Relationships between students' learning style preference and exam achievement in differing forms of assessment during an advanced apprenticeship at a vocational Further Education College

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Abstract

How do you get the best out of an individual and what predictors are there for where further success can be obtained? This question is considered using quantitative methodologies to look for a relationship between the preferred learning-style of a group of students and the examinations they take to progress in their chosen career. It is done by looking at their initial learning preferences, as they join, and actual exam results, as they progress through a twelve-month course that culminates in the reward of an Advanced Apprenticeship in Communications Technologies. The results suggest there are underlying factors that need to be considered in greater detail and that the current methods of selection, which the Ministry of Defence relies on, give good value to the country and are capable of being developed even more.
Contents

1. Introduction
2. Literature Review
3. Research Question
4. Ethics
5. Method
   a. Participants
   b. Design
   c. Procedure
6. Analysis
   a. Correlation
   b. Descriptive
   c. Factor Analysis
   d. Position and Methodology
   e. Data Preparation
   f. Descriptive Statistics
   g. Inferential Statistics
   h. Factor Analysis
7. Discussion
8. Conclusion
9. Appendices
10. References
Introduction

How do you get the best out of an individual and what predictors are there for where further success can be obtained?

This question is becoming more and more relevant to business, sport and teaching as we look to spend money and time as efficiently and effectively as possible (Emerson and Loehr, 2008, Pinker, 1997, Roth, 2005). The best cognitive profiles and personality traits are needed for appropriate jobs and, once they’ve been aimed in the right direction, the return on investment needs to come as quickly as possible; preferably in volumes that increase as the individual develops and hones their personal skill set.

The population for this investigation is military students who live, as well as work together. This means their data will give a result that is relevant to the specific group, which will benefit the MoD and the taxpayer. If the information also supports existing feedback, it will strengthen the assumption that the statement is valid for the whole of the population.

The study is based in a further education college, where students live on-site; sharing each other’s company almost continually during the twelve months of their course. There are males and females ranging from 16 year-olds who come straight from school and living with parents, to 30 year-olds with wider knowledge of life, including higher qualifications, experience of work and maintaining themselves (sometimes spouses and children as well).

The varied starting-point is investigated at the point of joining by all RAF applicants, in the form of a multiple-choice psychology test called the Airman/woman Selection Test (Raf.mod.uk, n.d.), which is colloquially known as the AFCO test because they are conducted at local Armed Forces Careers Offices. It is broken into seven sections, which examine verbal, numeric and spatial reasoning, electrical and mechanical comprehension, work-rate and memory. The results indicate the trade the individual is best-suited to work in (Raf.mod.uk, 2001) and is used to guide the recruit, while
bearing in mind staffing levels, to give a positive result to all concerned. Unfortunately, the RAF states that the tests are “…strictly confidential and will only be used for the RAF recruit selection process”, so they are obliged to be ignored in later career decisions and are unavailable to teaching staff. The students at the school in this study train to be ICT Technicians (Raf.mod.uk, 2001), who will work worldwide with a wide range of complex communication, radar and information/ICT systems after they graduate.

As a result of this privacy, a VAK test (Visual/Auditory/Kinaesthetic) (Appendix A+B), based on a freely available Internet-based template (Businessballs.com, 1920), is given to learners in their first week in the school. There are many papers that have been written, concerning different measures of learning styles, often involving deep complexity. The main reason the VAK was chosen is that it is well recognised, straightforward and quick to perform, and its results are easily understood (Businessballs.com, 2012, Younger and Warrington, 2005). The intention of it is to give each individual an idea of their perceived favoured learning-style (Appendix B) and to encourage them to think on a broader level than simply passing exams. It is also designed to assist tutors by grouping scores for specific classes, using box and whisker and pie chart presentations (Appendix C+D). This reminds the teaching staff that there are many ways of educating to the desired levels of competence, and the combination of factors can be manipulated to achieve the appropriate effect efficiently. It may be possible to use more sophisticated measures, but the restrictions of time and money make it impractical and unnecessary.

The School is over ninety years old. It has developed to ensure that graduating students will be useful in their job as soon as they start; becoming increasingly effective as experience is gained. Students enter the School in Courses of between eight and fourteen individuals with between ten and sixteen courses running in any financial year, depending on the needs of the Ministry of Defence and the nation.
The qualification, taken over a one year course, is a Level Three Advanced Apprenticeship in Communications Technologies (Edexcel.com, 2012), which is awarded through the Qualifications and Credit Framework of the Skills Funding Agency (Qcf.skillsfundingagency.bis.gov.uk, 2012). This includes Key (now Functional) Skills at Level 2 in Communications (English), Application of Number (Maths) and ICT (Information and Communication Technology), with the BTEC (Business and Technology Education Council) National Award in Communications Electronic Engineering/Technology at Level 3 and the Communications Technology Professional Level 3 NVQ (National Vocational Qualification), which is completed in the workplace during the first posting, following graduation.

Records are kept of exam results in major exams that take place during the course. There are over eighty major exams to be taken, which combine with six written BTEC projects and various personal development tasks such as survival courses and charity assignments. There is an obligation to pass all the "major" exams which vary between written, practical and multiple-choice assessments. Failure to pass a major exam leads to additional training and a re-take; a second failure calls into question the learner's suitability for their studies. For this investigation twenty-five exams have been used, covering a range of aspects of the qualification and covering all three assessment styles. Exams that require a 100% passmark, such as health and safety, were excluded because they offer no appropriate information for this analysis.

The study investigates whether there is a relationship between students' preferred learning-styles and their exam results in different styles of assessment. It also considers any other relationships that imply exam performance relationships, which may indicate ability in a cross-functional skill-set (Cascio 1995, Nelson 1997, Pearlman 1997, Sanchez and Levine 1999).
**Literature review**

“In developing a balanced teaching style, the aim is that teachers should address students according to their learning styles, as well as challenge students to stretch their learning preferences” (Tavares, 2004).

I believe “Learning Style” should be defined as a stable preference that is used by individuals to effectively organize, then process and develop their understanding of any learning challenge, task or situation. Feldman (2004, p.35) states that “learning style reflects our preferred manner of acquiring, using and thinking about knowledge”. Barbara Prashnig illustrates it by diagrams and text (Prashnig, 2008), which supports multiple methods of learning and encourages the perpetrator of a student’s learning to consider the most effective methods of developing individuals, rather than thrown-together groups.

Other research that compares academic achievement with learning preferences has tended to relate to university (Ramirez, 2011) or school (Wilson, 2011; Kopsovich, 2001) education. As such, it is reasonable to query the validity of the research populations to the wider population; specifically those in further education (Light and Singer et al., 1990; Frey and Cissna, 2009). It has already been stated that there is no evidence that can be transferred into a Further Education context that is appropriate to the test population, the closest being architects (Bonnar, 2013).

Learning style analysis is recognised as a method for identifying the diverse needs of students as they congregate toward a common qualification (Dunn, Denig, and Lovelace, 2001; Felder and Brent, 2005; Hall and Mosely, 2005; Sternberg, Grigorenko, and Zhang, 2008; Williamson and Watson, 2007). However, Coffield states that “Learning style instruments are widely used but not enough is known about their reliability and validity and their impact on pedagogy in post-16 learning” (Coffield and Moseley et al., 2004)

There are many different definitions of “Learning Style”, all of which are helpful in expanding an
individual’s knowledge. However, with some going into a level of detail that is appropriate to doctoral publications, I decided it was better that the point of the School’s VAK exercise should be to excite our learners, who study at a level similar to A-Level (ie Advanced Modern Apprenticeship, at NVQ Level 3 (Gov.uk, 2013)); the intention being that they see themselves as *individuals* who have a personal skill-set that they can take responsibility for and receive the best advantage from, on their personal view of their needs. A difficulty of the VAK method of assessing learning style is that the investigator can tend to focus merely on an individual’s highest score (Kate, 2012), rather than take a holistic view of the individual that encourages them to develop and take advantage of their full skill-set (Appendix B).
The Research Questions:

1. Which Learning-style preference is the best predictor of scores in written exams within the School?

2. Which Learning-style preference is the best predictor of scores in multiple-choice exams within the School?

3. Which Learning-style preference is the best predictor of scores in practical exams within the School?

Assessment is claimed to be the 'life-blood' of learning (Rowntree, 1987) and by assessing we make inferences about our students' current and future performance (Freeman and Lewis, 2002). The investigation considers the effect of identifying learners' perceived abilities, in relation to their visual, auditory and kinaesthetic learning styles, in order to help guide and develop them and their tutors to maximise their abilities and desires.
**Ethics**

The ethical basis for obtaining, using and publishing this information is covered by the Helsinki Declarations of 1996 and 2008 (WMA, 2008). The data access has been obtained from the holder. It is confidential and anonymous thanks to the use of locked records and coding of participants, with the publication being anonymised to the client’s satisfaction.

Ethical approval for this project, including the research design and methods, was sought and received from the Officer Commanding No 1 Radio School, in December 2012.
Method

In order to give a complete snapshot in a restricted time, a quantitative method has been chosen. This investigates the achievements of Courses that have already graduated, so a complete set of data can be offered for each participant during the 54-weeks they were on their course.

a. Participants

160 students were chosen from a population of 172 who graduated between April 2010 and August 2012. Those who were excluded either had not completed all the exams in the course, had been exempt from some exams, or had declined to take part in the VAK test.

Of the participating students, nine were female (5.63%), which corresponded in the participant and non-participant categories. Owing to this being a small section of the overall sample, no differentiation has been made between sexes, to preserve anonymity.

There were ten learners (6.25%) who had learning difficulties that are recognised by the Ministry of Defence (Bowbrick and Moody et al., 2010; Ministry of Defence (UK), n.d.). These students were also integrated into the overall analysis, for the sake of privacy.

Mean age at the start of the course was 20.78 years, with a standard deviation of 3.18 years.
b. **Design**

The study is a relational discussion, where different methods of presenting the information to learners was divided into multiple-choice, practical or written. The exams and the VAK results were then examined to consider relationships between them.

c. **Procedure**

The procedure for gaining the data relied on investigation of existing archives. This meant there was no need to approach the individuals whose results gave the necessary information, which saved time. However, it was important to gain appropriate permissions from an authority that was responsible for the overall care of the School, its students and staff and the MoD as a whole. This permission was given by the Officer Commanding the School, on the condition of absolute anonymity for the participants. The records department produced the relevant information, which was extrapolated to match the VAK analyses and age-groups of participants before being further anonymised into the data that is presented here.
**Data Analysis**

The software used for this research is the IBM-owned program, SPSS (originally known as ‘Statistical Package for the Social Sciences’, Nie, Hull and Bent, 1968). It is a well-respected and powerful computer program that is used for a wide range of statistical analyses in business, government and academic research. The most up-to-date version of the software, version 21, has been used to obtain effective Correlation, Descriptive and Factor Analysis statistics:

- **Correlation** gives a single number that describes the degree of relationship between two variables (BusinessDictionary.com, n.d.). It will always fall between the values +1.0 and -1.0

  This correlation type is known as the Pearson Product Moment Correlation (Le.ac.uk, 2000), which is appropriate when both variables are measured at an interval level (ie. a data set where the units are the same size throughout the scale).

- **Descriptive** statistics are designed to give information about the distribution of variables (Le.ac.uk, 2000). SPSS allows a number of statistical procedures including: measures of central tendency, measures of variability around the mean, measures of deviation from normality, and information concerning the spread of the distribution. This investigation looks at the distributions for differing types of exams taken, which are split into written, multiple-choice and practical. It also considers the VAK distributions.

- **Factor Analysis** is a statistical term for any of several possible techniques that are used to obtain more useful variables from an original group of data (Field, 2009).

  In this investigation, the elements considered are the exams and the learner’s VAK predictions.

- **Position and Methodology**
The data is relational, to allow consideration of the interaction between various sets of information, using the aforementioned categoric and numeric data. It will investigate relationships between variables to see whether patterns vary significantly from chance and the effect of predictor variables (the VAK test) on outcome variables (exam results).

e. **Data Preparation**

The data were separated into three exams categories; written, practical and multiple choice and three most favoured learning styles; Visual, audio and kinaesthetic.

The data were then screened for anomalies and missing values. Two written exams on health and safety required 100% passmarks, so were excluded because their data was inappropriate to the format of this analysis. There were also a multiple-choice and a practical exam with multiple missing values from two complete courses, which also had to be excluded. The screening left complete data sets for two written, eight multiple-choice and fifteen practical exams.

The data were originally compiled in Microsoft Excel 2010 and then analysed in SPSS version 21, with information published to Adobe Acrobat 11 in Portable Document Format (pdf).
f. Descriptive Statistics

The Visual, Audio and Kinaesthetic scores were recorded in Microsoft’s Excel spreadsheet package as the learners joined the school. Table 1 shows the mean and standard deviation values for the investigation.

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<td>Mean</td>
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<td>54.23</td>
<td>67.46</td>
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<tr>
<td>Std Deviation</td>
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Table 1

The standard deviation was a similar value for all types of learning style, but the kinaesthetic preference shows a substantially higher mean and smaller standard deviation.

Figure 1 shows details of the exam results, broken into: a.) Written, b.) Practical and c.) Multiple-Choice. The box and whisker display indicates maximum and minimum values, combined with the median and inter-quartile ranges.
g. **Inferential Statistics**

Using SPSS, Pearson's correlation coefficients were calculated, with one-tailed significance, for VAK and all the written, practical and multiple-choice examination scores. This gave the opportunity to assess the contribution of the VAK scores to the variances that appeared in the exam scores.

The VAK scores showed a weak correlation, between 0 and ±0.3 (Clark-Carter, 1997) with all the exam scores. However, the VAK scores correlated significantly with themselves, as shown in Table 2:
There were moderate correlation coefficients between the exam scores shown in Table 3, which indicate those with correlations of more than 0.3.

Bonferroni correction (Bland, 2004) was not applied to the multivariate analysis due to the lack of moderate to strong correlation coefficients.

The initial research questions set out to identify whether scores on a student’s initial visual, audio and kinaesthetic learning preferences could be used as a predictor for their performance in written, practical or multiple-choice exams. The preliminary analysis of data indicates that the VAK scores do not offer significant predictions of exam performance.

However, the correlational analyses of the exam results data does suggest relationships between exam scores that may be explained by, as yet, unidentified factors. As a result, it was considered appropriate to perform Factor Analyses on the data to investigate whether
any of the exam results related to a covert underpinning paradigm. Basically; if learning style
does not explain examination accomplishment, what does?

h. **Factor Analysis**

The data used followed a normal distribution, which met the criteria for Factor Analysis to be
an appropriate method of research. The analysis was performed using SPSS v21 for
Windows, in accordance with the guidelines published in Field (2009). Dr Nils Beer states
that “…Factor analysis (FA) is a form of multivariate analysis and represents a data reduction
technique. The core objective of FA is to simplify multivariate data by reducing it to a smaller
number of underlying dimensions or components (factors)” (Beer, 2011).

Factor Analysis (Silva, 2009) was preferred to Principal Component Analysis (how2stats,
2011) because it was more appropriate, thanks to the assumption of error variance in the
data that could be due to multiple teaching methods delivered by varied instructors.

Additional risks include the manual inputting of data by the exam administration system.
Factor Analysis is considered a more cautious method of scrutiny; therefore it seemed the
most appropriate method to use.

Determinant analysis and examination of the correlation matrix indicated that there were no
issues of multicollinearity or singularity within the data (Field, 2005).

Kaiser-Meyer-Olkin test (Brownlow and Hunton et al., 2004), a measure of sampling
adequacy, revealed a value of 0.75. A value greater than 0.5 indicates that sample size is
adequate (see Table 4). Kaiser (1974) suggests that a value between 0.7 and 0.8 is good
and Factor Analysis is appropriate.

Bartlett’s test of sphericity (Brownlow and Hunton et al., 2004) was significant (p>0.001). A
significant test indicates that there are relationships among variables and when Bartlett’s is
highly significant (as in this case) Factor Analysis is appropriate (see Table 4).
KMO and Bartlett's Test

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | .747 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1206.203 |
| df | 406 |
| Sig. | .000 |

Table 4

No variables were eliminated at this stage.

29 factors were identified before extraction; these were various groupings of values from each of the 25 exams taken plus visual, audio, kinaesthetic and learner's age.

Factor 1 accounted for 19.42% of the total shared variance as shown in Table 5

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<th>Total Variance Explained</th>
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Table 5

Extraction reduced factors to the 9 most significant values, as illustrated by the scree plot of Eigenvalues (Sterling, 2009) and factors in Figure 2. SPSS shows the factors as components in this figure, but this is simply a quirk of the software. The cut-off point was defined by taking values of more than 1.0 as relevant, which was a conveniently significant number; however, the first 7 factors could also have been used.
Factor analysis was initially performed using an oblique rotation method because the examinations assess skill sets relevant to a particular trade and there were moderate correlation coefficients among exam scores. It would be expected therefore that factors would be related.

Factor Analysis highlighted 9 factors however, examination of the component correlation indicated that there were no meaningful relationships between variables and that it would be more appropriate to perform an orthogonally rotated solution to the analysis. This was not possible within the time restrictions of the project. Therefore, examination of the pattern matrix was conducted, in order to, at least, attempt to identify potential underlying factors that might be influencing performance in written, practical and multiple-choice exams, as well as learning styles. The pattern matrix following oblique rotation (Jennrich et al., 1966), which allows the factors to be related with one another, is shown in Table 6. The Kaiser normalization tends to decrease the standard errors of the loadings for the variables with small communalities and to increase those of the correlations among oblique factors.
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Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 20 iterations.
**Discussion**

The initial research question was which of visual, auditory and kinaesthetic learning styles is the strongest predictor of performance in written, practical or multiple-choice exams?

The evidence obtained from the data investigated suggests that there were no significant associations between learning styles and exam performance, but other elements may have an effect, which suggests the AFCO Airman/woman Selection Test (AST) may have more value than simply initial selection and staff could benefit from its wider use. However, random factors can correlate for, as yet, unknown reasons (Field, 2001), so further investigation will be required prior to forming an opinion on this. The AST is designed to define individual "trade abilities", which are confirmed by the groupings in the pattern matrix:

Component 1  Logical progression of thought in exams or personality.
Component 2  Logical reasoning.
Component 3  Enthusiasm for training or ebullience of personality, which may benefit from deeper assessment, such as 16PF (Pearsonassessments.com, n.d.).
Component 4  Systematic processing.
Component 5  All negative; suggests relationship to verbal ability and effective verbal communication.
Component 6  Non-verbal skills and processing.
Component 7  Non-verbal skills and manual dexterity.
Component 8  Experience gained or lost by advancing age.
Component 9  All negative; suggests relationships to kinaesthetic/visual and numeracy/concentration/processing.

All the components, with the exception of 3, illustrate differing aspects of logical, non-verbal skills, combined with the practical application of information. This supports the reasons that the students were selected for their career in the first place and confirms that the AFCO’s (Armed Forces
Careers Office) method of selection is appropriate. In addition, the exams that test the students’
ability while they are at the school, offer a wide and apposite interrogation of their abilities.
**Conclusion**

The project has offered a fascinating insight into the suitable and effective development of students by the School. They confirm a positive relationship between students' learning style preferences, but this relationship needs further investigation in order to establish the most effective ways of identifying effective methods of developing learners as individuals and teams.

The School has created a “Modern Learning” team that will have more time to work with the concepts that this paper has introduced and are already delivering Evidence-Based Training, which involves many more kinaesthetic and visual opportunities that benefit a wider range of learning styles.

The method of using completed courses for evidence has made sense, in terms of having complete sets of data for this paper, but it will need to be continued to allow a rolling database, which can identify the benefits or drawbacks of methodologies. Lao Tzu (604-531BC), the founder of Taoism, is credited with saying that “A journey of a thousand miles began with a single step” and it seems that step has been taken. However, it will need to continue if it has any value, and reflection and revision will be fundamental, as our experience develops.

These efforts confirm the determination that the School has to give value-for-money to the taxpayer and wider community (Gov.uk, 2011; Nao.org.uk, 1998).

The project has taken the lid off a can of worms that offers further opportunities for research to identify methods of obtaining effective and economic development benefits for students and staff. Future investigations will include study of the relationships that have been identified between subjects and exploration of the most effective methods of delivery for subjects that the analysis shows relationships between.
Appendix A

Questionnaire used to establish learners' Visual, Auditory and Kinaesthetic learning style preferences during an advanced apprenticeship at a vocational Further Education College

Below are a number of different tasks you may carry out as a normal part of your life... but how would you tackle each task?
1. Complete the answers
2. Fill in your details below
3. Press F12 & save it to your H: drive
4. e-mail it to keyskills.costford@googlemail.com
5. Within 24 hours you'll know your learning style, the best way to tackle your studies and have the first piece of evidence for your Key Skills portfolio!

In the boxes to the left of each answer, put either 0, 1 or 2 to show which is “never” (0), sometimes (1) or always (2).

Put whatever answer suits you. You can have 0, 1 or 2. It's the way you feel. Ask for help if you're not sure what to do, but please don't just guess.

<table>
<thead>
<tr>
<th>Task</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operate new equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travel directions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cook a new dish</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teach someone something</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What you'd say</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What you'd say...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faulty goods</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leisure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buying gifts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shopping</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choose a holiday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choose a new car</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Task</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Read the instructions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Follow my nose and maybe use a compass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Ask a friend for explanation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 Write instructions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 Know how you feel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 Tell me</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Watch how I do it</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 Send it back to the store</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Music and conversation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Books</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Try and test</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Listen to recommendations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Imagine the experience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Discuss with friends</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Name: ........................................
Number: ........................................
Course: .........................................
Appendix B

Feedback for learners' Visual, Auditory and Kinaesthetic learning style preferences during an advanced apprenticeship at a vocational Further Education College

<table>
<thead>
<tr>
<th>Learning Style</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Show me</td>
<td>38%</td>
</tr>
<tr>
<td>Tell me</td>
<td>35%</td>
</tr>
<tr>
<td>Let me</td>
<td>73%</td>
</tr>
</tbody>
</table>

**Visual (Show me)**
- involves the use of seen or observed things, including:
  - pictures
  - diagrams
  - demonstrations
  - displays
  - handouts
  - films
  - flip-chart, etc

**Auditory (Tell me)**
- involves the transfer of information through listening:
  - to the spoken word, of self or others
  - of sounds and noises

**Kinaesthetic (Let me)**
- involves physical experience:
  - touching
  - feeling
  - holding
  - doing
  - practical hands-on experiences

**Name:**

**Number:**

**Course:**

**Note:** The graph above shows percentages. Don't worry if they don't add up to 100% because you would have to be doing every option "always". Just look at the proportions, which will give you a guide to the best methods of learning & working, for you as an individual.
Appendix C

Illustrating how a student’s Visual, Auditory and Kinaesthetic learning style preferences relate to their course and overall school population for an advanced apprenticeship at a vocational Further Education College.
Appendix D

Feedback for teaching staff, showing course information relating to learners’ Visual, Auditory and Kinaesthetic learning style preferences during an advanced apprenticeship at a vocational Further Education College
References


Dunn, R, Denig, S, and Lovelace, M K. (2001.). Two Sides Of The Same Coin Or Different Strokes For Different Folks? Teacher Librarian


Science, University of Sussex. p.7. Available through: http://eprints.lib.sussex.ac.uk
http://eprints.lib.sussex.ac.uk/713/01/META-


Mark Fardon

I have worked as a Civil Servant for the Ministry of Defence since 2002, spending the last five years working in teaching positions at RAF Cosford in Shropshire.

My current role is “Subject Matter Expert” for End User Applications, which involves teaching new learners to use MS Office 2010 applications to a level where they can pass Microsoft’s “Specialist” qualifications. I also mentor and manage Functional Skills ICT at Level 2, having previously instructed and developed syllabuses for the Core Key Skills qualifications. I have also gained a reputation for being able to identify and assist individuals with Specific Learning Difficulties.

My research has had a positive effect on colleagues, by promoting interest in one-another’s exams and teaching practices. It has also developed student interest in broadening their methods of self-improvement and interactions between peers. I believe my future research, in this element, will offer further opportunities to obtain maximum effect for individuals, using effort that is focussed on their personal skill-sets.

While at Cosford, I have gained many qualifications, including:
- Certificate in Education
- Advanced Apprenticeships in Management and IT
- QTLS
- ECDL
- SKOPE (Practitioner Research programme pilot)
- MoD qualifications, including: mentoring, listening skills, interviewing, security and first aid
- Civil Service “Core Learning Programme” (Leadership, Talent development, Achieving policy outcomes, Implementing Government priorities, Core knowledge, Professionals in Government)

I am currently studying:
- British Psychological Society (BPS) Test User: Educational (Ability and Attainment) (formerly known as the Certificate of Competence in Educational Testing; CCET), at Birmingham University
- Coaching and mentoring Level 5, with the Institute of Leadership & Management

I have also gained City & Guilds Assessor qualifications and British Cycling’s Club Coach Award, both at Level 3. I am also part of Junior Chamber International (JCI), having been awarded a life membership for my work in the training and development of young people.

I believe that my determination to get the best out of people, combined with my enthusiasm for continually updating methods for obtaining and transmitting information effectively, will help me to develop successfully as a Fellow of the Institute for Learning and inspire the Members that I liaise with.