering, building plans and the management of diets and feed substances will give the learners the chance to practice and embed their own numeracy skills. The use of both taught and practical sessions offers learners the opportunity to relate what they have learnt, therefore implementing their functional skills and introducing the use of the fundamental skill which should allow them to work independently.

Methodology

This section outlines the research design and the methods used in undertaking the study. Consideration is given to how the quantitative data was collated and analysed and the rationale behind the choice of methods.

The methodological approach is based on the aims and objectives of the study as well as the strengths and limitations of different approaches. The resources and the time available to the researcher were also factors considered in methodological design; this reflects the warning of Kane (1991), not to choose a topic which is too broad and to be clear as to the topic, defining the *"*major research words*"* to avoid difficulties at the later stages of the research.

A scientific approach to methodology will focus on quantitative analysis which Engel and Schutt (2005) state, "seeks to explain or describe a hypothesis or theory", "whilst the qualitative method is characterised by emphasis on subjectivity, description, interpretation and context" (Denscombe, 2003).
In considering the design of this action research project the advantages of using elements of both qualitative and quantitative methods were considered.

In selecting a research method "Researchers need to match the tools they use with the research questions and conditions they face – using quantitative methods for some studies, and qualitative methods for others,"(Rubin and Babbie 2001,45).

This study was concerned with collecting student's views on the Functional Skills math. A quantitative tool was developed which allowed students to respond anonymously. The questionnaire considered Denscombe (1998) who noted the advantages and disadvantages of using a research strategy like self-completion questionnaires.

The advantages include being able to generate a considerable amount of information at low cost , in a short space of time and without the influence of a

researcher, the disadvantages are poor response rates, poorly completed or incomplete questionnaire, respondents misunderstanding the questions or not replying truthfully, and not being able to explore answers further with respondents.

Sampling Procedure

Students taught by a range of mathematical teachers were asked to complete a questionnaire by their teacher (who may not have been the researcher), student where asked to read the questionnaire and to respond openly, honestly, personally and appropriately. From a further education college a cohort of 20% (66 students) where asked to complete the questionnaire randomly.

Self-Completion Questionnaire

The Questionnaire, attached (Appendix 1) was developed drawing on some of the evidence from the literature review. The questionnaire was designed to be user friendly, divided into sections with clear instructions. The lay out was well structured and uncluttered and presented in Ariel 14 font.

The questionnaire covered 9 vocational areas and explored factors relating to teaching methods used in these areas by different lecturers. It was primarily composed of pre-coded questions to facilitate the collation of quantitative data.

Once the questionnaire was drafted it was reviewed by several math tutors to make sure questions where limited in their leading nature and where clearly related to the topics under investigation. A Likert Scale was used for the questions as this scale presented students with statements and a range of five responses from “Strongly Agree To Strongly Disagree” thus allowing for views and opinions to be captured using a quantitative approach.

A final question provided students with the opportunity to express their views and opinions through the inclusion of an open ended question.

An idea to have discussion groups and student focused discussion where also primarily suggested, however based on the response to question focus groups where not used in the final results.

Method of analysis

The proposed method of analysis will be quantitative analysis through evaluation of data generated from the completion of the questionnaire. The data collated will be managed through Excel and the use of Statistical Package for Social Sciences (SPSS).

Research Ethics

Research ethics are “the method, procedure or prospective for deciding how to act and for analysing complex problems and issues (Resnik, 2012).

Connolly (2003) outlined key ethical principles for researchers:-

1. To conduct their professional work with integrity.
2. To respect the rights and dignity of all participants.
3. To ensure the well-being of all who participate or are affected by the research.

An additional factor which had a bearing on this study and the choice of method was the teacher student power relationship. It was considered that face to face interviews or focus groups may have provided fewer opportunities for student’s to express their views and comments naturally while responding to their tutor due to the student- tutor power relationship and students due to their inexperience and nature worrying about re-percussions. In the light of the student-teacher power relationship and the strength of the questionnaire response small discussion groups where not developed.

Researchers have a responsibility to ensure that research is carried out in a fair manner under the Human Rights Act and Equality legislation.

Other ethical agreements which all research should adhere to, are addressed below. (Babbie 2007:62-71).

Voluntary Participation: To avoid any element of coercion students choice as to whether or not to respond was entirely voluntary.

No harm to participants: The introduction to the questionnaire advised that the choice to either participate or not would not have any further implications for the student and tutor relationship.

Anonymity and confidentiality: The design also facilitated students responding anonymously this avoided issues in handling any personal characteristics. To adhere to good research practice in data collection and collation. The data was stored carefully in locked cabinet and only accessed by the researcher.

Results and Discussion

There was a 100% return on questionnaires, suggesting that students want to their opinions of functional skills math to be heard. The majority of skill areas that study math are represented in Table 1.

Table 1: Source of returns.

Main study area	Frequency	Percent
Motor vehicle	18	27.3
Motor cycle	9	13.6
Public services	6	9.1
IT/Business	1	1.5
Construction	20	30.3
Skills for work and living	1	1.5
Hair & Beauty	1	1.5
Catering	10	15.2
Total	66	100.0

The returns were not evenly divided across the genders, there were 55 (83%) from Males and 10 (15%) from Females, there was one return were this question was not answered. The ratio of male to female is 303:35 so the sampling response is an accurate measure of the gender representation studying math at the subject college.

There were a mix of age groups within the sample, with the majority, 63 (95%) being between 15 and 19 years of age, the breakdown of Age bands is presented in Table 2.

Table 2 Age band of students

Age band	Frequency	Percent
15-17 years	33	50.0
18-19 years	30	45.5
19+ years	2	3.0
No answer	1	1.5
Total	66	100.0

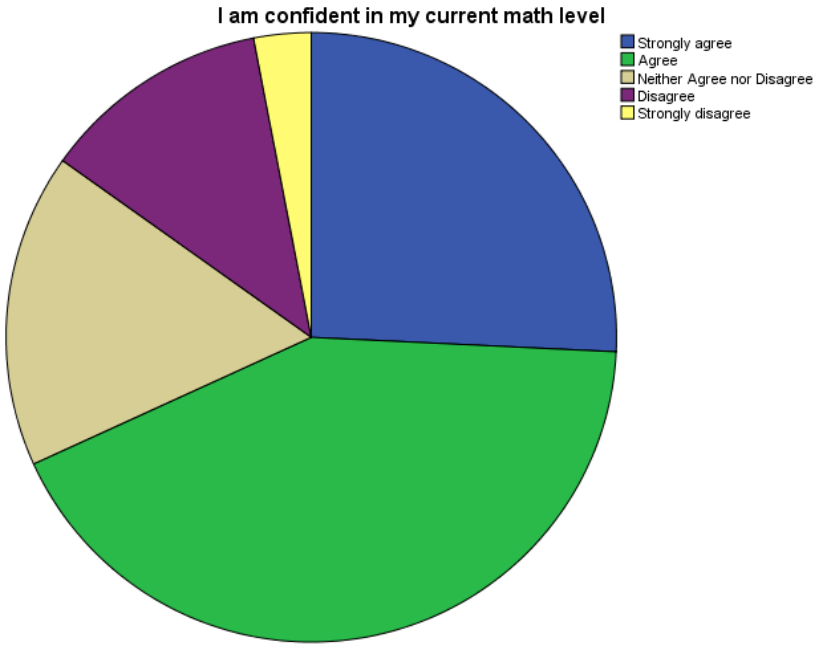
Students were also asked to report how long they had been studying at the subject College; the answers ranged from 1year to 9 years, in fact 9 students had been at the college for 4years or more. If we exclude these outliers the range of years studied fall to a minimum of 1 and a maximum of 3 for 57 students with a Mean = 1.75, Median = 2.

The questionnaire went on to consider how well students liked or disliked math and coupled with this how much, despite their view, their understanding of Math had improved. In response to their view of Math, 64 responses were obtained and of these 25 (39%) either Strongly agreed or Agreed that they liked functional skills math, while 16 (25%) Disagreed or Strongly disagreed, with 23 (36%) having no view either way. When considering whether functional skills math had improved their understanding, the views expressed hardened and from 65 responses, fewer students (16, 24%) expressed no view either way, while 33 (51%) Agreeing or Strongly agreeing that understanding had improved. There were 16 (25%) who Disagreed or Strongly disagreed (1 no answer). It would be tempting to believe that the 16 in each of
these groups where the same, however when they are cross tabulated findings show that only 11 are the same respondents, therefore students are generally more disposed to accept that functional skills maths has improved their understanding despite what they feel about maths itself.
The sample size and the nature of the Likert scale employed do not allow for this apparent difference to be tested for significance.
Students were asked how confident they felt about their current level of math. The results are shown in Table 3 and Figure1.

Table 3 : Confidence in current math level

I am Confident in my current Math level	Frequency	Percent
Strongly agree	17	25.8
Agree	28	42.4
Neither Agree nor Disagree	11	16.7
Disagree	8	12.1
Strongly disagree	2	3.0
Total	66	100.0

Figure 1 : Confidence in current math level

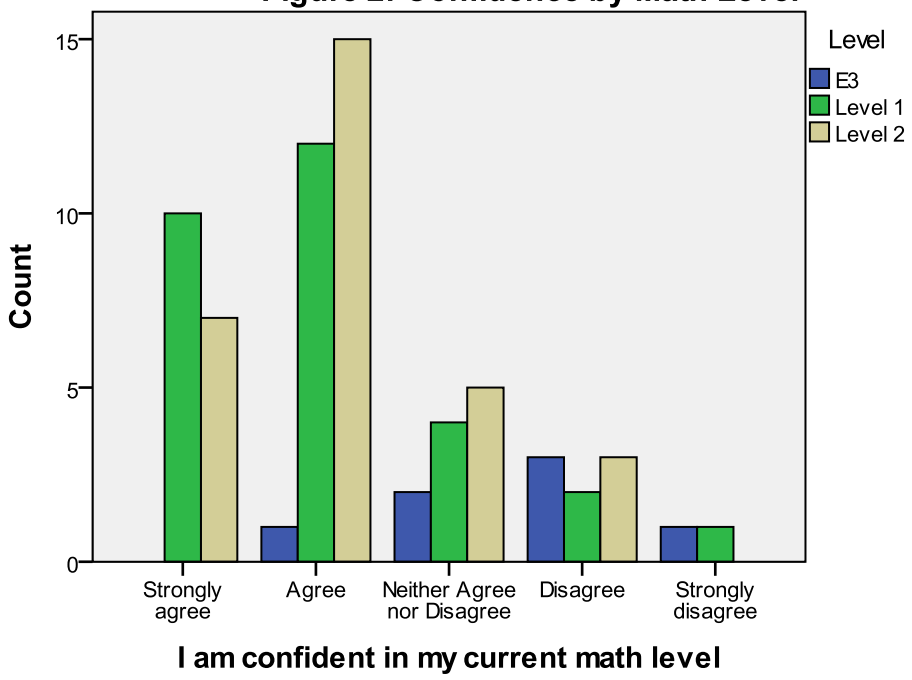


Forty five (68%) of students express confidence in their current level, while only 10 (15%) were not confident. The results were examined for any difference between genders, and no significant result was found.
When 'Confidence' is examined against the level of Math that a student is working towards an interesting, but weak trend emerges. These results were Cross tabulated and the results are presented in Table 4 and Figure 2.

Table 4: Confidence by Math level.

		Which level of math are you working towards			
		E3	Level 1	Level 2	Total
I am confident in my current math level	Strongly agree	0	10	7	17
	Agree	1	12	15	28
	Neither Agree nor Disagree	2	4	5	11
	Disagree	3	2	3	8
	Strongly disagree	1	1	0	2
Total		7	29	30	66

Figure 2: Confidence by Math Level



It is clear from Table 4 and Figure 2 that there is less confidence expressed by those students working towards ‘E3’, as 4 (57%) of 7 students at this level are not confident, and only 1 (14%) expresses some confidence. The numbers are small; however this finding should not be disregarded.

When considering the students view of whether a ‘practical element’ had been included in a math session, 60 (91%) said that they had, this is very gratifying. The questionnaire went on to consider if the student ‘Agreed’ that practical elements made functional skills maths easier to understand. In order to ensure clarity the analysis has excluded those students who answered ‘NO’ to the inclusion question. Two of the 60 students did not provide an answer to the next question and so the results are presented as a proportion of 58. Thirty four (59%) Strongly agreed or Agreed that practical elements made math easier to understand, 16 (28%) neither agreed nor disagreed, with only 8 (13%) disagreeing that practical elements of teaching helped. This result suggests a trend that practical math sessions are of benefit.

When considering responses as to whether the use of practical sessions is a good learning experience it is no surprise that of the 6 students who responded that they never had one (see above) 4 had no view and 2 ‘disagreed’.

A fairer reflection is obtained when considering the 60 students who did report having had practical learning examples. Of these 60, there were 3 who did not answer of the remaining 57, thirty four (60%) agreed that more use of practical examples would be a good learning experience, 15 (26%) expressed no view, and 8 (14%) disagreed.

Within the open-ended question where students could state their own comments, here are the responses.

Practical sessions (Q7)

“Helps educate”,
“Helps me understand”,
“Easier to learn”,
“Because it has a physical and visual explanation”
“Because you learn more easily and it stays in your head longer”
“It allows you to get hands on and understanding what you need for different types of skills”
“Understand on the Job”

General
“I found math as a subject hard but with the help of functional skills my understanding went up and I managed to pass level 2”

“At first lessons felt pointless but after the rest of the group became more involved the lesson improved”

“Did not like math but getting to like it now”

“I didn’t like math at secondary school but doing math here has given me a better understanding and more confident in my ability”
“I started off not very enthusiastic but it got quite interesting”

“It helped me understand math a lot more, I started I didn’t like math, now I enjoy it”

“Math isn’t a good course but the lecturer made it bearable and I learnt a lot over the course of the year”.

Thou not all student participated in the option to write general comments, those that did had an over welling positive response to learning improvements and an enjoyment in the course.

As part of the process it was decided to conduct a ‘joint practice development’ project with two vocational teams and two members of the Functional Skills team, alongside working with the learners in the Functional Skills lessons. The aim of the two pronged approach was to allow for the opportunity to foster a ‘positive’ working relationship between the vocational teams and Functional Skills, and enhance the importance of Functional Skills mathematics in the curriculum. Group meetings and development work was carried out to help build Functional Skills Mathematics into the whole of the curriculum of the two areas.

The focus of the collaborative approach between Vocational Staff and the Functional Skills Specialists proved to be an effective tool to reduce the resistance to change and improve team communications. The collaborative work has improved awareness of the content and role of Functional skills Mathematics in the two curriculum areas. The plans and activities produced by the collaborative team work mirror the Functional Skills curriculum and vocational areas with the aim to inspire an enjoyable teaching and learning environment for both the lecturer and the student in the next academic year.

Conclusion and Recommendations

This research project has shown that there is some merit in practical based classes and that these are supported and viewed well by the student body at the subject college. Students who study higher levels of math (level 1 and 2) seem to be more confident with their subjects, and have an understanding that math (whether liked or not) is a useful subject that has merit in their chosen Vocational area. The study has shown that the majority of students can differentiate between “what they like” and “what they need to learn”.

Based on student comments and quantitative research, this study supports the progression of practical based sessions in math and the use of Student centred learning.

Overall the project has been a success with the researcher gaining experience in research techniques a greater understanding of the literature associated with the topic investigated. The research itself has also provided the basis for the introduction of practical classes to the following year’s math Scheme of work, so a change has been implemented. Information was gained on both student opinion of maths as a fundamental skill, and the use of practical based activities and student centred learning to engage disillusioned learners with the topic. It is clear that most students have and understanding of math at their level and where they can apply this skill.

The values and views of the student where collected and evaluated although some results where surprising with 16 (25%) students not knowing that math was used in their own area.

The exam results for 2012 have a 34% increase in Passes across all levels of math after the first sitting, and in 2013 this did not decrease suggesting that the changes to the math ‘Scheme of Work’ to include practical sessions and apply these to situations where math fundamentals can be recognised in their own vocational area and exam questions seems to have been of benefit with increased success rates throughout the college.

To follow on with the project and improve it for the future, the questionnaire could be improved and re-issued to allow for a move conclusive set of answers, it could also be issued to a larger cohort of math students and at different times of the year possible (biannually) to gauge if changes in opinion take place through the year. To improve on the use of learner voice the questionnaire could be issued annually after the introduction of practical based topic to the SOW to see if each year students share the same opinion, this could be cross linked to achievement data to see if pass mark improve with the introduction to practical session or if there is a reduction in the need for re-sit examination with the introduction of practical student centred learning.

References

Edexcel. Edexcel (2009)

http://www.edexcel.com/quals/skillsforlife/alan/Pages/default.aspx

Site visited 10/11/09.

The Open University. Politics .co.uk GCSE.

http://www.politics.co.uk/reference/gcses

Site visited 11/06/2012

Guardian (2011). http://www.guardian.co.uk/education/2010/may/07/poor-literacy-numeracy
Site visited 24/05/12

Cook, T,D. (2003). Why have Educational Evaluators chosen not to do randomized experiments. Education Researcher. Dec.

Hall, B (2006). Explorations in Learning.
http://www.secondlanguagewriting.com/explorations/archives/2006/Jul/studentcenteredlearning
Site visited 14/05/2012

www.education.gov.uk, Site visited 14/10/2010

Blaszczky, D. (2011), www.ncfe.org.uk, Site visited 14/10/2010

Resnik, D. (2012). What is ethics in research and why is it important.

http://www.niehs.nih.Gov/research/resources/bioethics/whatis/

Site visited 21/05/2012.

Cybacat, (2008-2013). www.teachingtimes.com

Site visited 10/03/2013

Wallace, S (2007). Getting the Buggers motivated in FE. Continuum, 58-64

Cowley, S (2007). Getting the Buggers to Behave. Continuum 104-107.

Wolf, A (2011). A Review of Vocational Education. Government publication.

Vorderman, C (2011). A world-class mathematics education for all our young people: Government publication.

Wilson Linda. (2008). Practical teaching A Guide to PTLLS and CTLLS. London : Cengage learning EMEA p41-47

Lewin, K. (1948). Action Research and Minority Problems, New York: Harper and Row P 202-203

Bogdan, C. & Bilken, S. (1992). Qualitative Research For Education . Allyn and Bacon, Boston, MA,

Engel, R J. & Schutt, K R. (2005) The Practice of Research in Social Work. Thousand Oakes, CA, Sage

Denscombe, M. (2003). The Good Research Guide: for small scale social research projects, Buckingham: Open University Press.

Rubin, A. & Babbie, E. (2001). Research Methods for Social Work . Pacific. Grove, CA:

Denscombe, M. (1998). The Good Research Guide. Philadelphia, Open University Press. P45

Connolly, P (2003). Ethical principles for Researching Vulnerable Groups. Commissioned by the Office of the First Minister and Deputy First Minister. Northern Ireland.

Babbie, E. (2007). The Practice of Social Research, California: Wadsworth P62-71

Carr, W & Kemmis, S. (1986) Becoming Critical: education, knowledge and action research Lewes, Falmer Press.

Appendix 1

Functional Skills Questionnaire

Student Centred Approach to Math Functional skills

The below questionnaire has been designed to gather your opinion on Functional Skills math at NCS. The questionnaires are anonymous and should be filled in personally and be an honest view of how you feel about the practical topics you have been taken part in during this week.

Please read the below questions and note how you personally feel about Functional Skills Math.

Rating is 1-5,
1 = Strongly Agree
2 = Agree
3 = Neither Agree nor disagree
4 = Disagree
5 = Strongly disagree

Please Circle

1. Do you like Functional Skills Math at NCS?

NA 1 2 3 4 5

2. Despite your personal view of math. Has Functional Skills Math improved your use and understanding of math everyday?

NA 1 2 3 4 5

3. Are you confident in math at your current level?

NA 1 2 3 4 5

3b. What is the current level of math you are working towards?

E1 E2 E3 Level 1 Level 2

4. Has the use of a practical element made the class easier to understand and were **you** able to apply the theory from other sessions to the practical element of math?

NA 1 2 3 4 5

5. Do you use math in your main subject?

NA 1 2 3 4 5

and

Has practical math sessions allowed you to use math more effectively in your chosen area?

NA 1 2 3 4 5

6. Has the use of practical sessions (if you took part) helped with exam questions?

NA 1 2 3 4 5

7. Would you find the use of more practical session in math a good learning experience?

1 2 3 4 5

Why? (Please tell me)

8. Gender Male Female

9. Age 14 15- 17

18-19 19+

10. Which area do you study in?

Motor Vehicle	Construction	Hair and Beauty
Motor cycle	Art and Design	Catering
Animal Care	Sports	Travel and Tourism
Public services	Skills for work and living	
IT/Business	Music	Health and Social care

11. How many years have you been a student at NCS?

Any additional comments on Functional math, or the use of practical math sessions!

Thank you for completing this questionnaire, the results will be recorded anonymously and results analyzed to allow for the development of future math classes.