

Evaluation of Wirral Life
Education Centre
on the health and wellbeing
of primary school children

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Executive summary

Life Education is a national charity working locally with primary schools, parents and carers, and others in the community to help children make healthy choices. Wirral Life Education aims to help children make healthy choices by contributing to existing PSHE provision with their mobile classroom. The partnership between the school and the programme is a key component of the Life Education mission.

Wirral Life Education, as a charitable body, requires secure funding in order to achieve its' mission statement. Funding insecurities necessitate continually searching for support, however, the financial climate has been restrictive and suggestions have been made that to secure further funding, an independent evaluation of the effectiveness and value of Wirral Life Education is required. Additionally, the Life Education Centre (LEC) has reviewed its' current scope of work and wishes to expand both within and beyond Wirral, into neighbouring areas of Liverpool where high levels of deprivation and child poverty exist. In order to achieve this aim further funding support is required. Wirral Life Education has asked the Centre for Public Health, Liverpool John Moores University, to assist in the evaluation of their current programme in Wirral.

A fundamental aspect of the project was to assess the impact of LEC on pupils' knowledge at the schools. The pupils were asked to complete two tests (before and after the LEC session) to directly assess their change in knowledge on key issues (e.g. effects of smoking, implications of alcohol). One control and four test schools were used. Findings were augmented with an audit of teacher's and parent's thoughts on LEC.

The results are presented by year group (Year 3 and Year 5) with further analysis comparing the two year groups where possible. Significant improvements in knowledge were found between pre and post LEC sessions for five key questions in the Year 3 test groups. Further examination of these results, showed (table 2) that differences before and after the LEC session were more noticeable at some schools than others. Improvements were most noticeable regarding knowledge of the physiological harms of alcohol, and amount of daily exercise. The results from the Year 5 tests showed a greater number of knowledge improvements compared with Year 3. Data showed significantly improved knowledge on seven questions. The greatest improvements were seen for knowledge about the physiological harms of alcohol, amount of daily exercise, amount of sleep needed, assertive behaviour, effects of smoking, and social effects of alcohol. The size and significance of differences also varied by school. The design of the forms used in the project enabled some comparison between year groups. As expected, Year 5 pupils demonstrated greater baseline knowledge compared with Year 3's, prior to the LEC sessions taking place. The only area where this was not the case was the pupils understanding of the social impacts of alcohol, where a high proportion of pupils failed to understand how it causes harm.

Differences between the 'control' school and schools already having LEC were noticeable in Year 3 and Year 5 results. Year 3 pupils at the schools already having LEC showed significantly greater knowledge following the LEC session. Following the LEC session the Year 5 pupils at the experimental schools did make some improvements but there were still some areas where the control school out-performed the experimental schools.

The teacher's response to the LEC programme was overwhelmingly positive. None of the responses to the questions were rated lower than average with the majority rating the LEC as good (figures 22-29). Parents also responded positively to the LEC programme, and found the information on drugs/medications particularly useful.

Using more robust criteria for measuring changes in knowledge of children taking part in LEC provides evidence that the Wirral Life Education Centre does indeed supplement school-children's' knowledge, as well as endorsing previous qualitative studies evidencing their enjoyment of the mobile bus, and different learning experience. Teachers' endorsement of the LEC further indicates it is construed as a value-added activity in the school calendar. National and local requirements for developing strategies to endorse child wellbeing, highlighting the importance of improved knowledge of the harmful effects of alcohol and other risky behaviours strengthens the need for programmes such as the Life Education Centre in supporting the health and wellbeing of our nations' children. An experience in which they show a capability to learn due to the effective teaching style employed in the centre.

Acknowledgements

We would like extend our gratitude to all members of Life Education Centre, NHS Wirral, the primary school pupils and their teachers who took part, and Liverpool John Moores University who helped with this project. With particular thanks to Carol Gillam, Wirral LEC; and Linford Briant, research statistician, LJMU.

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1 Introduction

1.1 Background

The health and wellbeing of today's children and young people is essential for a healthy population in the future¹. Comparing the wellbeing of children in the United Kingdom to those across 21 other nations in the industrialised world, the United Kingdom has the worst levels of child deprivation; family and peer relationships; and behaviours and risks². The national Tellus3 survey recently documented nearly half of surveyed children reported bullying at school and over 40% felt it was not dealt with well³. Engaging in two or more health-risk behaviours such as smoking, alcohol, drugs, and risky sexual behaviour predicts psychological distress and depressive symptoms⁴. By the time children reach adolescence, risky health behaviours cluster placing children at risk of binge drinking, violence, sexual risk-taking, and sexual victimization^{5,6,7,8}.

The government Public Service Agreements (PSAs) have set out a vision for improving the physical, mental and emotional health of all children for the next three years⁹. PSAs will focus on: prevention and early intervention; enabling children, young people and their families to make healthy choices; to increase the number of children on the path to success; and to promote better health and wellbeing. Since young people spend more than one third of their waking hours in school, the National Healthy Schools Programme is instrumental in promoting the link between good health, behaviour and achievement. Four core themes of Healthy Schools are Personal, Social and Health Education (PSHE), healthy eating, physical activity, and emotional health and wellbeing. The whole school approach involves working with children and young people, parents, school staff, and the whole school community to bring sustained improvements in behaviour, standards of work and school management.

Effective health and drug education helps children and young people to make informed choices. There are indications that 'drug education has a role to play in reducing the risks associated with drug use, reducing the amount of drugs used and helping people to stop'⁹.

The Government has produced guidelines on how to help improve the health of young people. The Choosing Health White Paper¹⁰ produced in 2004 contained a specific focus upon young people, in line with the Every Child Matters (ECM) recommendations, and recognises that 'emotional wellbeing underpins good physical health and reduces the likelihood that children and young people will take inappropriate risks'. To this end the White Paper states that:

- extended schools can also provide, for example, One Stop Shops and multi-agency health centres located on a school site, which will enable health professionals to work alongside education and social care professionals;
- personal health guides (PHG) will encourage young people to build health into the way they live their lives;
- general information, advice and support about health issues, as well as emotional wellbeing, puberty, sexual health and access to further help and advice will be provided, for example, through a confidential email service;
- learning about health choices and managing risk will be supported, for example, through incentive schemes using reward points.

There are many health and wellbeing concerns of young people throughout the country, and this is often amplified in the North West of England due to the higher levels of deprivation. For example, obesity is moving toward epidemic proportions. Data from north-west England estimate 17% of children starting secondary education are already obese¹¹. Obese adolescents are at greater risk of Type 2 diabetes, limb amputation, heart disease and

cancers, and a potential risk of death before their parents. Data generated from the government funded Foresight consortium on obesity predict that half the UK population (and a quarter of all adolescents) will be obese within 25 years unless 'drastic' action is taken¹². A bold whole-system approach, with a broad set of integrated policies to enhance wellbeing, is required to counteract today's 'obesogenic' society. At the same time, anorexia and bulimia have increased in both genders. Eating disorders are the third most common chronic condition in adolescent girls. Anorexia is precipitated as a coping mechanism against transitions, developmental challenges, academic stress, family conflict, and has associations with obsessive perfectionist families and with autistic spectrum traits¹³. Adolescent weight-teasing predicts binge eating in boys and frequent dieting in girls over many years¹⁴.

An equally important public health issue concerns alcohol abuse by young people. Alcohol use and pervasive bingeing (5 or more drinks per session) are entrenched within youth culture, creating one of the greatest challenges to UK public health in recent years^{15,16}. Young teenagers in the UK are more likely to get drunk than anywhere else in the industrial world, with girls in particular pushing up the level of drunkenness¹⁷. A national study reported 52% of 11-15 year olds have drunk alcohol, including 16% of 11 year olds¹⁸. While this is a drop from 61% in 2003, between 2007 and 2008 consumption in those drinking rose 15% to 14.6 units with the greatest rise in 11-13 year old girls (63%). North West England represents an area with heavy drinking and high levels of alcohol-related harm¹⁹. Surveys report a third of 15-16 year olds binge drink weekly⁵, and alcohol-related hospital admissions are the highest in the country¹⁹.

The government is developing strategies to enhance child wellbeing in the UK²⁰. Wellbeing is defined in law in terms of the five ECM outcomes be healthy, stay safe, enjoy and achieve, make a positive contribution, and achieve economic wellbeing. Ofsted already inspects schools to assess these indicators, and the government now wishes to further promote the role of schools in supporting child wellbeing through the Children's Plan (the 21st Century School)²⁰. Practical ways of promoting wellbeing through schools (using the five ECM outcomes) include:

- Enjoy and achieve: effective personalised learning, enhanced tailored curriculum, early identification and intervention with behavioural problems, improved transitions, full access to educational opportunities, reduce vulnerability to exclusion, offer wide range of out of school activities;
- Being healthy: delivering effective health education through PSHE with input from health professionals, on site health facilities, ensure pupil awareness of support services, promote healthy school environment, have supportive school ethos;
- Staying safe: have system to identify vulnerable children, develop standards for child safety, monitor and deal with bullying, manage absences, assess risk and build resilience, effective management of exclusions and missing children;
- Making a positive contribution: provide array of in and out of school activities, deliver quality citizenship and RE education, support cultural sharing, develop culture of respect;
- Achieve economic wellbeing: develop employment skills and work experience programmes, enhance employment advice, improve children knowledge of finances, provide access to childcare and services.

A small number of quantitative indicators for pupil wellbeing for each ECM outcome will be collected along with schools own individual self-evaluations. It is essential, therefore, that schools utilize every opportunity available to enhance their pupils' wellbeing and their knowledge of social and cultural factors that can improve their daily lives.

1.2 Wirral

The population of Wirral is estimated to be around 312,400 with 96% of people classified as 'White British'. Currently there are 41,928 young people aged between 10-19 years of age, 51.4% of whom are males. The number of people in this age group is predicted to fall by 9% by 2011, with a continuing downward trend until 2026.

Index of Multiple Deprivation (IMD) scores suggest a mixture of wealth and deprivation, ranging between 62-78 in north and west Wirral to between 2-12 in east Wirral (see Figure 1). Nearly a third (30.0%) of children aged 0-15 years are living in low income households (2001) which is higher than the North West (25.3%) and England (21.3%)¹⁹. Wirral also has a higher rate of looked after children aged between 0 and 17 years of age (Appendix 1), with a rate of 89 per 10,000, higher than the average for the North West (69) and England (54); the range again varies between wards¹⁹. There is a high level of absence from primary schools in Wirral compared to the rest of the North West. Wirral has a significantly worse than regional average rate of males and females aged under-18 requiring hospital admissions for alcohol specific conditions¹⁹. Overall the amount of children and young people defined as not in good health is significantly worse than the rest of the region.

The TellUs 3 survey for Wirral²¹ showed results relating to the five ECM outcomes (see above). Although the survey included young people up to 17 years, one third of the sample consisted of children aged 8-11 years. Under the 'Being Healthy' outcome, Wirral young people showed they do not eat enough fruits and vegetables each day. The result showed a significantly fewer amount than the national average ate the recommended 5 or more per day. A further negative result for Wirral showed that significantly less young people, than the national score, had never been drunk. There were however, some positive results for Wirral under the 'Being Healthy' outcome. These included significantly less children worried about bullying than compared to the rest of the UK, and significantly more young people did not worry about anything.

Further positive results were revealed in the 'Staying safe' outcome, with lower than nationally average rates for being bullied or knowing someone who has been bullied. This was further emphasised in the result showing the young people felt their schools dealt well with the problem of bullying. The 'Enjoying and achieving' outcome produced mixed results with the young people showing significantly less effort in school than the rest of the UK, however the young people felt help was easily available if they required it. Young people evidently felt a sense of ownership of their schools by scoring significantly higher than the rest of the UK when asked if they had a great deal of input into the running of the school. In the final outcome, 'Achieving economic well-being', the young people showed a lower level of academic ambition than their peers in the rest of the UK. A significantly less amount of young people planned to go to university once they had finished school.

1.3 Life Education

Life Education is a national charity working locally with primary schools, with parents and carers and others in the community to help children make healthy choices²². Life Education has 43 local operating groups that reach about one million children. Life Education aims to help children make healthy choices through a series of high quality, evidence-based programmes delivered directly to children and parents in partnership with primary schools and in the community. Life Education's work in schools contributes to existing PSHE provision including achieving agreed learning outcomes which are delivered via high quality services for pupils and teachers at the Foundation stage and Key Stages 1 and 2.

Wirral Life Education, a charitable programme in North West England, aims to help children make healthy choices by contributing to existing PSHE provision with their mobile classroom. The partnership between the school and the programme is highlighted a key component of the Life Education mission (Box 1). Changes in knowledge, attitudes and behavioural intentions are Life Education's objectives; these occur over time and need to be reinforced on an ongoing basis in order to become the foundations for any behaviour change that could take place much later.

Box 1

Mission Statement: Wirral Life Education Centre²¹

To work in partnership with schools and engage with others in the community to help children make healthy choices by:

- Contributing to life skills and health education programmes;
- Educating children about the effects and risks associated with the use of drugs, including alcohol and tobacco;
- Working with and supporting parents, carers, teachers and others in the community in communicating healthy lifestyle messages effectively.

A previous evaluation completed by the Life Education Centre (LEC) in 2008 found that the teachers sampled thought the Life Education programme was good or excellent, and that the centre was a valuable resource²². Teachers recognised that the programmes complimented the science and PSHE&CE curriculum, but also helped to reinforce the work the schools do to achieve their Healthy Schools Status, and complimented the SEAL programme. Teachers felt the LEC helps them to deliver lessons particularly about healthy living, helping children to remember the work as it makes an impact. Teachers were happy to involve their classes every year so that each child could benefit from an annual visit, which reinforced and built on the previous visit.

The same evaluation by the LEC found that 85% of the pupils rated the LEC as 'good', and most would like to visit the LEC mobile bus again. The pupils said it helped them to think about healthy living in a variety of ways:

- They thought more about healthy diets and lifestyles, particularly the need for exercise, a healthy diet and plenty of sleep.
- They thought about unhealthy choices, particularly smoking, drinking and the use of illegal drugs, but also the importance of using medicines safely and asking an adult for help.
- They recognised the importance of emotional health and being able to make their own choices rather than being persuaded by friends.

In 2007/08 the mobile bus visited 56 Wirral primary schools, teaching 12,691 children between the ages of 4 and 11 years of age in age-appropriate programmes. Areas visited included those considered to be most disadvantaged in Wirral. Additionally, 117 parents attended sessions designed to inform and encourage them to help their children make healthy choices.

Wirral Life Education, as a charitable body, requires secure funding in order to achieve its' mission statement. Funding insecurities necessitate continually searching for support, however, the financial climate has been restrictive and suggestions have been made that to

secure further funding, an independent evaluation of the effectiveness and value of Wirral Life Education is required. Additionally, Life Education has reviewed its' current scope of work and wishes to expand both within and beyond Wirral, into neighbouring areas of Liverpool where high levels of deprivation and child poverty exist. In order to achieve this, further funding support is required. Wirral Life Education has asked the Centre for Public Health, Liverpool John Moores University, to assist in the evaluation of their current programme in Wirral.

2. Methodology

2.1. Aim of study

To provide an independent audit on the Wirral Life Education lessons by evaluating if it improved the knowledge of school children, with particular reference to PSA indicators. Also, to audit teacher's and parent's thoughts of the LEC.

2.2 Evaluation methods

School Population

Schools that were due to undergo Life Education Centre (LEC) activities, through their mobile bus, between May and July 2009 were identified. Amongst these, six schools were available and representative of a range of Index of Multiple Deprivations (IMD) scores across Wirral. Figure 1 illustrates the location of the schools in relation to their deprivation score. It can be seen that the schools included in the study range from locations in highly deprived areas to areas of less deprivation. Only children already due to participate in the Wirral Life activities were considered. Primary school children in these schools, in Year 3 (Y3; aged 8 to 9) and Year 5 (Y5; aged 10 to 11) were defined as most able to complete the Life Education audit test whilst reflecting their early and late exposure to lessons over the years. Year 6 were excluded because of SAT exams. In total, 452 children participated in the pre-planned standard Life Education lessons in their mobile bus. This consisted of 213 children in Year 3 and 239 in Year 5. The sample included a control group of 99 children (Y3 $n = 51$; Y5 $n = 48$) who had never had a lesson in the Life Education mobile bus.

Other

Five teachers (Y3 $n = 2$; Y5 $n = 3$) across three of the five schools agreed to participate in the audit. Twenty-five parents (Median age = 30-39 years; female $n = 23$; 92%) of the school children were also included in the evaluation process.

2.2 Location of schools

School A is located in an area of low deprivation and has approximately 220 pupils. Many pupils who attend this average sized school come from relatively advantaged White British backgrounds. The school is designated by its local authority to cater for pupils with medical or physical impairment. Because of this there is a higher than average proportion with a statement of special educational need. Otherwise, there are a lower percentage of pupils with learning difficulties and/or other disabilities. Ofsted rated the school as good overall.

School B is located in an area of moderate deprivation and has approximately 450 pupils. It is a large school serving an area of relatively high social disadvantage. A well above average proportion of pupils are entitled to free school meals. The proportion of pupils with learning difficulties and/or disabilities, including those with a statement of special educational needs, is above average. Almost all pupils are White British with few from other ethnic groups. Ofsted rated the school as good overall.

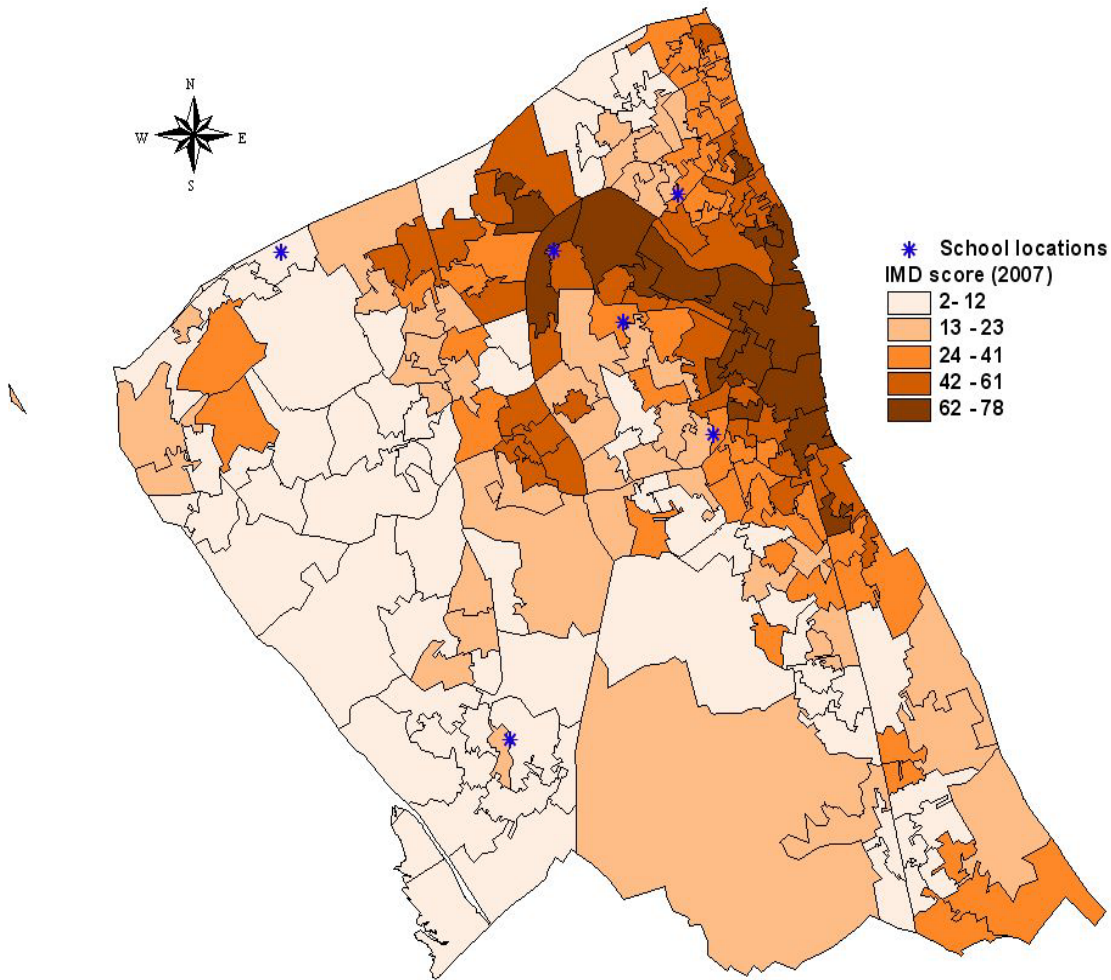


Figure 1. IMD LSOA Wirral, school locations

School C is located in an area of moderate deprivation and has approximately 250 pupils. Most pupils at this average sized school come from White British backgrounds, with small numbers from a minority ethnic background or who use English as an additional language. The school is sited in an urban area of considerable disadvantage. The proportion of pupils with learning difficulties and/or disabilities or who are entitled to free school meals is well above average. Ofsted rated the school as good overall.

School D is located in an area of high deprivation and has approximately 320 pupils. It is a larger than average primary school. It serves an area with a high level of social and economic disadvantage. A high proportion of pupils are eligible for free school meals. No pupils are from minority ethnic backgrounds. The school has a higher than average proportion of pupils with learning difficulties and/or other disabilities. Ofsted rated the school as good overall.

The control school is located in an area of low deprivation and has approximately 400 pupils. This is a much larger than average primary school. Its local area is socially advantaged although the school also draws its pupils from a wider area that has a broader range of circumstances. The vast majority of pupils are White British. None are at the early stages of learning English as an additional language. The proportion of pupils with learning difficulties and/or disabilities is below average. Ofsted rated the school as good overall.

2.3 Measures and tools

Knowledge test for school children

The principal method of the audit was a simple knowledge test developed by researchers at the Centre for Public Health, Liverpool John Moores University in conjunction with Life Education staff. Separate test forms were developed and used for Y3 (see Appendix) and Y5 (see Appendix). Forms were limited to examining knowledge that had been taught in the Life Education lesson, and did not ask any personal questions relating to the individual child, their attitudes, or their behaviour. These lesson knowledge tests were modelled on previously existing forms and were piloted to ensure questions were age-appropriate to the Life Education lesson.

Audit with parents

An audit form used for parents (see Appendix) in the study again asked no personal questions and focused specifically on parent's opinions on the value of Life Education activities for parents.

Audit with teachers

A pre-existing form developed by the Life Education Centre (see Appendix) was used to guide the semi-structured interviews with teachers. The semi-structured interviews included a series of questions that required a response on a 5 point scale anchored with 'Poor' through to 'Excellent'.

Procedure

Pupils

The lesson audit forms were piloted at a school in Wirral following the initial development. The pilot school was located in an area of moderate deprivation and rated as good by Ofsted. The form was piloted with both year 3 and year 5 pupils and provided valuable insight into wording and layout of the form. A copy of the form was given to the pupils prior to the Life Education session by the Life Education teacher. The pupils were then asked to fill in the form following the Life Education session. The forms were revised and finalised for use on a larger sample following this feedback.

Four schools were identified as the experimental group and were selected based on level of deprivation in the surrounding area and predetermined timetabling with Life Education. A control school was selected based on willingness to participate and not having had any Life Education sessions before.

At each of the experimental schools, the form was given to the pupils by the Life Education teacher prior to the start of the session. The sessions took place on the Life Education bus and the pupils were given the form to complete whilst in a classroom immediately prior to visiting the bus. The pupils were asked to complete the test forms independently and that there were no penalties for incorrect answers. Once the session had finished and the pupils had left the bus, a new test form was given to the pupils by the Life Education teacher and the pupils were again asked to complete the form in a classroom. When the pupils had finished completing the second form, both tests were collected from the pupils and stapled together. A small letter 'b' was placed on the top of the form completed before the Life Education session to further ensure accuracy of the data when being entered. This procedure was completed for all year 3 and year 5 pupils at all experimental schools and the control school. The procedure was similar for the control school, with the pupils being given

the test form and asked to fill it in independently. The form was collected after all the pupils had completed all the questions.

Teachers

Arrangements were made to visit a year 3 and year 5 teachers at three of the experimental schools. The teachers were questioned about the Life Education program using a semi-structured interview with a basic questionnaire. It was only possible to sample a total of five teachers in the study. The teachers were visited at their school.

Parents

Parents were sampled at two schools that had previously run the Life Education session. Parents who were interested in completing the questionnaire were asked to complete the form after attending a workshop ran by the Life Education teacher.

Data analysis

Data were entered into a statistical package (SPSS v15) for analysis. Analysis included frequency of each variable at both pre and post Life Education session. This allowed for presentation of percentages of correct answers before and after the session. Further, t-tests were run to explore differences between pre and post scores using all year 3 data. Similar t-tests were also run using all year 5 data. Further analysis explored differences between each individual school used in the project which was used to see any differences between schools, including any possible effect of IMD score on results. Data were also analysed to examine differences between control school and experimental schools. Where possible, data were analysed for presentation in histograms to visually demonstrate changes in knowledge. Finally, data collected from teachers and parents were analysed to show frequency of answers.

3. Results

3.1 Year 3

Data were analysed to show the percentages of correct answers for each question before the Life Education session and afterward. Table 1 shows the results of all pupils sampled from Y3 from the four experimental schools. Figures 2-10 show the percentage of correct responses pre and post LEC session by year 3 pupils at the four experimental schools. Paired samples t-tests were used to determine statistical differences between the answers of each question before and after the Life Education session.

Table 1. Percentages of correct answers before and after the LEC session in all Y3 pupils. (Statistically different results shown with further information)

	PRE	POST
QUESTION		
1) What colour are peoples lungs when they smoke cigarettes?		
Black	87%	98%
	$t(158) = 4.088, p = .000$	
2) How many fruit and vegetable portions should people eat every day?		
Five	86%	88%
3) What are the five things that everyone needs to stay alive?		
Air	94%	96%
Drink	96%	96%
Sleep	88%	91%
Food	97%	97%
Exercise	72%	78%
4) What happens when people drink alcohol?		
They do dangerous things	86%	90%
They forget things	73%	75%
5) What parts of the body are most affected by drinking too much alcohol?		
Liver	45%	68%
	$t(157) = 4.893, p = .000$	
Heart	69%	51%
	$t(157) = -4.058, p = .000$	
6) How many hours sleep should you have every night?		
10-12 hours	53%	67%
	$t(157) = 3.428, p = .001$	
7) What should you do if another child nags you?		
Speak to a teacher or parent	75%	72%
8) How much exercise should you do every day?		
60 minutes	30%	61%
	$t(157) = 6.673, p = .000$	
9) What dinners are best for your body?		
Ham salad	79%	77%
Salmon, broccoli, and rice.	83%	85%

Figure 2. Percentage of correct answers for question 1 by Y3 pupils at all experimental schools pre and post Life Education session.

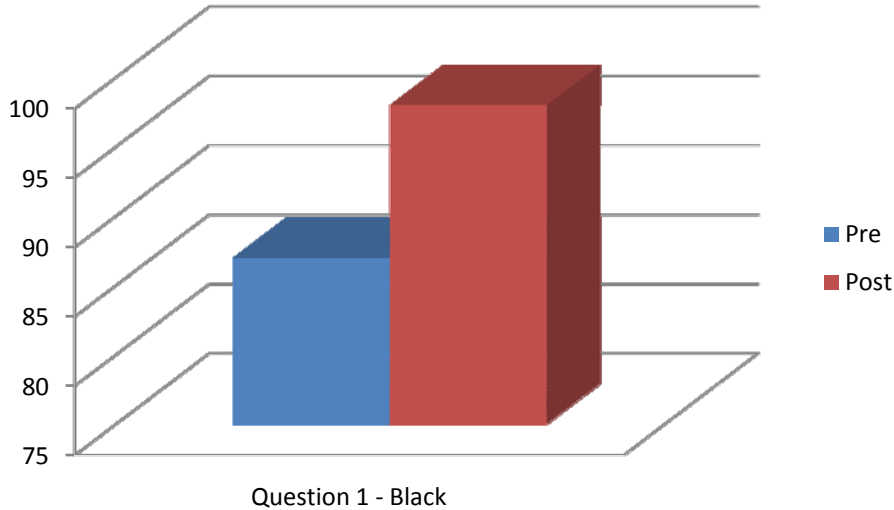


Figure 3. Percentage of correct answers for question 2 by Y3 pupils at all experimental schools pre and post Life Education session.

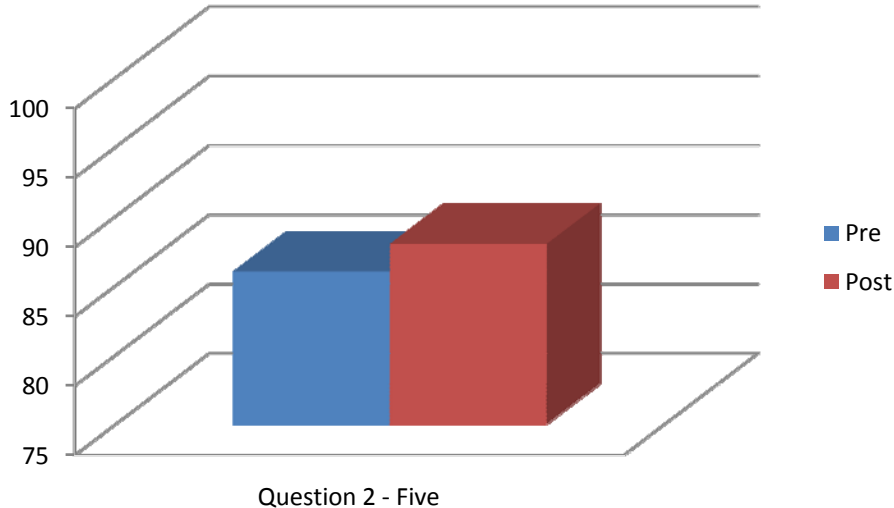


Figure 4. Percentage of correct answers for question 3 by Y3 pupils at all experimental schools pre and post Life Education session.

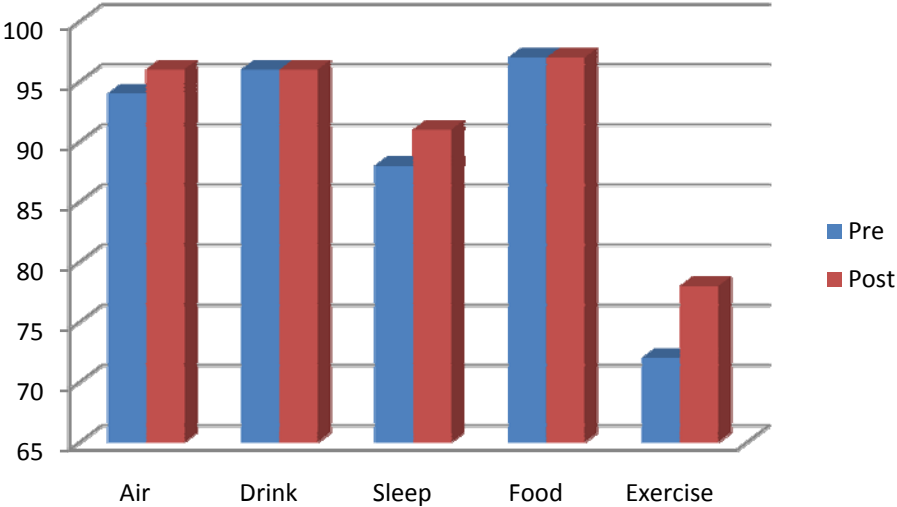


Figure 5. Percentage of correct answers for question 4 by Y3 pupils at all experimental schools pre and post Life Education session.

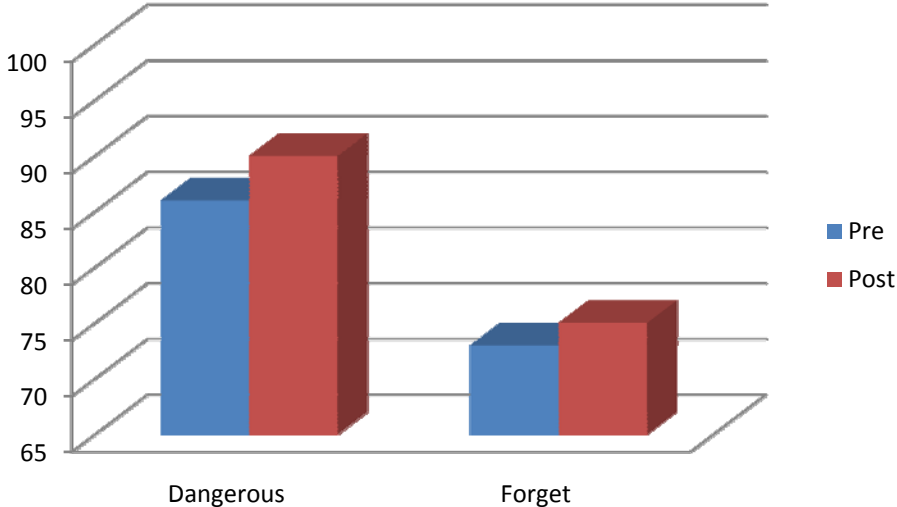


Figure 6. Percentage of correct answers for question 5 by Y3 pupils at all experimental schools pre and post Life Education session.

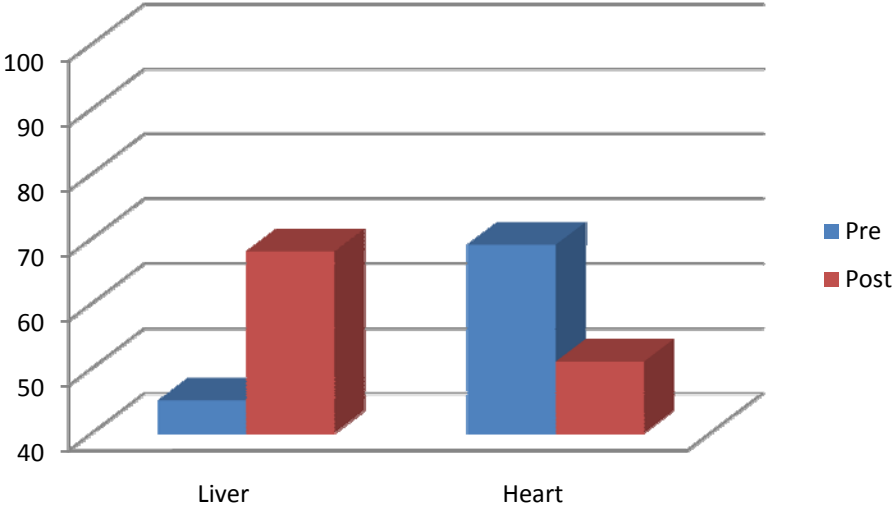


Figure 7. Percentage of correct answers for question 6 by Y3 pupils at all experimental schools pre and post Life Education session.

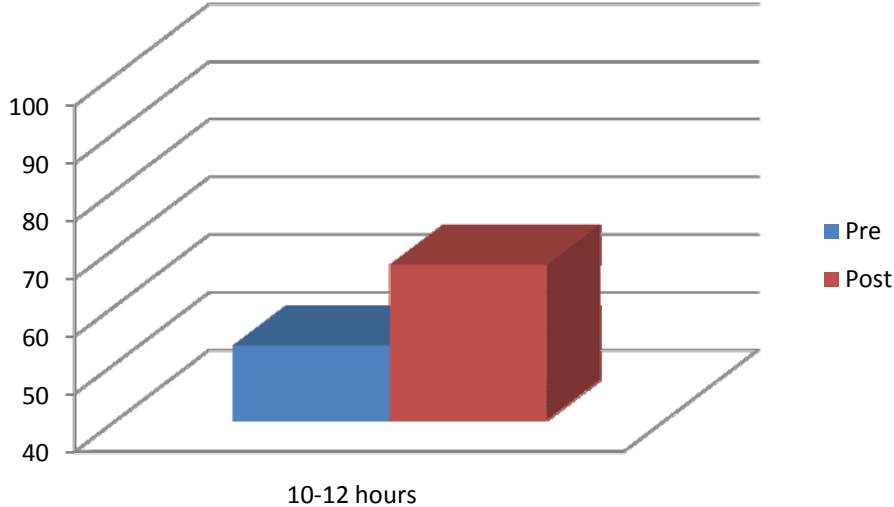


Figure 8. Percentage of correct answers for question 7 by Y3 pupils at all experimental schools pre and post Life Education session.

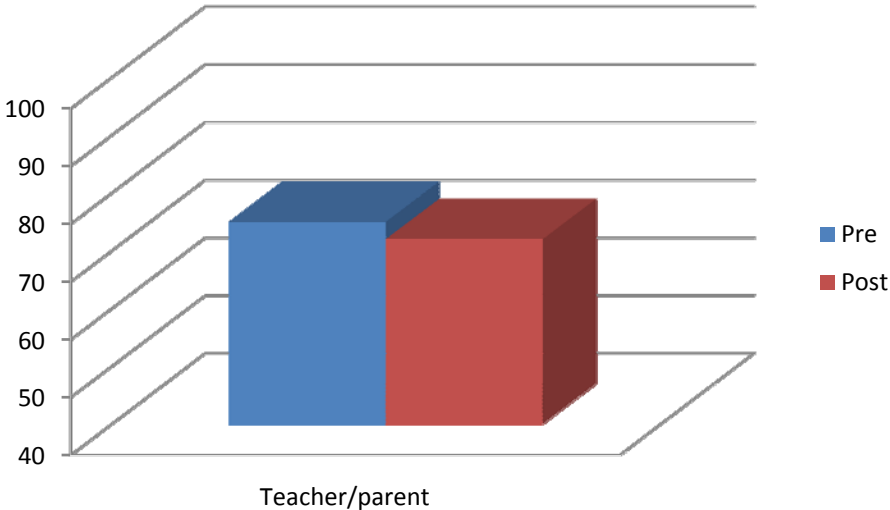


Figure 9. Percentage of correct answers for question 8 by Y3 pupils at all experimental schools pre and post Life Education session.

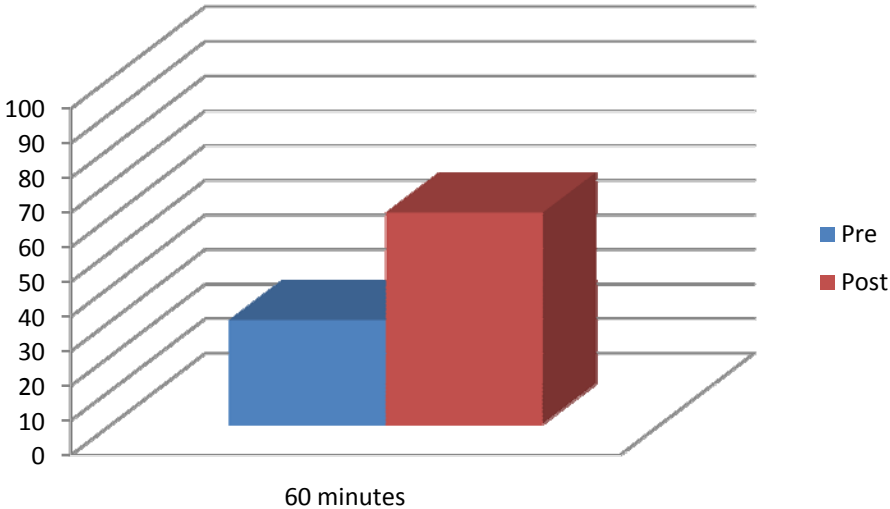
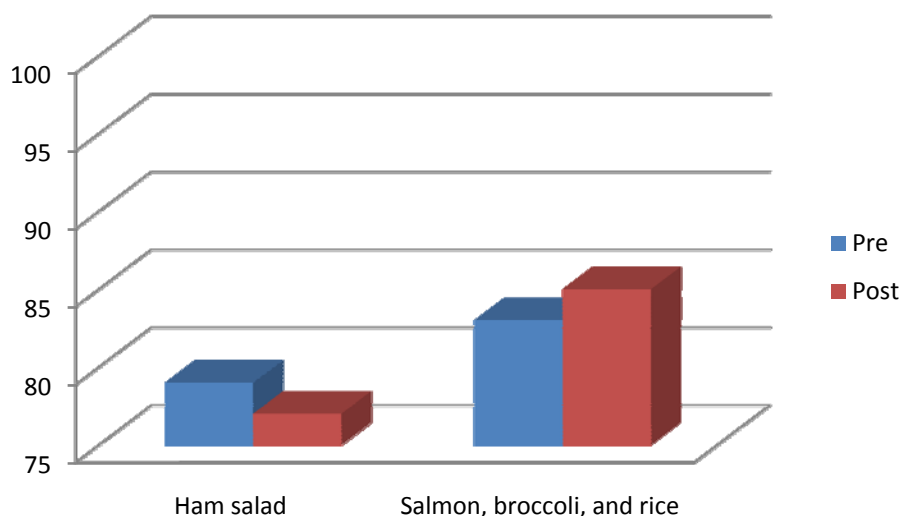


Figure 10. Percentage of correct answers for question 9 by Y3 pupils at all experimental schools pre and post Life Education session.



Year 3 differences within schools

Paired samples t-tests were run individually on each of the four experimental schools used in the sampling of Year 3 pupils. This enables further examination of the differences shown above, to highlight where the significant statistical differences occur ($p < .05$)^{*}. The differences between pre and post intervention scores within each school are described below, and tabulated in table A (annex).

- School A reported significant differences ($p < .05$) on the following questions: Question 1, Question 3, Question 4, Question 5 (Liver), Question 5 (Heart), Question 6, Question 8.
- School B reported significant differences ($p < .05$) on the following questions: Question 1, Question 5 (Liver), Question 5 (Heart), Question 8, Question 9 (Salmon).
- School C reported significant differences ($p < .05$) on the following questions: Question 5 (Liver), Question 6, Question 8.
- School D reported significant differences ($p < .05$) on the following question: Question 5 (Liver).

3.2 Year 5

Data were analysed to show the percentages of correct answers for each question before the Life Education session and afterward. Table 2 shows the results of all pupils sampled from Y3 from the four experimental schools. Figure 11-20 also shows the percentage of correct responses pre and post LEC session by year 5 pupils at the four experimental schools. Paired samples t-tests were used to determine differences between the answers of each question before and after the Life Education session. Figure 21 shows the distribution of pupil's knowledge prior to the LEC session and their knowledge after the session. To calculate the distribution each correct answer was given a score of one, and each incorrect

^{*} A measure of probability that a difference between groups during an experiment happened by chance. The lower the p -value, the more likely it is that the difference between groups was caused by intervention.

answer was given -1. This analysis was done on the seven answers which significantly differed between knowledge before the LEC session and after the session.

Table 2. Percentages of correct answers before and after the LEC session in all Y5 pupils.
(Statistically different results shown with further information)

QUESTION		PRE	POST
1) What are the five things that everyone needs to stay alive?			
	Oxygen	99%	97%
	Drink	98%	98%
	Sleep	96%	98%
	Food	100%	98%
	Exercise	93%	94%
2) How many fruit and vegetable portions should people eat every day?			
	Five	97%	96%
3) How many glasses of drink should a person have every day?			
	6-10	63%	78%
		$t(136) = 3.534, p = .001$	
4) What causes the lungs of smokers to turn black?			
	Tar	77%	94%
		$t(136) = 5.258, p = .000$	
5) What happens when people drink alcohol?			
	They do dangerous things	93%	94%
	They get into fights	87%	86%
	They forget things	82%	88%
		$t(136) = 2.550, p = .012$	
	They get sick	81%	87%
		$t(136) = 2.917, p = .004$	
6) What parts of the body are most affected by drinking too much alcohol?			
	Liver	71%	79%
		$t(136) = 2.149, p = .033$	
	Heart	63%	71%
		$t(136) = 2.108, p = .037$	
7) When are medicines dangerous?			
	If you overdose	88%	90%
	If taken when not needed	94%	87%
	If you take an adult's medicine	87%	81%
8) How many hours sleep should you have every night?			
	10-12 hours	71%	81%
		$t(136) = 2.382, p = .019$	
9) How much exercise should you do every day?			
	60 minutes	63%	90%
		$t(136) = 6.312, p = .000$	
10) What is the best way of saying "No"?			
	To be assertive	55%	78%
		$t(136) = 6.159, p = .000$	

Figure 11. Percentage of correct answers for Question 1 by Y5 pupils at all experimental schools pre and post Life Education session.

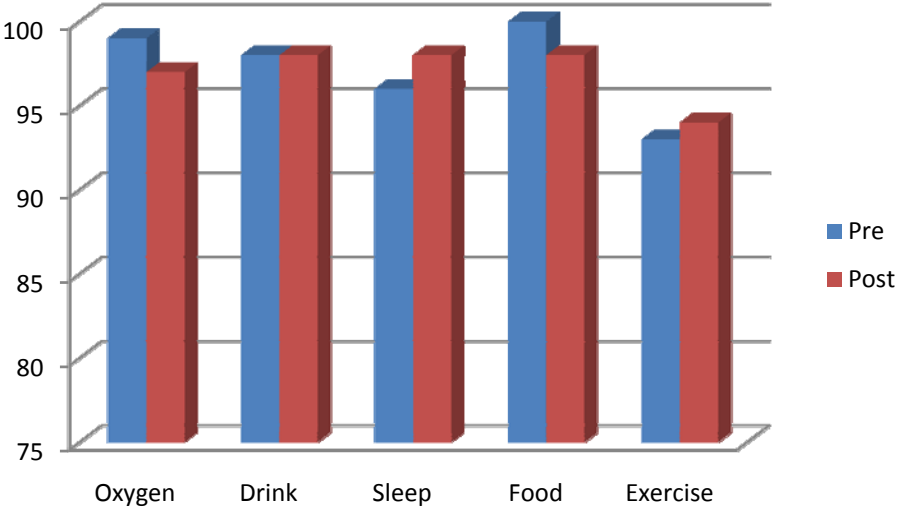


Figure 12. Percentage of correct answers for Question 2 by Y5 pupils at all experimental schools pre and post Life Education session.

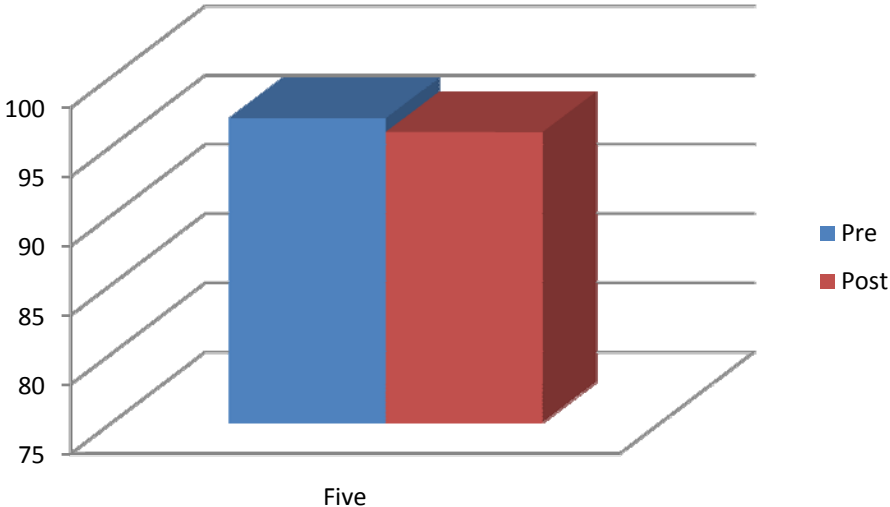


Figure 13. Percentage of correct answers for Question 3 by Y5 pupils at all experimental schools pre and post Life Education session.

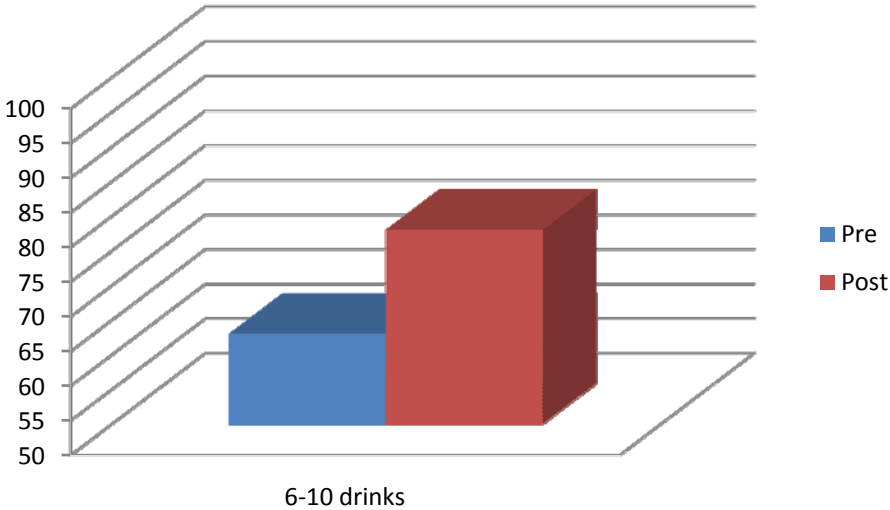


Figure 14. Percentage of correct answers for Question 4 by Y5 pupils at all experimental schools pre and post Life Education session.

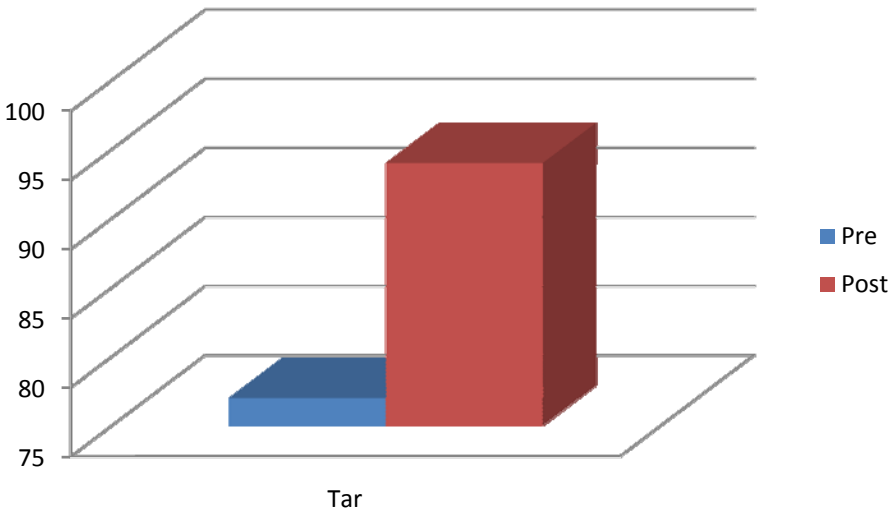


Figure 15. Percentage of correct answers for Question 5 by Y5 pupils at all experimental schools pre and post Life Education session.

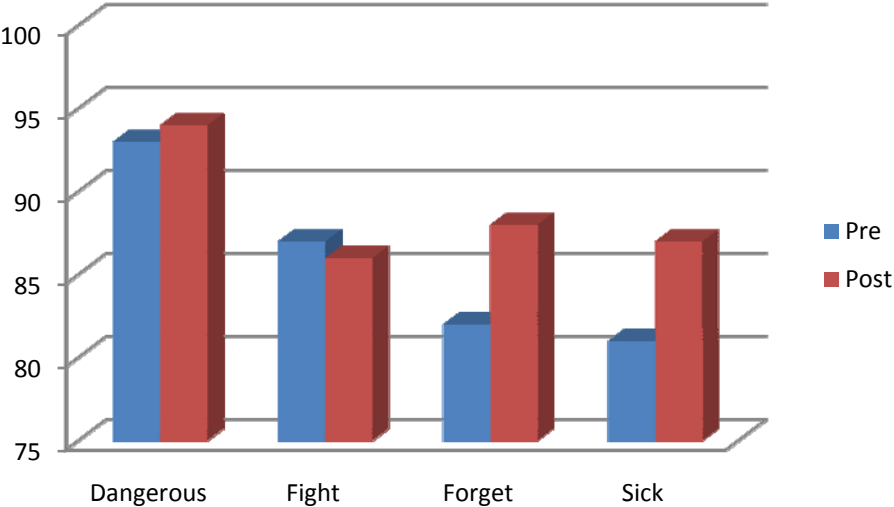


Figure 16. Percentage of correct answers for Question 6 by Y5 pupils at all experimental schools pre and post Life Education session.

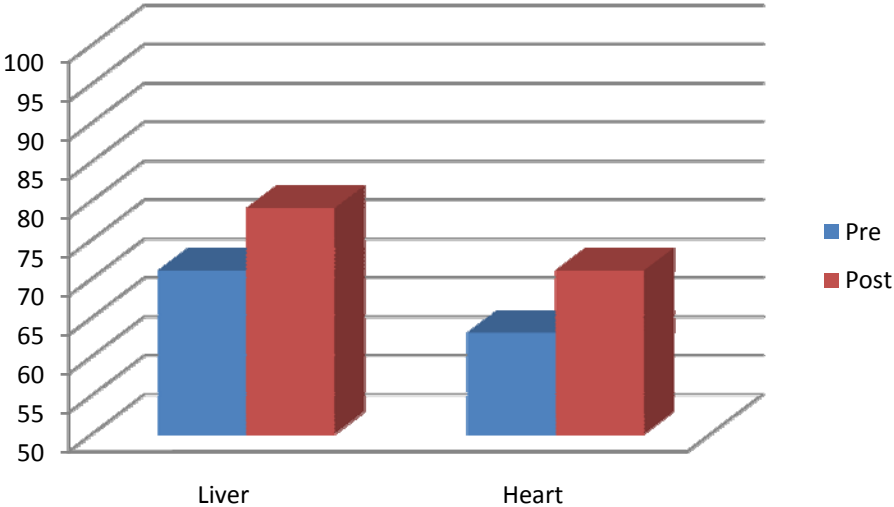


Figure 17. Percentage of correct answers for Question 7 by Y5 pupils at all experimental schools pre and post Life Education session.

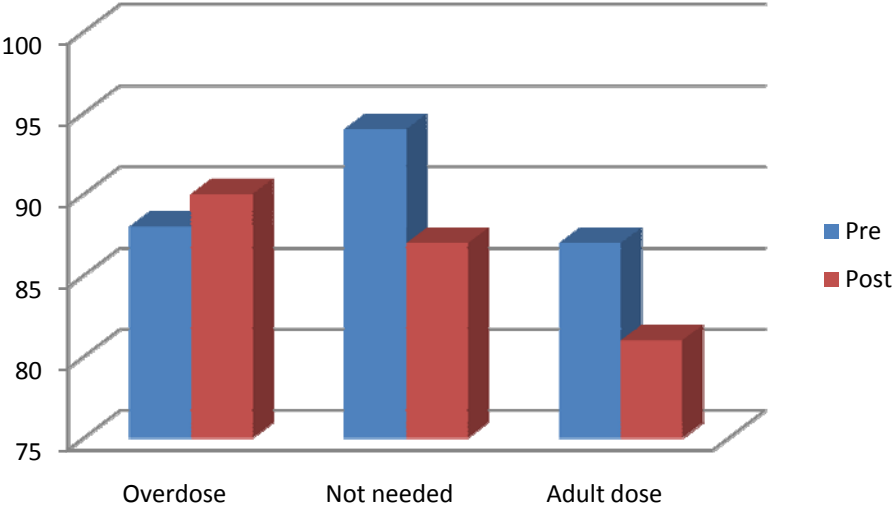


Figure 18. Percentage of correct answers for Question 8 by Y5 pupils at all experimental schools pre and post Life Education session.

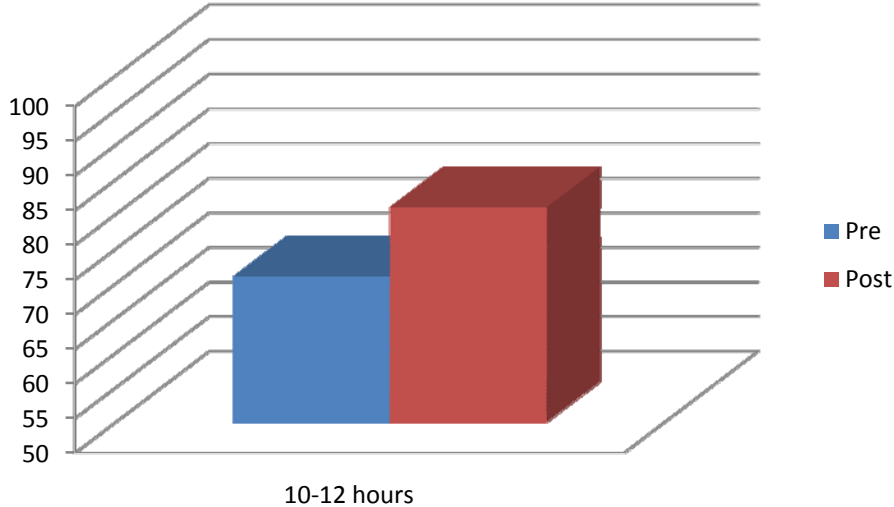


Figure 19. Percentage of correct answers for Question 9 by Y5 pupils at all experimental schools pre and post Life Education session.

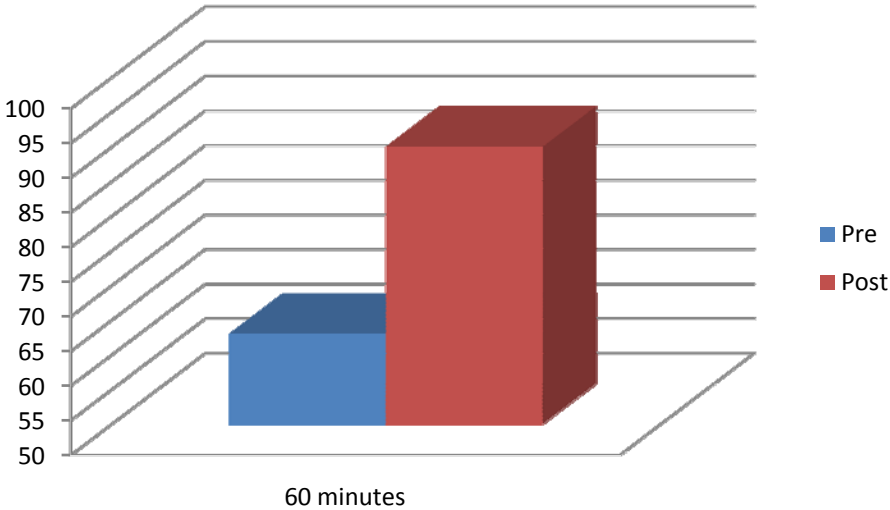


Figure 20. Percentage of correct answers for Question 10 by Y5 pupils at all experimental schools pre and post Life Education session.

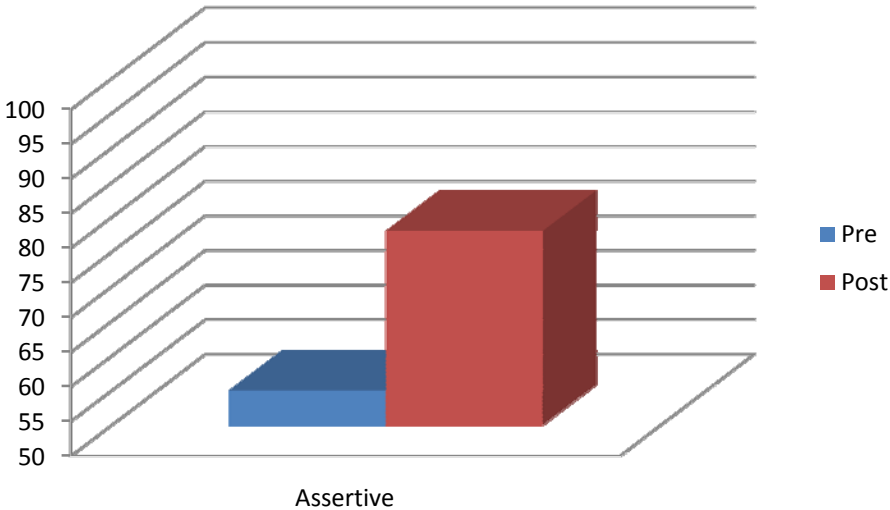
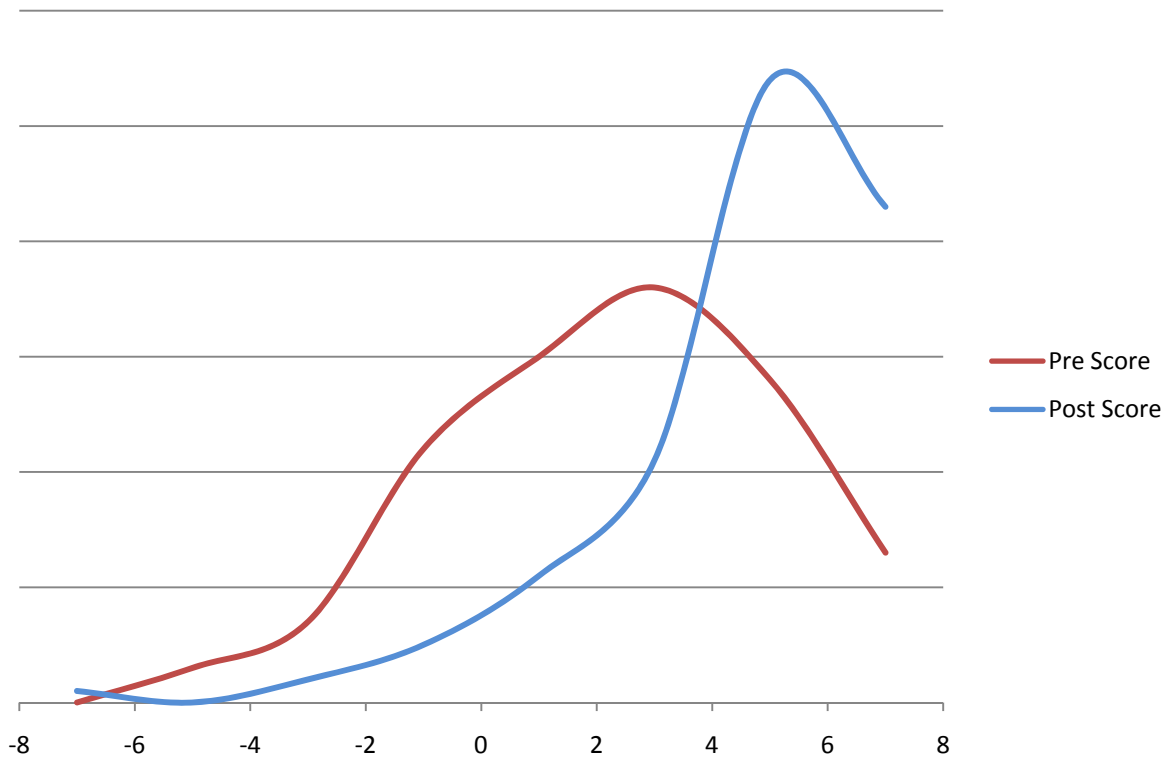


Figure 21. The distribution scores of pupil's knowledge for the pre and post LEC sessions.



Year 5 differences within schools

Paired samples t-tests were ran individually on each of the four experimental schools used in the sampling of Year 5 pupils. This enabled further examination of the differences shown above, insomuch that it highlights where the statistically significant differences ($p < .05$) occur. The following differences are between pre and post intervention scores within each school (please see Table B in annex for further statistical information).

- School A reported significant differences ($p < .05$) on the following questions: Question 3, Question 5, Question 6 (Heart), Question 8, Question 9, Question 10.
- School B reported significant differences ($p < .05$) on the following questions: Question 5, Question 9, Question 10.
- School C reported significant differences ($p < .05$) on the following questions: Question 3, Question 4, Question 8, Question 9, Question 10.
- School D reported significant differences ($p < .05$) on the following questions: Question 4, Question 6 (Liver), Question 9, Question 10.

3.3 Comparisons between Year 3 and Year 5

There were some similarities with the test forms given to the Year 3 pupils and the Year 5 pupils which enable some comparison between the groups. The following questions were included in both tests:

- What are the five things that everyone needs to stay alive?
- How many fruit and vegetable portions should people eat every day?
- What happens when people drink alcohol?

- What parts of the body are most affected by drinking too much alcohol?
- How many hours sleep should you have every night?
- How much exercise should you do every day?

Differences between Y3 and Y5
Y3 pre Vs Y5 pre

Independent samples t-tests were conducted to compare year 3 pupils knowledge before the intervention (Table 1) and year 5 pupils (Table 2) knowledge before the intervention. Greater statistical detail is provided in the Annex. The following questions revealed statistically significant results ($p < .05$):

- What are the five things that everyone needs to stay alive?
Year 5 pupils had statistically significant greater baseline knowledge for the answers of Oxygen, Exercise, and Sleep.

- How many fruit and vegetable portions should people eat every day?
A statistically larger proportion of Year 5 pupils knew the correct answer was five.

- What parts of the body are most affected by drinking too much alcohol?
There were a statistically greater proportion of Year 5 pupils than Year 3 pupils who knew the liver was affected by drinking too much alcohol.

- How many hours sleep should you have every night?
A statistically higher percentage of Year 5 pupils than Year 3 pupils answered this question correctly.

- How much exercise should you do every day?
A significantly higher proportion of Year 5 pupils knew that they should do 60 minutes of exercise daily.

Y3 post Vs Y5 post

Independent samples t-tests were also conducted to compare year 3 pupils knowledge after the intervention and year 5 pupils knowledge after the intervention. The following questions revealed statistically significant results ($p < .05$):

- What are the five things that everyone needs to stay alive?
A statistically higher percentage of Y5 pupils after the LEC session knew the correct answers were exercise and sleep.

- How many fruit and vegetable portions should people eat every day?
It was again Year 5 pupils who had the significantly higher proportion of pupils knowing the answer was five.

- What happens when people drink alcohol?
Statistically more Year 5 pupils than Year 3 pupils knew one of the correct answers for this question was people become forgetful when drinking alcohol.

- What parts of the body are most affected by drinking too much alcohol?
A statistically greater proportion of Year 5 pupils knew the heart and liver were affected by drinking too much alcohol.

- How many hours sleep should you have every night?

A significantly higher percentage of Year 5 pupils, compared to Year 3 pupils, correctly identified after the LEC session that 10-12 hours is the amount of sleep they should be having every night.

- How much exercise should you do every day?

A statistically larger proportion of Year 5 pupils knew the correct answer compared to Year 3 pupils following the LEC session.

Y3 post Vs Y5 pre

Independent samples t-tests were conducted to compare year 3 pupils knowledge after the intervention and year 5 pupils knowledge before the intervention. Statistically significant results would demonstrate poor knowledge retention from previous session of LEC. All questions where there was not a significant result would demonstrate good knowledge retention or learning in-between LEC sessions. The following questions revealed significant differences ($p < .05$):

- What are the five things that everyone needs to stay alive?

A statistically larger proportion of Year 5 pupils before the LEC session knew that food and exercise were a basic requisite of life compared to Year 3 pupils after the LEC session.

- How many fruit and vegetable portions should people eat every day?

A significantly higher percentage of Y5 pupils before the session than Y3 pupils after the session knew that five fruit and vegetables should be eaten every day.

3.4 Control School

Y3 data

Control school and experimental school data were analysed using independent samples t-tests. The control school data was analysed against both year 3 pre and post Life Education teaching session data. When comparing the pre LEC session scores of the control school and the experimental school, it was found that only one question revealed a significant difference. Question 8 showed that the control school had greater baseline knowledge when it came to awareness of the amount of exercise the pupils should be completing daily. There were four significant differences when comparing the control school and the experimental schools following the LEC session. The experimental schools had a significantly higher proportion of correct answers for questions 1 and 5 (liver). The control school had a significantly higher proportion of correct answers for questions 5 (heart) and question 8. Table C (Please see Annex) shows the further statistical information on the differences found between control school data against pre data and post data. Negative t values show that the control school had a higher percentage of students knowing the correct answer for that question. Significant results with positive t values mean that a higher proportion of pupils from the experimental school knew the correct answer.

Y5 data

Control school and experimental school data were analysed using independent samples t-tests. The control school data was analysed against both year 5 pre and post Life Education teaching session data. When comparing the pre LEC session scores of the control school and the experimental school, it was found that three question revealed a significant difference. Question 5 (dangerous), question 8, and question 10 showed that the control school had greater baseline knowledge. There were six significant differences when

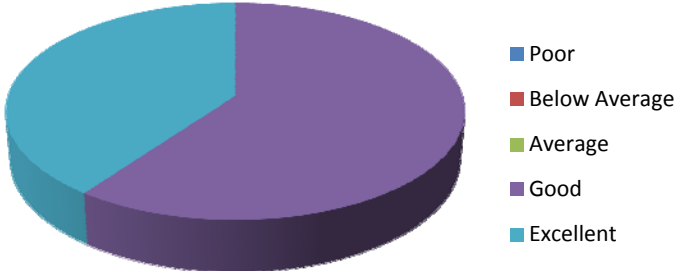
comparing the control school and the experimental schools following the LEC session. The experimental schools had a significantly higher proportion of correct answers for questions 3, 4 and 10. The control school had a significantly higher proportion of correct answers for questions 5 (dangerous), question 6 (liver) and question 6 (heart). Table C (Please see annex) shows the significant differences found between control school data against pre data and post data. Negative *t* values show that the control school had a higher percentage of students knowing the correct answer for that question. Significant results with positive *t* values mean that a higher proportion of pupils from the experimental school knew the correct answer.

Teachers Feedback

The results for the semi-structured interviews with teachers are presented below. Answers from the teacher’s responses are presented in figures 22-29 which show the proportion of responses for each question asked. The teachers rated their response on a 5 point scale anchored with ‘Poor’ through to ‘Excellent’.

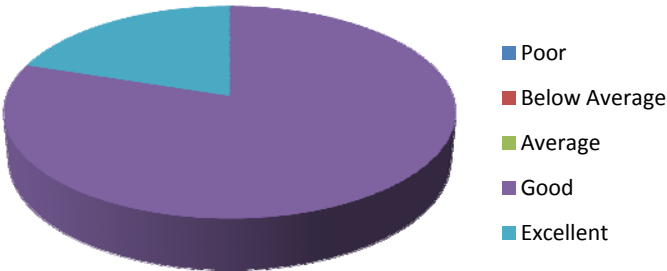
Sixty percent of the teachers thought the LEC educators teaching style was good with 40% thinking it was excellent (Figure 22).

Figure 22. What teachers thought about LEC educator’s teaching style



A majority of the teachers felt the pupils achieved a good level of understanding. The responses show that a smaller amount felt the pupils had excellent understanding (Figure 23).

Figure 23. What teachers thought of the children’s understanding of concepts.



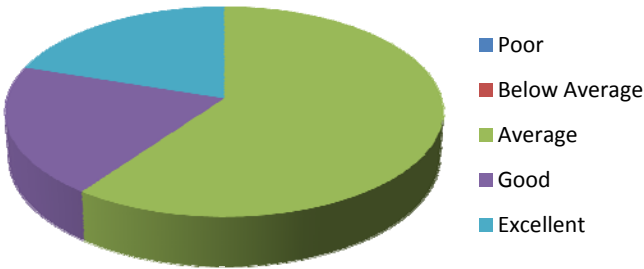
All the teachers indicated that the LEC programme was at least good in terms of suitability to the pupils needs/interests. The responses show that 60% of the teachers rated the suitability as good and 40% rated it as excellent (Figure 24).

Figure 24. What teachers thought of the suitability to the needs/interests of children.



Figure 25 shows the teachers responses when questioned how they rated the programmes impact on the children. The question provided the largest proportion of 'Average' responses, which was the lowest response given to any of the questions. The responses show that 60% of the teachers thought the LEC's impact on the children was average,

Figure 25. What teachers thought of programme's impact on children.



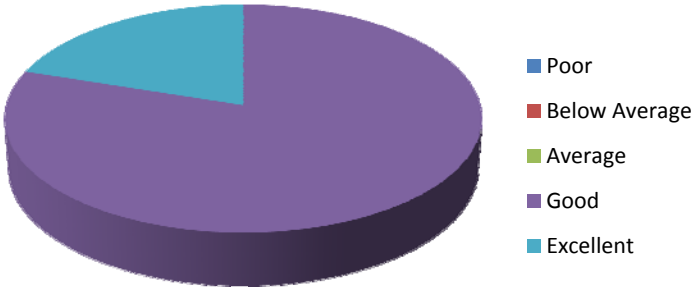
The teachers thought the LEC programme had a good to excellent impact on the school. Eighty percent of the teachers thought the impact was good (Figure 26).

Figure 26. What teachers thought of the programme's impact on the school.



The content of the LEC programme was rated as at least good by the teachers. The responses shown in Figure 27 show that 80% of the teacher rated the programme as good, and 20% rated as excellent.

Figure 27. What teachers thought of the programme content.



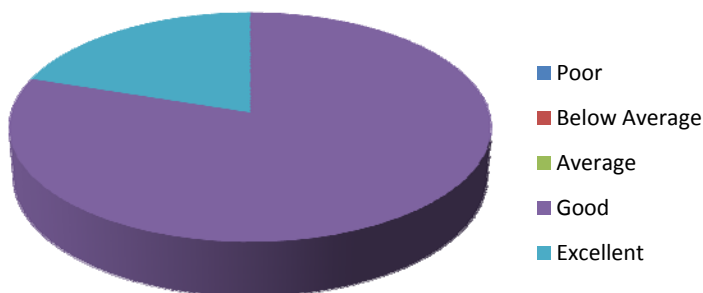
There was some difference in opinion from the teachers when asked about the presentation of the work in the LEC. Forty percent of the teachers rated the presentation as average, however 40% also rated it as excellent (Figure 28).

Figure 28. What teachers thought of the programme presentation.



The final question asked the teacher for an overall rating of the LEC programme; all the teachers rated it as at least good. Twenty percent rated it as excellent with the remaining 80% rating it as good (Figure 29).

Figure 29. Teachers overall evaluation of the programme.

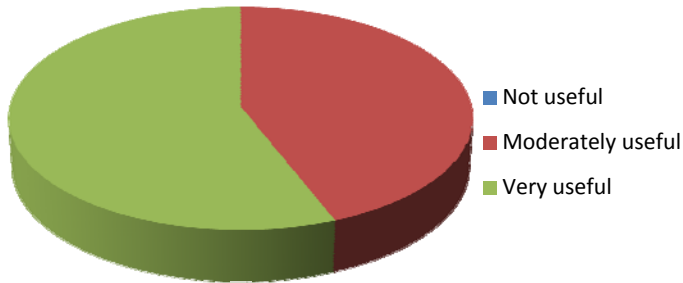


Parents Feedback

The feedback collected from the parents immediately after a LEC workshop is presented in figures 30-36 representing the seven topics covered by the LEC. The questions asked how useful the parent felt each topic covered in the workshop was. The options for response were either: not useful, moderately useful, or very useful.

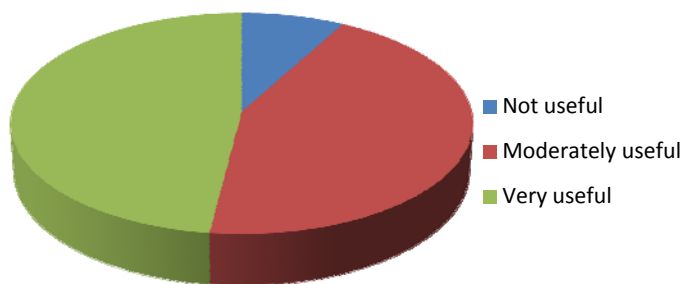
Over half of the parents (56%) thought the topic of acting as a role model for their child was very useful (Figure 30). The remaining 44% thought the information given was moderately useful.

Figure 30. What parents thought about the 'acting as a role model for your child' work.



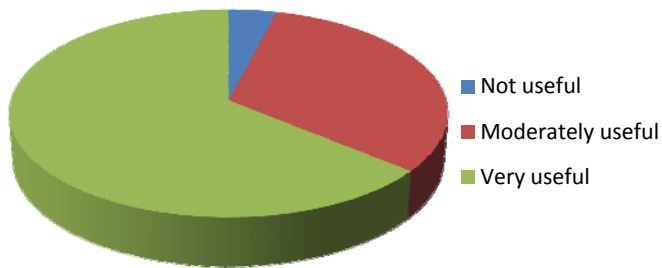
The topic of how to protect their child from taking risks received a mixed response. A small minority (8%) did not find the information useful, but 48% found the information very useful (Figure 31).

Figure 31. What parents thought about the 'how to protect your child from taking risks' work.



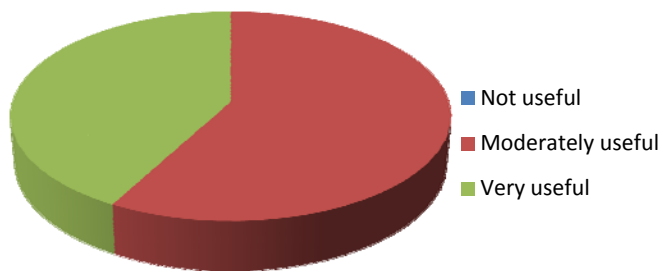
The majority of parents thought the information given on drugs was very useful (64%), but there was a small minority who did not find the information useful (4%). Figure 32 shows this information along with the proportion of parents who found the drug information moderately useful (32%).

Figure 32. What parents thought of the 'drug information' work.



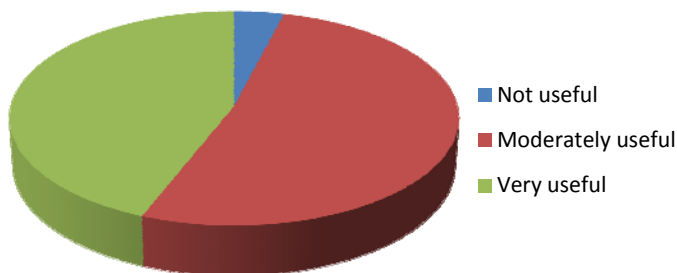
Parents responses when asked how useful they found the LEC advice given about asking their children open questions are shown in Figure 33. It can be seen that all parents found this of some use, with 42% finding it very useful.

Figure 33. What parents thought of the 'open questions' work.



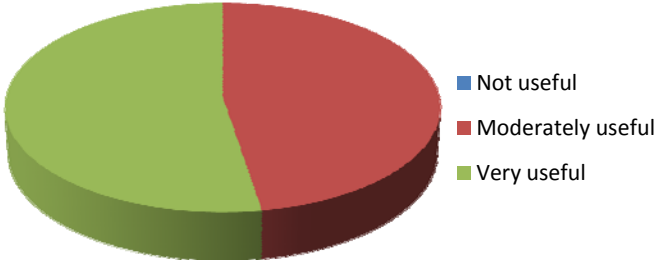
Over half of the parents found the information given on assertive behaviour moderately useful (52%). A small minority did not find the information useful (4%), but overall this topic was thought of as useful (Figure 34).

Figure 34. What parents thought of the 'assertive behaviour' work.



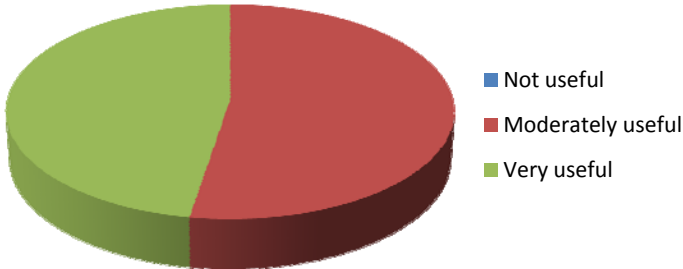
The parents found the information and advice given on active listening at least moderately useful. The responses in Figure 35 show that 53% thought the information was very useful, with the remaining amount finding the information moderately useful.

Figure 35. What parents thought about the 'active listening' work.



Parents thoughts on the information given on the topic of giving praise to their children can be seen in Figure 36. It can be seen that this information was at least useful, with 53% finding the information very useful.

Figure 36. What parents thought of the 'praise' work.



4. Discussion

The project aimed to measure the impact of the Life Education Centre (LEC) in schools throughout Wirral. Information was gathered through testing Year 3 and Year 5 school pupils attending primary schools in Wirral before and after they attended LEC on their mobile bus. The results of Year 3 and Year 5 pupils were presented separately as a different test was used to assess the impact of the LEC.

4.1 Year 3

Year 3 results showed significant differences between pre and post LEC sessions in five questions. Data on question 1, asking the colour of smokers lungs, showed a significant increase in pupils' knowledge following the Life Education session ($p < .05$). This result clearly shows the work completed in the session improved the pupils' knowledge of the effects of smoking. Question 5 asked which parts of the body were most affected by drinking alcohol. The results showed an interesting change in answers between pre and post intervention, but it is likely this is due to poor comprehension of the questions. The pupils were asked to tick two answers for the question, however it appears many pupils did not do this. Before the LEC session more than two-thirds of pupils correctly thought the heart was affected by drinking too much alcohol, with less than half correctly identifying the liver. After the LEC session, just over half of the pupils correctly thought the heart was affected (a reduction of 17%) and more than two-thirds correctly identified the liver (an increase of 23%). Despite the apparent issue with comprehension the results clearly show a statistically significant improvement in the percentage of pupils correctly identifying the liver as a part of the body affected by drinking alcohol ($p < .05$). Question 6 asked the pupils about how much sleep they should be having every night. The results showed that, following the Life Education session, significantly more pupils correctly thought they should have 10-12 hours sleep every night ($p < .05$). The final area where Year 3 pupils showed significant improvement in knowledge was regarding how much exercise they should be doing every day ($p < .05$). Following the LEC session, 61% of the pupils knew they should complete 60 minutes of exercise every day, compared to 30% correctly knowing before the session. Overall the areas that did not show significant levels of improvement were around how much fruit and vegetables they should have, the five essential things needed to stay alive, the social effects of alcohol, what to do if another child 'nags' them, and identifying the healthiest food options.

Upon further examination of Year 3 results, it can be seen (please see annex: table A) that differences before and after the LEC session were more noticeable at some schools than others. The most differences were noticed at School A where significant differences were evident in seven questions. Interestingly, School A is located in the area of lowest deprivation which would initially suggest education levels would be high and therefore the LEC sessions would not have such a large impact. However, it is also noted that School A has a higher than average level of pupils with a statement of special educational need. School D, the school in the highest area of deprivation, showed the least impact as a result of the LEC session. Differences found between schools could be, in part, a result of the individual choice the schools have over the content of the LEC sessions. As the school itself can select the topics covered by the LEC some schools may select work that reinforces that has already been completed in schools. Conversely, other schools may use the LEC as an opportunity to raise new topics not previously covered by the school in depth. Pupils from all the schools showed significant improvements in knowledge of the physiological effects of drinking alcohol; demonstrating that the LEC effectively delivered this topic which the schools did not previously cover sufficiently.

4.2 Year 5

The results from Year 5 data showed a greater number of knowledge improvements compared to Year 3. Data showed significant results on nine responses over seven questions. As with the Year 3 data, there were no significant differences evident in the question asking what the five essential things to maintain life are. This is probably down to the high percentage of correct answers to the question prior to the LEC session. Question three, asking how many drinks should a person have daily, produced a significant result ($p < .05$). This represents an example of a topic that would not normally be covered in school lessons but is useful and practical information for the child. It shows the LEC can cover and effectively deliver topics that would not usually fit in with the curriculum. Question four also produced a significant result which showed the pupils knowledge improved concerning the causes of smokers' lungs turning black ($p < .05$). Following the LEC session, 94% of the pupils knew that tar was the cause of blackening of smokers' lungs which represents an overwhelming majority of pupils. The Year 5 pupils showed some increased understanding of the more social effects of alcohol following the LEC session. A significantly higher proportion of them knew that alcohol leads to forgetfulness ($p < .05$) and illness ($p < .05$). Although there were not significant differences between some of the other correct answers concerned with social effects of alcohol, there were still higher proportions of correct answers both pre and post LEC session. The pupils also showed increased awareness of the physiological effects of alcohol. The results showed a significant increase in the correct answers of liver ($p < .05$), and heart ($p < .05$) following the LEC session. This shows a similarity with Year 3 results and clearly demonstrates an area where the LEC improves the pupil's knowledge. A further similarity with Year 3 results was the increased knowledge around how much sleep to have nightly. Following their time with the LEC the pupils recorded a significant increase in the percentage who knew to have between 10-12 hours sleep per night ($p < .05$). Further evidence of the LEC's consistent teaching was seen in the increased knowledge of how much exercise to complete daily. The year 5 pupils, as with the Year 3 pupils, showed positive significant difference from before to after the LEC session when understanding they should exercise for 60 minutes daily ($p < .05$). The final question of the test also showed a significant improvement in the pupils understanding following the LEC session. A significantly higher number of pupils could correctly answer the best way of 'saying no' was to be assertive ($p < .05$). The histogram presented (figure 21) shows the distributional change in scores for the pupils based on the seven statistically significant questions. The shift in the curve from pre LEC session to post LEC session illustrates that more pupils correctly answered seven of the ten questions after the session.

Individual differences between schools can be seen in Table B (see annex). The results presented show the Year 5 results broken down by the four experimental schools. As was the case with Year 3 results, it is evident that School A accounts for the most significant differences between pre and post LEC session. It is also clear that the questions relating to amount of exercise and assertive behaviour revealed positive significant differences across all schools, suggesting that the LEC is the only place currently providing this information to the pupils effectively.

4.3 Comparison between Year 3 and Year 5 data

The design of the forms used in the project enabled some comparison between year groups. As would be expected Year 5 pupils demonstrated the greater baseline knowledge prior to the LEC sessions taking place. The only area where this was not the case was the pupils understanding of the social impacts of alcohol. As the results of this question were not significantly different between Year 3 and Year 5, it would suggest that this area is not currently adequately covered in schools. Therefore it represents a topic where the LEC offers

the opportunity for the pupils to learn new information not currently taught in schools. It seems the LEC currently teach this area well as both Year 3 and Year 5 pupils improving their knowledge in this area, and significantly so amongst Year 5 pupils.

When comparing the post LEC scores of two year groups it is again Year 5 with the significantly higher proportion of pupils correctly answering the questions. This was the case in every area where comparisons between the two years was possible.

Comparisons between the post LEC scores of the Year 3 pupils and the pre LEC scores of the Year 5 pupils could help to highlight the level of knowledge retention and learning by the pupils' in between LEC sessions. Such comparison revealed significant scores in the areas of essential things to stay alive, and the amount of fruit and vegetables to consume daily. This suggests that in these two areas the pupils knowledge retention from one LEC session to another is poor, or that significant learning has taken place in between. With the case of amount of fruits and vegetables it could be that significant learning has taken place in school given the exceptionally high level of correct answers by Year 5 pupils prior to the LEC session compared with the lower levels of Year 3 knowledge post LEC session.

Comparisons with control school

Year 3

The results from the control school were compared to both the pre and post results from the Year 3 pupils in the experimental schools. Only one significant difference was found between the control school and the pre LEC scores at the experimental schools; relating to the amount of exercise that should be completed daily. This shows that the baseline knowledge of the Year 3 pupils was similar between experimental schools and control school and therefore an appropriate school to enable comparison with. There were three meaningful significant results (see annex: table C) between the experimental schools post LEC session and the control school, clearly showing the immediate benefit of the LEC in schools that hold sessions and those who do not. Specifically the significantly improved areas were concerning effects of smoking, physiological effects of alcohol, and exercise. The largest improvement in knowledge was the amount of exercise needed daily.

Year 5

The results from the control school were compared to both the pre and post results from the Year 5 pupils in the experimental schools. There were three significant differences between the control school and the Year 5 pre LEC scores which suggest that the pupils at the control school were slightly more advanced than their experimental school counterparts. This was particularly evident when it can to assertive behaviour. Following the LEC session the pupils at the experimental schools did make some improvements compared to the control school baseline, but there were still some areas where the control school out-performed the experimental schools. The large difference between the control school and the experimental schools on the assertive behaviour question was removed, so the LEC sessions clearly helped to bridge the knowledge gap between the two sets of pupils. There was also a large significant difference in the awareness of how much exercise to complete daily following the LEC session; with a higher proportion of pupils who attended the LEC knowing the correct answer. This result echoed a similar finding in the Year 3 results and clearly shows an area where the LEC is directly benefitting the pupils.

4.4 Teachers

Although the amount of teachers surveyed was low ($n = 5$) the response to the LEC programme was overwhelmingly positive. None of the responses to the questions were rated lower than average and, as figures 22-29 show, the majority of responses rated the LEC as good. The highest proportion of 'Excellent' responses was in relation to the educator's teaching style and the suitability to the pupil's needs/interests. The excellent scores for suitability may, in part, reflect the fact that each school can select the topics the LEC works on with the pupils. This shows a good level of flexibility by the LEC and ensures specificity for each school. Eighty percent of the teachers felt the LEC programme complemented their curriculum and approach in the classroom very well. The main thoughts behind this was the flexibility afforded by the LEC and reinforcement of topics already covered in school. The teachers felt the impact on individual pupils was difficult to measure but generally the programme had a positive impact. One teacher noted that the LEC "Wows the children" and another commented that it presents work in a different context. The LEC setting allowed the pupils to talk about topics not always covered in school and gave them a forum for discussion that was not directly with their teacher. The teachers felt the impact of the LEC programme was largely a result of the visual stimulus available in the bus, along with the role play activities.

All of the teachers were keen to bring their pupils to the LEC yearly and many have taken classes there for several years. Some of the teachers commented that the LEC programme was incorporated into their curriculum and some teaching is built around it. The teachers were also keen to convey how much the children enjoyed the LEC programme and often looked forward to it.

There were some suggestions on how to further improve the LEC programme. A suggestion was that the LEC be used as an opportunity to enhance the pupil's scientific knowledge at Y5/6. As the national curriculum ensures the pupils are at a certain level it would be advantageous for the pupils to progress beyond this and further develop their understanding. Also, the LEC could be responsive to recent or current trends and events. The suggestion was made that the LEC represents a good opportunity to be responsive in a way the curriculum does not allow. The example given was in relation to cyber bullying and enhancing the pupil's awareness of the issue and how to best deal with the problem.

4.5 Parents

A total of 25 parents completed the questionnaire and responses were positive to the LEC programme. Figures 30-36 show the proportion of responses, and it can be seen that the parents found the information on drugs particularly useful. Two more topics with a high proportion of parents finding it very useful were 'acting as a role model for their child', and skills around 'active listening'.

4.6 Comparisons to other work

Previous evaluation by the LEC on the impact of their programme in Wirral found positive results from the pupils, teachers, and parents. There were many encouraging similarities between the previous evaluation and the present work. Specifically, a high proportion of pupils in the previous evaluation rated the LEC as good which was supported anecdotally by teachers in the present work. Further, the teachers rated the LEC educator's style as at least good, the suitability to the pupils needs/interest as at least good and both questions had a substantial portion of excellent responses.

The Tellus3 survey results for Wirral offer some further insight into the behaviour of school pupils. As the youngest participants are Year 6 pupils it would only be appropriate to draw comparison with the Year 5 pupils used in this project. A startling result from the Tellus3 data shows that a significantly higher percentage of pupils in Wirral are eating less than five fruit and vegetables per day compared to their peers throughout the country. When used in conjunction with the Year 5 results for fruit and vegetable consumption in this study, it can be seen that the pupils are aware of how many they should be eating but in are not actually eating that amount. Therefore this represents an area where the LEC could work with parents to improve this statistic. The '5-a-day' message appears to be sufficiently reaching the children but the lack of children actually attaining this standard presents a sizeable challenge which could be taken up by the Wirral LEC.

A further significant finding from Tellus3 for Wirral shows the significantly higher than national percentage of young people who have been drunk. The social and biological effects of drinking are currently covered in the LEC session, and the results for Year 5 pupils show a statistically significant improvement in knowledge after the session (Table 2). If this appropriate work continues in Wirral there will be hopefully be some progress away from the high levels of young people experiencing drunkenness.

4.7 Conclusions

The aim of assessing the impact of the Life Education Centre in Wirral schools was successfully conducted through consulting pupils, teachers, and parents. All three groups responded positively when tested or asked about the impact of the centre. Both Year 3 and Year 5 pupils showed improved knowledge immediately after the taught sessions. Clearly the impact of the LEC differs between schools but there is still an overall positive improvement in the pupil's knowledge. The flexibility offered by the LEC which allows the individual schools to select the topics covered allows for the schools to use the LEC in a way to suit their needs. The teachers felt the pupils enjoyed the LEC and gave them a different context in which to learn. Parents also found the LEC workshop that accompanied their child's session provided useful information, and it also gave them an opportunity to participate in a school process with their child.

It appears the Wirral Life Education Centre provides the pupils with an enjoyable and different learning experience. An experience in which they show a capability to learn due to the effective teaching style employed in the centre. These findings suggest Wirral Life Education Centre can contribute towards government initiatives for 21st Century Schools, providing an opportunity for school pupils to increase their knowledge on important health issues, which potentially could be translated into real life improvements in health and wellbeing of this population.

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Appendix



LIFE EDUCATION CENTRE

School _____ Date today _____

Are you a: Boy? Girl? What year are you at school?: Year _____

How old are you? _____ years _____ months

ABOUT THE CENTRE

Have you ever been to the Life Education centre before?

Never Once A few times Lots of times

If so, when was the last time? Year _____

ABOUT HEALTH

1) What colour are peoples lungs when they smoke cigarettes? (Tick 1)

Green Red Yellow White Black

2) How many fruit and vegetable portions should people eat every day? (Tick 1)

1 2 3 4 5 6 7

3) What are five things that everyone needs to stay alive? (Tick 5)

Air TV Clothes Food

Drink Money Exercise A computer

Sleep School Mobile phone Music

4) What happens when people drink alcohol? (Tick as many as you like)

Nothing	<input type="checkbox"/>	They do dangerous things	<input type="checkbox"/>	They get tummy ache	<input type="checkbox"/>	They forget things	<input type="checkbox"/>
They look funny	<input type="checkbox"/>	They get clever	<input type="checkbox"/>	They are happy	<input type="checkbox"/>	They get very friendly	<input type="checkbox"/>

5) What parts of the body is most affected by drinking too much alcohol? (Tick 2)

Lungs	<input type="checkbox"/>	Heart	<input type="checkbox"/>	Feet	<input type="checkbox"/>	Liver	<input type="checkbox"/>	Eyes	<input type="checkbox"/>
-------	--------------------------	-------	--------------------------	------	--------------------------	-------	--------------------------	------	--------------------------

6) How many hours sleep should you have every night? (Tick 1)

1 -2 hours	<input type="checkbox"/>	6-8 hours	<input type="checkbox"/>	10 - 12 hours	<input type="checkbox"/>	18-20 hours	<input type="checkbox"/>
------------	--------------------------	-----------	--------------------------	---------------	--------------------------	-------------	--------------------------

7) What should you do if another child nags you?

Fight them	<input type="checkbox"/>	Avoid them	<input type="checkbox"/>
Speak to a teacher or parent	<input type="checkbox"/>	Do something else (write):	_____

8) How much exercise should you do every day? (Tick 1)

10 minutes	<input type="checkbox"/>	30 minutes	<input type="checkbox"/>	60 minutes	<input type="checkbox"/>	2 Hours	<input type="checkbox"/>
------------	--------------------------	------------	--------------------------	------------	--------------------------	---------	--------------------------

9) What dinners are best for your body? (Tick 2)

Fried chicken	<input type="checkbox"/>	Ham Salad	<input type="checkbox"/>	Beef burger & chips	<input type="checkbox"/>
Fish & Chips	<input type="checkbox"/>	Salmon & Broccoli & Rice	<input type="checkbox"/>		

10) How do children get overweight/fat? Write what you think:



LIFE EDUCATION CENTRE



School _____ Date today _____

Are you a: Boy? Girl? What year are you at school?: Year _____

How old are you? _____ years _____ months

ABOUT THE CENTRE

Have you ever been in the Life Education Centre before?

Yes No Not Sure

If Yes, what year were you in? Year _____

ABOUT HEALTH

1) What are five things that everyone needs to stay alive? (Tick 5)

Oxygen	<input type="checkbox"/>	TV	<input type="checkbox"/>	Clothes	<input type="checkbox"/>	Food	<input type="checkbox"/>
Drink	<input type="checkbox"/>	Money	<input type="checkbox"/>	Exercise	<input type="checkbox"/>	A computer	<input type="checkbox"/>
Sleep	<input type="checkbox"/>	School	<input type="checkbox"/>	Mobile phone	<input type="checkbox"/>	Music	<input type="checkbox"/>

2) How many fruit and vegetable portions should people eat every day? (Tick 1)

1 2 3 4 5 6 7

3) How many glasses of drink should a person have every day? (Tick 1)

1-5 6-10 11-15 16-20

4) What causes the lungs of smokers to turn black? (Tick 1)

Treacle Tar Dust Coal Ash

5) What happens when people drink alcohol? (Tick as many as you like)

Nothing	<input type="checkbox"/>	They do dangerous things	<input type="checkbox"/>	They get into fights	<input type="checkbox"/>	They forget things	<input type="checkbox"/>
They look funny	<input type="checkbox"/>	They get are sick	<input type="checkbox"/>	They are happy	<input type="checkbox"/>	They get very friendly	<input type="checkbox"/>

6) What parts of the body are most affected by drinking too much alcohol? (Tick 2)

Lungs	<input type="checkbox"/>	Heart	<input type="checkbox"/>	Feet	<input type="checkbox"/>	Liver	<input type="checkbox"/>	Eyes	<input type="checkbox"/>
-------	--------------------------	-------	--------------------------	------	--------------------------	-------	--------------------------	------	--------------------------

7) When are medicines dangerous? (Tick as many as you like)

If you overdose	<input type="checkbox"/>	If taken with water	<input type="checkbox"/>	If injected	<input type="checkbox"/>
If swallowed	<input type="checkbox"/>	If taken when not needed	<input type="checkbox"/>	If you take an adult's medicine	<input type="checkbox"/>

8) How many hours sleep should you have every night? (Tick 1)

1 -2 hours	<input type="checkbox"/>	6-8 hours	<input type="checkbox"/>	10 - 12 hours	<input type="checkbox"/>	18-20 hours	<input type="checkbox"/>
------------	--------------------------	-----------	--------------------------	---------------	--------------------------	-------------	--------------------------

9) How much exercise should you do every day? (Tick 1)

10 minutes	<input type="checkbox"/>	30 minutes	<input type="checkbox"/>	60 minutes	<input type="checkbox"/>	2 Hours	<input type="checkbox"/>
------------	--------------------------	------------	--------------------------	------------	--------------------------	---------	--------------------------

10) What is the best way of saying "No" (Tick 1)

To be aggressive	<input type="checkbox"/>	To be passive	<input type="checkbox"/>	To be assertive	<input type="checkbox"/>
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Why?



Thank you
You are a star!



LIFE EDUCATION CENTRE

Please note that this questionnaire is anonymous and confidential



Date today: _____ School: _____

Are you: Male? Female? How many children do you have at this school? _____

How old are you? under 20 20-29 years 30-39 years 40 or over

Did you feel welcomed into the school today? Very welcome welcome Not welcomed

For each of the topics discussed today please tick box showing if it was useful for you:

	Not useful	Moderately useful	Very useful
Acting as a role model for your child	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How to protect your child from taking risks eg misusing drugs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assertive behaviour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drugs information/quiz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Active Listening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Praise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Open questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

We really want to know what you think about this Life Education workshop. Please tell us here:

Please provide the first 4 digits of your postcode: ____ ____ ____ ____
(We will not use this to contact you)

Thank you for taking the time to complete these questions, please fold this questionnaire

Life Education Centres Evaluation Questionnaire for Teachers



School _____

Date _____

Name _____

1 Have you visited a Life Education Centre before? Yes No

2. Please rate the following items assessing Life Education Centres by circling one number per item:

	Poor	Below Average	Average	Good	Excellent
Educator's teaching style	1	2	3	4	5
Children's understanding of concepts	1	2	3	4	5
Suitability to the needs/interests of children	1	2	3	4	5
Programme's impact on children	1	2	3	4	5
Programme's impact in school	1	2	3	4	5
Programme content	1	2	3	4	5
Programme presentation	1	2	3	4	5
Overall evaluation of the programme	1	2	3	4	5

3 Does Life Education Centres' programme complement your curriculum and approach in the classroom?

- Does not complement at all.
- Does complement in some ways.
- Does complement very well
- Not sure.

Please explain how it does or does not complement your curriculum/approach:

4 Did Life Education Centres' programme have an impact on children? Yes No
Please explain your response:

5. Which components of the programme had the:
a Greatest Impact on the children?

b Least Impact on children?

6. Did the children learn new things by participating in Life Education Centres?
Yes No Not Sure

What did the children:
a Learn?

b Find Confusing?

7. Would you be willing to bring your class every year?
Yes No Not Sure

Why or why not?

8. Do you see any gaps in Life Education Centres' programmes?
Yes No Not Sure

If **YES**, what gaps do you see with regard to:
Improving the Programme?

Adding New Topics/Activities?

Thank you for completing this questionnaire.

Indicator Data Table Wirral

Selecting an indicator title link from the list below will open a chart in a new window that shows the measure and rank for all North West local authorities

	Indicator	Measure North West North West			National North West North West		
		(a)	Rank (b)	Average	Average	Worst	Best
1	Stillbirths	5.30	21	5.50	5.50	7.10	2.00
2	Perinatal mortality	7.80	24	8.20	8.00	11.00	4.10
3	Infant mortality	4.90	15	5.60	5.00	9.40	2.10
4	All cause mortality - males	53.59	19	62.72	55.89	104.94	24.70
5	All cause mortality - females	37.41	11	49.24	45.63	108.46	22.96
6	Emergency hospital admission - males	9,190.34	17	9,891.03	7,361.03	13,883.30	5,797.65
7	Emergency hospital admission - females	8,364.30	25	8,556.93	6,302.44	11,764.29	4,829.53
8	Frequent fliers admissions to hospital	158.11	14	192.23	127.84	320.06	59.06
9	Hospital admission for fractures - males	602.14	18	624.74	565.37	768.69	422.18
10	Hospital admission for fractures - females	373.20	32	344.95	315.53	463.66	203.26
11	Hospital admission for asthma -males	383.52	20	423.71	279.68	798.20	114.31
12	Hospital admission for asthma - females	214.47	20	265.02	181.03	496.11	81.45
13	Hospital admission for respiratory tract infection - males	735.30	28	720.30	516.31	1,325.93	275.01
14	Hospital admission for respiratory tract infection - females	643.68	34	544.74	390.50	1,093.22	268.20
15	Hospital admission for alcohol-specific conditions - males	158.33	41	106.37	61.85	248.43	40.08
16	Hospital admission for alcohol specific conditions - females	190.49	41	130.29	78.23	277.79	47.63
17	Low birthweight	7.50	17	8.10	7.90	11.70	2.90
18	Measles incidence	35.74	30	24.48	26.95	56.22	6.45
19	Whooping cough incidence	3.48	4	3.10	4.22	41.34	1.55
20	Road traffic accident casualties	0.39	27	0.34	0.28	0.86	0.00
21	Average no. of decayed, missing or filled teeth: 5 year olds	1.64	19	2.00	1.47	3.18	0.66
22	No decayed, missing or filled teeth: 5 year olds*	58.00	18	53.00	62.00	37.00	76.00
23	Average no. of decayed, missing or filled teeth: Year 6	0.89	21	0.92	0.64	1.32	0.32
24	No decayed, missing or filled teeth: Year 6*	60.00	19	59.00	70.00	47.00	82.00
25	Conceptions	47.78	32	44.18	40.70	67.03	19.79
26	Not good health	1.39	35	1.24	1.16	1.86	0.67
27	Breastfeeding initiation*						
28	MMR vaccination - by 2nd birthday*\$	85.61	30	86.31	84.06	79.77	90.60
29	MMR vaccination - by 5th birthday (first dose)*\$	91.10	13	89.69	87.30	83.78	96.99
30	MMR vaccination - by 5th birthday (first and second dose)*\$	75.87	31	76.37	73.56	65.15	83.99

31	Whooping cough vaccination - by 1st birthday*\$	91.97	28	92.70	91.42	85.02	97.26
32	Whooping cough vaccination - by 5th birthday*\$	93.34	37	94.45	93.23	90.01	97.16
33	Obese children: Reception males	10.06	20	10.64	10.40	15.44	5.95
34	Obese children: Reception females	9.01	21	9.32	8.83	11.85	5.27
35	Obese children: Year 6 males	20.43	27	19.82	19.98	25.81	12.55
36	Obese children: Year 6 females	17.80	32	16.79	16.55	22.77	12.06
37	Income deprivation affecting children	29.99	37	25.33	21.34	46.16	7.17
38	Dependent on key benefits	23.40	32	22.00	19.20	40.20	5.40
39	Lone parents with dependent children	33.10	38	29.00	25.20	46.80	16.00
40	Special educational needs (statements) - primary schools#	1.10	8	1.50	1.40	2.20	0.50
41	Special educational needs (statements) - secondary schools#	2.20	18	2.20	2.00	3.80	1.10
42	Absence - primary schools	5.27	35	5.13	5.18	6.11	4.29
43	Authorised absence - secondary schools	6.74	33	6.45	6.36	7.66	5.83
44	Unauthorised absence - secondary schools	1.08	4	1.60	1.50	3.24	0.86
45	Fixed period exclusions - secondary schools#	9.45	8	11.08	10.83	17.75	4.96
46	Permanent exclusions - secondary schools#	0.17	13	0.24	0.22	0.64	0.00
47	GCSE achievement*	65.80	26	65.20	64.80	46.90	79.10
48	Child Protection Plan subjects#	24.00	9	33.00	31.00	69.00	17.00
49	Children looked after#	89.00	39	69.00	54.00	151.00	39.00
50	Children in the same placement for 2 years or placed for adoption*#	52.00	2	66.00	67.00	50.00	75.00

Annex

Table A. Within school results for all four experimental schools (YR3) showing pre versus post LEC session results.

	Question 1
School A	$t(26) = 2.842, p = .009$
School B	$t(60) = 2.789, p = .007$
School C	
School D	
	Question 3 (exercise)
School A	$t(26) = 2.431, p = .022$
School B	
School C	
School D	
	Question 4 (dangerous)
School A	$t(26) = 2.126, p = .043$
School B	
School C	
School D	
	Question 5 (Liver)
School A	$t(26) = 4.914, p = .000$
School B	$t(60) = 4.464, p = .000$
School C	$t(37) = 3.389, p = .002$
School D	$t(31) = -2.239, p = .032$
	Question 5 (Heart)
School A	$t(26) = -3.911, p = .001$
School B	$t(60) = -3.763, p = .000$
School C	
School D	
	Question 6
School A	$t(26) = 3.309, p = .003$
School B	
School C	$t(37) = 2.927, p = .006$
School D	
	Question 8
School A	$t(26) = 5.792, p = .000$
School B	$t(60) = 2.198, p = .032$
School C	$t(37) = 5.187, p = .000$
School D	
	Question 9 (salmon)
School A	
School B	$t(60) = 2.186, p = .033$
School C	
School D	

Table B. Within school results for all four experimental schools (YR5) showing pre versus post LEC session results.

	Question 3
School A	$t(29) = 3.071, p = .005$
School B	
School C	$t(25) = 3.734, p = .001$
School D	
	Question 4
School A	
School B	
School C	$t(25) = 2.132, p = .043$
School D	$t(35) = 6.614, p = .000$
	Question 5 (sick)
School A	$t(29) = 2.112, p = .043$
School B	$t(44) = 2.602, p = .013$
School C	
School D	
	Question 6 (Liver)
School A	
School B	
School C	
School D	$t(35) = 3.162, p = .003$
	Question 6 (Heart)
School A	$t(29) = 2.262, p = .031$
School B	
School C	
School D	
	Question 8
School A	$t(29) = 3.808, p = .001$
School B	
School C	$t(25) = 2.440, p = .022$
School D	
	Question 9
School A	$t(29) = 3.247, p = .003$
School B	$t(44) = 2.449, p = .018$
School C	$t(25) = 4.372, p = .000$
School D	$t(35) = 3.000, p = .005$
	Question 10
School A	$t(29) = 2.408, p = .023$
School B	$t(44) = 2.934, p = .005$
School C	$t(25) = 3.434, p = .002$
School D	$t(35) = 3.494, p = .001$

Differences between YR3 and YR5

Y3 pre Vs Y5 pre

- What are the five things that everyone needs to stay alive?
Oxygen, $t(211.550) = 2.286$, $p = .023$ with YR5 pupils having greater baseline knowledge.
Exercise, $t(261.148) = 4.746$, $p = .000$ with YR5 pupils having greater baseline knowledge.
Sleep, $t(277.884) = 2.107$, $p = .036$ with YR5 pupils having greater baseline knowledge.
- How many fruit and vegetable portions should people eat every day?
Five, $t(239.482) = 3.379$, $p = .001$ with a larger percentage of YR5 pupils knowing the correct answer.
- What parts of the body are most affected by drinking too much alcohol?
Liver, $t(296.368) = 4.638$, $p = .000$ with a larger percentage of YR5 pupils identifying the correct body part.
- How many hours sleep should you have every night?
10-12 hours, $t(296.396) = 3.165$, $p = .002$ with a higher percentage of YR5 pupils answering the answer correctly.
- How much exercise should you do every day?
60 minutes, $t(286.647) = 5.804$, $p = .000$ with more YR5 pupils answering correctly.

Y3 post Vs Y5 post

- What are the five things that everyone needs to stay alive?
Exercise, $t(243.572) = 4.557$, $p = .000$ with YR5 pupils answering a higher percentage correct.
Sleep, $t(193.578) = 3.398$, $p = .001$ with YR5 pupils having greater post LEC session knowledge.
- How many fruit and vegetable portions should people eat every day?
Five, $t(248.889) = 3.030$, $p = .003$ with a higher percentage of YR5 pupils answering the answer correctly.
- What happens when people drink alcohol?
Forget, $t(287.787) = 3.100$, $p = .002$ with a larger percentage of YR5 pupils knowing the correct answer.
- What parts of the body are most affected by drinking too much alcohol?
Heart, $t(294.130) = 3.549$, $p = .000$ with more YR5 pupils answering correctly.
Liver, $t(294.997) = 2.302$, $p = .022$ with a larger percentage of YR5 pupils identifying the correct body part.
- How many hours sleep should you have every night?
10-12 hours, $t(294.712) = 2.746$, $p = .006$ with YR5 pupils having greater post LEC session knowledge.
- How much exercise should you do every day?
60 minutes, $t(261.456) = 6.575$, $p = .000$ with a larger percentage of YR5 pupils knowing the correct answer.

Y3 post Vs Y5 pre

- What are the five things that everyone needs to stay alive?
Food, $t(160) = 2.019, p = .045$
Exercise, $t(274.522) = 3.566, p = .000$

- How many fruit and vegetable portions should people eat every day?
Five, $t(247.337) = 3.055, p = .002$ showing that a higher percentage of YR5 pupils before the session than YR3 pupils after the session knew that five fruit and vegetables should be eaten every day.

Table C. T-test results of year 3 control school data against pre and post Life Education session.

	Pre LEC session	Post LEC session
Question 1		
Control		$t(52.146) = 3.676, p = .001$
Question 2		
Control		
Question 3 (Air)		
Control		
Question 3 (Drink)		
Control		
Question 3 (Sleep)		
Control		
Question 3 (Food)		
Control		
Question 3 (Exercise)		
Control		
Question 4 (Dangerous)		
Control		
Question 4 (Forget)		
Control		
Question 5 (Liver)		
Control		$t(82.622) = 4.652, p = .000$
Question 5 (Heart)		
Control		$t(89.374) = -2.185, p = .031$
Question 6		
Control		
Question 7		
Control		
Question 8		
Control	$t(90.699) = -2.227, p = .028$	$t(86.170) = 3.623, p = .000$
Question 9 (Ham)		
Control		
Question 9 (Salmon)		
Control		

TableD. T-test results of year 5 control school data against pre and post Life Education session.

	Pre LEC session	Post LEC session
Question 1 (Oxygen)		
Control		
Question 1 (Drink)		
Control		
Question 1 (Sleep)		
Control		
Question 1 (Food)		
Control		
Question 1 (Exercise)		
Control		
Question 2		
Control		
Question 3		
Control		$t(69.953) = 2.660, p = .010$
Question 4		
Control		$t(58.729) = 2.008, p = .049$
Question 5 (Dangerous)		
Control	$t(138) = -3.271, p = .000$	$t(136) = -2.496 p = .014$
Question 5 (Fight)		
Control		
Question 5 (Forget)		
Control		
Question 5 (Sick)		
Control		
Question 6 (Liver)		
Control		$t(69.316) = -2.759 p = .007$
Question 6 (Heart)		
Control		$t(75.178) = -2.862 p = .005$
Question 7 (Overdose)		
Control		
Question 7 (Not needed)		
Control		
Question 7 (Adult's)		
Control		
Question 8		
Control	$t(103.379) = -2.207, p = .030$	
Question 9		
Control		$t(58.029) = 4.336 p = .000$
Question 10		
Control	$t(147.082) = -6.324, p = .000$	