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MSc: Education, Technology and Society

Research Methods Assignment

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Dasher Software and the Creative Writing of Boys

The Researcher

I am a secondary school teacher working currently at a City Learning Centre in North Bristol. I graduated in Mathematics in 1996 and have taught Maths and ICT in secondary state schools for 7 years. My current role is to experiment with ICT across the whole curriculum and to implement projects across our 6 partner schools. I am a personal friend of designer of the Dasher software, David McKay, who is a non-profiting Reader of Natural Philosophy at Cambridge University.

Background and Rationale

When given a written task, I have often observed a significant difference between the production rate of boys and girls – both on paper and screen. Even recently, during some Year 9 email lessons with a partner school in Marseille, asked to write a few words about themselves as an introduction to their e-pal, many boys struggled to come up with more than a couple of sentences in the time girls had filled a side of A4. For some years now, the DFES has held the gender and learning question as a high priority. In June 2000, they implemented a specialist research project called "Raising Boys' Achievement" which addresses a broad spectrum of questions.

Dasher is a piece of software originally designed to enable those with poor motor-skills to type using a single input device such as a mouse or joystick. The program transforms the traditional notion of writing - the placing of one letter after another in a long line to form meaningful sentences, into a "journey through an infinite library of all the books that it is possible to write – not just the ones that have been written, but all conceivable books" (David McKay).

Having used the program myself, I believe it encourages both the production of and greater creativity within a written piece. Because it is a movement- and consequently a time-based activity, I feel compelled to write as a matter of urgency – rather than staring at a blank page, I am bombarded with a colourful alphabet that encourages writing. In addition, the statistically driven, predictive text feature gives hints as to possible successive words which often expand your horizon for potential sentences.

Creativity is a difficult term to define and whilst many suggest that it is largely dependent on context, originality, imagination and the value of the creation come out commonly as key elements of the concept. Others have been more precise in defining a creative event as:

"a shift in perspective or belief that makes new possibilities obvious" (Barlow, 2001),

"bringing together ideas that were previously unrelated" (Perkins, 1981)

"the process of producing something that is both original and worthwhile". (Sternberg, 1996)

Many have suggested that the current education system stifles creativity and I agree with John Crace's criticism when he argues: "Much of the writing we teach children is designed to kill creativity. Children are taught a model of writing based on a plan, discussion of a plan, first draft, discussion of the first draft and final copy; but that's just not the way it happens in reality. And yet it seems that no one has ever asked professional writers for their input on the writing process." (Crace, The Guardian, 2003). Nonetheless, for the purposes of this piece of research, I will use two measures of "creativity": The physical production of words as a pure quantity and adherence to National Curriculum statements for creative writing.

Research Question:

Can the Dasher software help boys to write "creatively" and thus raise their achievement in Secondary School?

Aims and Objectives:

The main aim is to discover whether or not Dasher can enhance boys' creative writing skills and thus improve achievement in English through ICT. If there are significant findings then I would hope to share these with Key Stage 3 teaching staff in Bristol and the DFES.

My Objectives are to find out whether:

1. Boys write more with Dasher than with a keyboard or Pen
2. Boys feel that what they have written is creative and if so how creative.
3. Writing produced with Dasher facilitates access to the National Curriculum Programme of Study. In particular, Strands En3: 1b and 1c which emphasise the use of:

    - Imaginative Vocabulary
    - Varied Linguistic and Literary Techniques
    - Language chosen for particular effects

Methodology

1. Sample

My sample will comprise 120 boys (120 is probably as large as I can go on a practical level and it is divisible by three which will be useful for my sub-groups later) from Key Stage 3, taken from a selection of secondary schools in Bristol.

I will choose 6 schools from the North Bristol Secondary Cluster as these will be convenient to work with as our partners and should provide a typical cross-section of the national population (these schools include those with GCSE results much higher than the national average and those much lower – i.e. not significantly affected by the low Bristol skew). From each, I will select 20 boys at random by taking all those on roll from Years 7 through 9 and choosing random pupil identification numbers to ensure no bias is inherited by school choice.

I will run a pre-test of the following methods using a sample of 12 boys from one school. This will be easy to organise and should help identify areas where the methods could benefit further tuning.

Pupils in the pre-tests and the actual research will be given a tutorial and practice session of one hour in the use of Dasher to minimise the potential for skewed results on the basis of lack of

understanding on how the software works or not becoming familiar with the new hand-eye coordination techniques required to use the package.

2. Methods

I will employ both qualitative and quantitative techniques. Objectives 1 and 3 lend themselves well to quantitative experimentation whereas 2 is best dealt with using qualitative measures. My mathematical background sways me towards a quantitative study and it may be argued that my definitions of creativity would be more accurately explored under a largely qualitative methodology.

2.1 *Objective 1 – Do boys write more with Dasher?*

This will take the form of a quantitative experiment which will measure the number of words the pupils produce in a given time limit. Ideally, we would like the only constraint on production to be the imagination itself but there are here physical limitations too which will introduce unwanted secondary variance. For example, some boys may find that the tool is unable to keep up with their normal writing or typing speed. You can, however, set the software to run at different speeds to suit anyone from a beginner to those producing around 40 words per minute. This alone will not solve the problem as there will still be those whose motor skills with a mouse/joystick operate at a different speed to their pen-and-paper or keyboard equivalent. Maybe this doesn't matter - after all, what I am looking at is the overall result – does Dasher help you write more?

To minimise variance within the subjects, I will use a "within participants" experiment and split the sample into 3 groups: A, B and C. Each participant will undertake three writing activities as ordered below:

As this is a quantitative subset of the overall research, I will hypothesise as follows:

Hypothesis 1:
Boys will produce more words with Dasher than with either of the other two methods.

Task	Group A	Group B	Group C

1	Pen and Paper	Dasher	Keyboard
2	Keyboard	Pen and Paper	Dasher
3	Dasher	Keyboard	Pen and Paper

To avoid repeated measures, three different writing tasks will be needed – this prevents pupils improving on their work each time.

Task 1: Write about yourself
Task 2: Write a fictional story on a topic of your choice
Task 3: Write about a holiday you once went on

All tasks will be allotted a 20 minute time limit. Pupils will perform the tasks with a 10 minute break between each in order to refresh their minds. I have chosen to do all the tasks on one day to maximise recollection within the interviews for objective 2 (see below). The 90 minutes for the tasks will span the period 10.15 am – 11.45am as I believe there is likely to be greater consistency in concentration over this period than any other 90 minute period in the day. This is based upon my own ideas and experience of when teaching and learning is most effective.

The independent variable here is the mode of writing (Dasher, Keyboard, and Hand) and the dependent variable is the number of words produced.

2.2 Objective 2 – How creative do the Boys feel?

For this part of the research, I will use a semi-structured interview which has several pre-determined, mainly open-ended questions for the boys to answer in small groups. I have chosen a small group setting as I believe it will encourage more responses - there is also an option for me to record individual responses within the group setting for some of the questions (e.g. Q.4a below). The aim here is to discover whether or not Dasher encourages and motivates creativity from the perspective of the pupils.

The questions will be:

1. How did it feel using the Dasher programme to write?
2. What do you think it means to write creatively?
3. Did you feel that your writing was creative in any of the tasks?
4. a) Did you feel more creative during any of the three tasks than the others? b) Why?

The interviews will take place after a break of 15 minutes following the third writing activity, at 12.00pm, and will last for 20 minutes.

I have made decisions about timings based on my own ideas of appropriateness from teaching children and the Dasher software itself. Whether an hour's practice on the program is enough is answered only by my own understanding of the package. It may be more effective to run a preliminary piece of research to establish what the average time would be to reach a certain level of "comfort" with using the program (possibly measured in words per minute).

2.3 Objective 3 – Does the Dasher software encourage writing styles necessary to achieve National Curriculum requirements?

Hypothesis 2:
Boys are more likely to employ written techniques required by the National Curriculum when using Dasher.

I will enlist the help of a group of English specialists for this objective and attempt to analyse each piece of writing against the National Curriculum statements. The specialists will highlight the number of occurrences the boys use any of the following three styles across the three modes (Keyboard, Dasher, and Hand):

- Imaginative Vocabulary
- Varied Linguistic and Literary Techniques
- Language chosen for particular effects

Clearly there will be an element of subjectivity here and I will attempt to minimise this by moderation across 3 staff. Prior to the analysis, the moderators will also discuss their ideas on what the three bulleted points might look like on paper/screen (this type of technique is already employed by teachers when they assess children's work for National Curriculum levels).

The independent variable again, is the mode of writing (Dasher, Keyboard, and Hand) and the dependent variable is the number of occurrences of the writing styles used.

3. Analysis of the Data

For objectives 1 and 3, I will obtain data in the following format:

Pupil No.	Objective 1 – No. of Words			Objective 3 – Occurrences of NC writing styles		
	Dasher	Keyboard	Pen/Paper	Dasher	Keyboard	Pen/Paper
1	34	26	40	3	2	1
2	25	50	17	7	0	0
3	67	123	100	12	6	13

For each data set, I will perform statistical analyses and attempt to deduce the general trends. A random sample of students will give rise to Normal distributions for the 6 data sets. I shall then calculate the Means, Standard Deviations and Variances for the first three (objective 1) and second three separately. I will perform t-tests and z-tests (resulting in p-values) on the Variances to establish the probabilities of the inferences drawn being reliable. If the p-values are less than ***0.05*** then I will be satisfied that the variances are reliable and conclude that the hypotheses are true. Otherwise, I shall declare null-hypotheses for the relevant data sets.

For objective 2, I will aim to illuminate the findings by projecting the pupil perspective on Dasher. It is possible that their responses to questions 1, 2 and 4b will lead to a thematic analysis but I will leave this until the responses are made.

In any event, I will attempt to write a series of statements to summarise the pupils' responses. These statements will either give support for the possibility that Dasher encourages "creativity" or they will suggest the contrary.

In question 4a I will be looking for direct responses which may lead to a more quantitative analysis. I will here make statements about the proportion of boys who suggest one mode over the others and the proportion that are indifferent.

Ethical Considerations

The designer of Dasher and Cambridge University will have access to all data collected as well as being provided with the overall report on findings. This is to enable them to be well informed to develop the software further.

Student participants will have the right to anonymity throughout the research and will be able to withdraw at any stage. Parents will be informed and their prior consent sought. Students and parents will be given information about the nature and purpose of the research but will not be told before-hand about the exact hypotheses and over-arching research question as this may influence the activity. Feedback will not be given on an individual basis – this could be seen as unfair when the objectives are not made clear at the outset.

Students and teachers will be able to access the report on completion of the research.

Teachers involved with objective 3 will be given a copy of the research plan prior to the pre-tests and will also have rights of anonymity throughout.

All other relevant teaching staff, such as Head Teachers, Pastoral Heads and Tutors related to the sample pupils will be informed of the research and have access to the reports derived. They will also maintain the right to withdraw individual pupils from the research at any time. The choice for any particular school to partake will lie ultimately with the Head Teacher.

Validity

Quantitative Elements:

I have measured here two variables against the three modes, Dasher, Keyboard and Pen/Paper. Firstly, the production level is measured by taking a simple word count at the end of the exercise. Production might, of course, be measured in other ways. It is all very well writing 50 words per minute but the words may have little meaning or be poorly composed. One might measure sentence length as an indicator of quality or sentence structure. Average word length may also indicate levels of quality production. The number of spelling mistakes, grammatical or punctuation errors could also be taken as a measure of production. Considering these approaches would increase the validity of my research.

To increase validity for the level of creativity would be difficult under my definition. Had I taken a wider view, it would be worthwhile asking professional writers to devise criteria for measuring a piece of text. Dividing the three styles (NC Statements) up for individual analysis could also provide a wider quantitative perspective.

Qualitative elements:

In order to triangulate around objective 2, it would be worth conducting observations of the children using the various modes. Particularly with the Dasher software as this may uncover problems that the pupils experience just because it is a new way of writing. Video data would here provide evidence in support of any anomalies in the data set.

There are other questions one might ask in order to give a wider perspective:

- Are results for girls the same?
- What about other types of writing, such as factual reports or translating from a dicta-phone?
- What happens with numerical or symbolic data entry?
- Does Dasher help those with particular needs such as dyslexia or dysphasia to write creatively?
- Is there an element of novelty-value about the software which influences the results? Would the findings be the same after many hours of use?
- Are the 3 writing tasks diverse enough to eliminate repeated measures whilst, at the same time, similar enough that none will specifically enthuse creativity*.
- What about speech-recognition? Is this more likely to replace keyboard input than a programme like Dasher?
- How does Dasher compare with PDA/Stylus text entry?

*E.g., some may argue that writing a fictional story with complete choice offers in itself a greater opportunity for creativity than writing about oneself.

Reliability

If significant discoveries are made for or against the hypotheses, it would be worthwhile trying to set up the same experiment in another part of the country or across a different set of schools in Bristol to see if similar findings arise. Provided all the external factors remain constant, such as time of year, time of day, age of subjects, comprehensive nature of subjects (i.e. from state schools), I cannot see a good reason why my experimental design wouldn't be reasonably validated by repeated trials.
The level of specificity for the qualitative aspects, are inherent in the methodology.

References

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