

NRG Youth Dance and Health Project 2005-06

Evaluation Report



**Commissioned by the Joint Investment Fund
for the Arts in the SHIPS region**

Written by Hampshire Dance and Laban



LABAN



Jif
partnerships

Contents

	Page
1. Executive Summary	2
2. Background and Context	
2.1 Introduction	3
2.2 Project partners	3
2.3 Consultation	4
2.4 Project aims and structure	4
2.5 Rationale for research	5
3. The development of NRG	
3.1 Recruitment	6
3.2 Devising the programme content	6
3.3 Pilot session	8
4. Project delivery	
4.1 Dance sessions	9
4.2 Roadshow	10
5. Teachers' and Artists' Evaluation	
5.1 Teachers' evaluation	11
5.2 Artists' evaluation	13
6. Project research	
6.1 Research Questions	15
6.2 Physical Fitness	15
6.3 Psychological Wellbeing	17
6.4 Structure of Assessments	18
7. Research results	
7.1 Physical Fitness results	19
7.2 Psychological Wellbeing results	21
8. Summary and Implications of Project Findings	24
9. Research Considerations	25
10. Recommendations for the Future	26
Appendices	
1. Detailed Methodology	27
2. Additional Test Information	29
3. References	34
4. Contacts	36
5. Acknowledgements	37

Note: The research findings are available as a separate document. The content of the creative dance programme is available as a CD Rom, *NRG: Be healthy through dance*.

I. EXECUTIVE SUMMARY

A project of this kind has never before been undertaken in the UK. It is therefore pioneering and forward thinking in determining, through scientific methodology, the extent to which creative dance affects physiological and psychological wellbeing among young adolescents.

In September 2004, the Joint Investment Fund (JIF) for the Arts in the SHIPS region (Southampton, Hampshire, Portsmouth and the Isle of Wight) commissioned Hampshire Dance and Laban to develop a youth dance and health project. The aim of the project was to scientifically investigate the impact of dance on young peoples' health and wellbeing.

The project was devised with the aim of assessing the effects of a creative dance programme on the physiological and psychological health and fitness characteristics of school children aged 11-14 years old in the SHIPS region. It was undertaken between October 2005 and March 2006, and involved 348 young people in nine schools across seven local authority and unitary districts. To coincide with the school term timetable, the project was delivered as a ten-week programme.

The programme of dance sessions had a strong focus on creativity so as to educate and inspire young people, and to provide an opportunity for them to experience and enjoy dance as both a creative art form and a physical activity.

Data was collected at the beginning and end of the ten weeks to determine the physical and psychological adaptations that may have occurred. Areas of assessment were lung capacity, flexibility, aerobic capacity, self-esteem, intrinsic motivation and attitude towards dance as a physical activity.

In brief, the research demonstrated that physical fitness increased in all three areas assessed (lung capacity, flexibility and aerobic capacity). This increase was statistically significant among the females. With regards to psychological wellbeing, results found positive adaptations in all areas assessed (self-esteem, intrinsic motivation and attitude towards dance) although these were not statistically significant.

The project was successful in providing robust evidence for the benefits of dance, so that it can be acknowledged alongside sport. The significance of the findings warrants dissemination amongst the dance, health and sports sectors and further supports the increasing profile of dance at government level and its inclusion in strategic planning.

2. BACKGROUND AND CONTEXT

2.1 INTRODUCTION

NRG was conceived as a dance and health project for young people. It aimed to increase awareness and knowledge of the health benefits of dance, whilst scientifically assessing the effects of participation on physiological and psychological health and wellbeing.

The project arose in response to two key factors. The first of these was the growing concern around rising levels of obesity in young people expressed in the government White Paper 'Choosing Health'¹ that sought to prioritise the importance of increasing levels of physical activity for young people.

The second factor was the need for robust evidence to support the case for investment in dance. Anecdotally the benefits of dance are well known, particularly among dance teachers and practitioners. Previous research, particularly in sport, suggests that involvement in physical activity can have a positive effects on physical fitness^{2,3} and general psychological wellbeing.⁴ Therefore the research aim of the *NRG* project was to assess the physiological and psychological effects of dance as a physical activity, in particular creative dance, in an adolescent population.

Most importantly, the project provided an opportunity for participants to experience and enjoy dance as both a creative art form and a physical activity, whilst potentially impacting positively on their health and wellbeing.

2.2 PROJECT PARTNERS

The Joint Investment Fund for the Arts in the SHIPS region (Southampton, Hampshire, IOW and Portsmouth) had formed a group of seven local authority Arts Officers who were partners in a two-year dance development programme within the sub-region. The group recognised the unique contribution dance can make and is making to the health agenda, and were keen to invest in a project for young people (from 11 years upwards) which would have far-reaching impact. *NRG* was one of a series of projects developed by the group as part of this wider programme, and was the most significant in terms of monetary investment.

As the established dance agency for Hampshire, Portsmouth and Southampton, Hampshire Dance was commissioned to lead on the delivery of the dance development programme. With a strong commitment to developing dance for young people through numerous county-wide projects and with a growing interest in this specialist area of dance and health, the agency was uniquely placed with expertise and existing partnerships with the local authorities, to devise and manage the *NRG* project.

It was important to secure the involvement of a research partner from an academic institution at the project's inception. With a fast growing reputation for their pioneering work in Dance Science, Laban joined the project, enthused by its

potential. It would extend the scope of their already established dance science research in professional dance and vocational training contexts to encompass young people within educational settings, whilst also contributing to an area of research that has not yet been accessed.

2.3 CONSULTATION

Consultation meetings took place in each participating district or area between Hampshire Dance, the Arts Development Officer and a public health practitioner (Table 1). The purpose of the consultations was to ensure the aims of the project were in line with health priorities and to foster support from health partners so the project could form part of their targets. It was also important to stimulate partnerships between the local arts and health practitioners within each area, to ensure a sense of being ‘joined up’ in signposting young people onto other dance and physical activity opportunities beyond the project.

Table 1 – Practitioners involved in consultation meetings within each area

District/Area	Health Practitioner	Organisation
Eastleigh Test Valley	Healthy Living Network Coordinator	Eastleigh & Test Valley South Primary Care Trust and Eastleigh Borough Council
Winchester	Sports Development Officer	Winchester City Council
	Health Promotions Specialist	Mid Hampshire Primary Care Trust
Basingstoke & Deane	Public Health Specialist	North Hampshire Primary Care Trust
Isle of Wight	Physical Activity Coordinator	Isle of Wight Council
Portsmouth	Health Development Officer	Portsmouth City Council
Havant	Walking to Health Coordinator	East Hampshire Primary Care Trust

2.4 PROJECT AIMS AND STRUCTURE

Project aims were agreed and shared with partners.

The aims, specifically relating to what would be achieved with the young people taking part in the project, were to:

- Assess and improve young peoples’ levels of physical fitness
- Assess and improve young peoples’ mental health and wellbeing
- Develop understanding of the positive impact exercise can have on bodies and minds
- Assess and improve attitudes and motivation towards dance and physical activity in general
- Inspire young people to pursue and increase levels of involvement in dance and/or other forms of physical activity

These sat within wider overarching aspirations for the project as a whole, which were to:

- Build partnerships with local arts and health providers in order to improve access young people have to information about dance and physical activities in their locality
- Scientifically assess the impact of participation in the programme on young peoples' physiological and psychological health, and disseminate this information widely to the dance, health, sports and other related sectors.

The project was structured into a 10-week programme to provide sufficient time for an impact to be made on the young people participating, whilst also fitting comfortably into the school timetable. The opportunity to spread the project over two terms also allowed a large amount of young people to take part, resulting in a research sample that was representative of the larger youth population.

2.5 RATIONALE FOR RESEARCH

Dance is known to provide a means of expression and communication; 'Creating dance provides people with the opportunity to make individual responses to their world' and '...because of its expressive and creative nature [dance] stands apart from other physical activities.'⁵ As such dance is acknowledged as being instrumental in developing young people's creative and artistic, personal and social skills. Moreover, as a physical activity, dance may also impact positively on fitness, health and wellbeing.

Much research in sport suggests that physical activity can have a positive effect on physical fitness^{2,3} and general psychological well-being.⁴ For example, studies have shown that physical activity increases lung function,^{6,7} flexibility,⁸ and aerobic capacity.⁹ In addition, various psychological benefits, such as self-esteem, have also been enhanced.¹⁰ It is interesting to note that in general, adolescent females' involvement in physical activity is less than that of adolescent males. Furthermore female involvement decreases from adolescence onwards.^{11,12,13}

As a result of the recent UK government level health initiatives to encourage more children to participate in physical activities, dance is increasingly on the agenda as a way of enhancing physical and psychological wellbeing. While the benefits of sports activities are well documented, the potential benefits of dance in this regard are less well known. Although dance educators are aware of the possible benefits, much of this knowledge is anecdotal rather than evidence based. There is, therefore, an increasing demand from dance providers for evidence relating to the potential physiological and/or psychological benefits of dance. The research element of this project intended to provide some such evidence

3. THE DEVELOPMENT OF NRG

3.1 RECRUITMENT

It was important to target young people who may not normally choose to participate in dance, and it was anticipated that open access classes would have attracted only those with an interest in, or those already participating in dance. In order to ensure a cross-section of young people participated in the project, the decision was made to work within the school curriculum. *NRG* also had potential to create cross-curricular links with Science, Personal, Social and Health Education (PSHE) and Physical Education (PE), and therefore sat well within schools' agendas.

Each participating area was to have the project delivered to either two separate schools, or two groups within one school. Where possible schools where health inequalities existed were targeted. Arts Officers undertook their own selection process, some offering it to all schools and others approaching specific schools. The participating schools then selected class groups who may have an interest in dance but were not committed to GCSE level dance, and would potentially get the most benefit from taking part in the project.

The following guidelines were agreed from consultations that took place between Hampshire Dance and participating schools:

- Participants to be from a Key Stage 3 year group
- Participants to be of mixed abilities and gender
- Groups to include a range of participants who may not normally opt to take part in dance
- Maximum number of 30 in a group
- Group to be made up of the same participants for the whole ten weeks
- Attendance registers to be taken at each session and kept by the school
- A qualified teacher to be present at all times during sessions and able to assist with behaviour
- Each session to allow for at least one-hour delivery time, excluding time for changing
- Consent for groups to participate in the research required from the school or if deemed necessary, individual parental consent to be sought

3.2 DEVSING THE PROGRAMME CONTENT

A team of freelance artists with a range of dance training and backgrounds was recruited to lead the project. During a three-day training period, they worked together to devise the content of the dance programme. Acknowledging the benefits of a creative approach in developing young peoples' expressive and artistic skills in dance⁵, the team decided the programme should have a primarily creative content. The term 'creative dance' is used in this report to refer to this creative approach. Aspects of the dance sessions incorporated recognisable 'contemporary' or 'street dance' styles, however the main focus of the sessions was on the young

people creating dance movements and phrases based on the themes that were presented by the dance artist.

Each session would be structured to contain the following components:

- Warm-up
- Cardiovascular (CV) sequence
- Creative development
- Cool down

Artists devised examples of warm-ups and CV sequences to enable them to gain a shared understanding of how the programme would be delivered. It was necessary to allow for flexibility in the preferred dance style of the artist and the group, as some may have chosen to work in a contemporary style and others in a street/hip hop style.

Creative dance ideas were developed around four themes relating to the body, and relevant to the Key Stage 3 Science curriculum:

- The Heart
- The Lungs
- Muscles and Bones
- Nutrition

Each artist developed creative dance ideas around a theme, which they taught to one another and refined as a group.

Research took place into the appropriate health messages and background information on the themes, which the artists would communicate within the sessions. This information, along with the creative dance tasks, was compiled into a project resource for the artists.

Home Economist, Rosemary Blackmore from Portsmouth City Council led a session as part of the training on nutrition and the messages appropriate to young people, as this was a topic where the artists felt they required more in-depth knowledge.

Project researchers from Laban attended the training to discuss with the artists the nature of the testing they planned to undertake, and how the programme would be structured to integrate the research components. It was important that the nature of the testing and methods of data collection were appropriate and accessible for the young people, and were integrated well into the programme.

Consistency in delivery across sessions was important where possible, to create optimum conditions for the research. However, it was important to recognise that this needed to be balanced with the needs of the young people taking part and of the artists leading the programme. Artists required a degree of freedom to respond to individual groups, and not always be restricted by a set structure. The primary aim was to ensure that young people at all levels of ability engaged with the project

as fully as they were able to, and through participation were inspired and motivated to become involved in dance activity.

3.2 PILOT SESSION

A pilot session with a year 8 group from Wildern School in Hedge End, near Southampton enabled the artists to try out a number of the ideas they had developed. This presented the opportunity for feedback from both the participating group and amongst the artists themselves.

Feedback from the young people in the pilot group was very positive. Comments included:

'We learnt about the lungs through dance. I wish we could do that in science.'

'Today was fantastic fun and I've learnt lots of new things, and I'll never forget it'

Some of the young people found the sustained amount of exercise challenging. This reaffirmed the need for sessions to be tailored specifically to the needs of each group, as opposed to expecting each group to work at a pre-defined level. The key was to see an improvement from the baseline data, which would be gathered at the start of the programme. It was also recognised that over the course of the ten weeks the warm-up and CV sequence would increase in pace as the fitness and stamina of the young people developed.

4. PROJECT DELIVERY

4.1 DANCE SESSIONS

In order to ensure the research was representative of the larger youth population, a high number of young people were required to participate in the programme. With seven local authority partners, scheduling was therefore complex and needed to occur over two phases; October - December 2005 and January - March 2006.

Table 2 – Timetable and numbers participating

District/Area	School	Groups	Numbers	Term	Session Length
Eastleigh	Thornden School	2	50	Spring	1 hour 20 minutes
Test Valley	The Mountbatten School	1	22	Spring	1 hour
	Test Valley School	2	26+27	Spring	1 hour
Winchester	Kings School	1	27	Spring	1 hour 10 minutes
Basingstoke & Deane	Fort Hill Community School	1	28	Autumn	1 hour
	Aldworth Science College	1	21	Spring	1 hour 20 minutes
Isle of Wight	Bishop Lovett CE Middle School	1 Autumn 1 Spring	24 26	Autumn + Spring	1 hour 30 minutes
Havant	Park Community School	1	27	Spring	1 hour 10 minutes
Portsmouth	Admiral Lord Nelson School *	2	24+22	Spring	1 hour 20 minutes
	St Luke's CE Secondary School **	1	24	Autumn	1 hour

*Due to timetabling restraints Admiral Lord Nelson School groups only took part in a 6-week programme. Young people undertook psychological questionnaires, but no physiological testing.

**St. Luke's School did not complete the programme.

Table 3 – Structure of dance activity and testing throughout the 10 week programme

Weeks	Activity
1	Research assessments
2	Creative dance class and one research questionnaire
3-8	Creative dance class
9	Creative dance class and one research questionnaire
10	Research assessments

During weeks 2-9, each dance session followed the structure as outlined in Section 3.2. Artists based the creative development section of each session around one of the four chosen themes. Through creative and choreographic tasks the groups explored themes such as how the heart works, how the body changes during exercise and food as an energy source. This provided an opportunity for communicated through a creative and physical activity, thus playing to the strengths of kinaesthetic learners.

4.2 ROADSHOW

At the end of the programme a roadshow event, held at Thornden School, Chandlers' Ford, brought some of the groups together to share their experience of being involved in the project. Participants, their parents/guardians, local authority partners and health organisations were invited. Groups chose how they would like to present their involvement in the project, be it through dance or another medium such as writing, music or art. Some groups performed dance pieces devised around the creative themes such as the circulatory system (heart and lungs). Others performed the CV sequence they had developed within their sessions. The groups introduced their own presentations and one of the artists gave an opportunity for the audience to participate in a fun interactive movement activity based on aspects of nutrition.

Information from each local authority partner was made available, in order to motivate the young people to continue participation in dance and other activities available within their locality. In addition local organisations displayed relevant information and distributed booklets addressing health topics. The various fun, health-related activities and stands provided a relaxed environment. Amongst the activities were a fruit 'shy', DJ'ing, interactive dance mats and salsa and hip-hop dance workshops. Laban's Dance Science team set up the testing equipment to allow guests the opportunity to take part in some of the testing from the project. Healthy refreshments such as fruit and smoothies were also available.

5. TEACHERS' AND ARTISTS' EVALUATION

5.1 TEACHERS' RESPONSES

Table 6 shows the results gathered from evaluation forms returned by seven of the nine schools. Responses were recorded on a scale of one to five. One = 'not at all' Five = 'very much'

Table 4 – Results from teacher's evaluation

Question	1	2	3	4	5
How much do you feel that the young people benefited from the project physically?			5	1	1
How much do you feel that the young people benefited from the project psychologically?	1	1	3	2	
How relevant were the topics covered during the programme for the year group that participated?		1	1	4	1
How suitable was the balance between teaching the health themes and working creatively through dance?		3	1	3	
How relevant, appropriate and interesting was the testing for the pupils?		3	1	1	2
How much did the project meet your expectations?		1	2	4	
How interested would you be in including this project into your future curriculum?			5	1	1
How interested would you be in buying a CD Rom resource of the project?		1	2	3	1
How efficient did you find the administration of the project?		1	1	5	

In addition teachers' responses to certain aspects of the project are summarised below:

Most useful aspect of the project

The majority of teachers valued the opportunity of a visiting dance practitioner leading the sessions, as it provided them with new ideas and approaches to teaching dance that developed their own practice. For some, the benefit of the project lay clearly with the young people's learning, both in their increased knowledge around health, and in the development of their skills in dance through the creating and

performing of a choreographed piece. One teacher commented on the positive benefits of observing two groups respond very differently to the project. One group focussed more on the creative aspects and developing material, whilst the other group was more interested and enthused by the CV sequence.

Least useful aspect of the project

Comments were mainly around aspects relating to the delivery of the dance sessions and the research testing. One teacher felt the young people needed to work in smaller groups as they felt this would have been more productive in the sessions she had observed, whilst another commented on the themes at times being too static or slow.

A further comment questioned the inconsistency of delivery across all groups as a factor potentially affecting the outcomes. This is an aspect that was a limitation within the project, but implementing the artist training days prior to commencing the project reduced potential inconsistency.

Artists

Overall very positive feedback was received about the artists leading the project. Some teachers felt the artists built a strong rapport with the young people and were successful in inspiring and motivating them. Others commented on how the artists were energetic, hard working and well prepared. They dealt well with challenging groups of young people, maintaining their focus and attention. One expressed an interest in inviting the artist they worked with to them to lead further work in the school.

Roadshow event

The general view expressed was that the roadshow was a positive and well-organised event, which was enjoyed by all who attended. The range of interactive activities was highlighted as a positive factor contributing to the event's success. Teachers commented on the benefits of seeing the work developed by other groups. However some were disappointed that not all the participating schools attended, despite all having the opportunity to do so. A suggestion was made that the use of video during the project could have enhanced the quality of the participants' experience, and could have been used effectively within the roadshow event.

Future improvements

Teachers' recommendations for future improvements focussed on suggestions relating to the delivery of sessions. Comments received suggested having more time within the sessions dedicated to creative work and providing supplementary theory work around the health themes enabling those not able to take part actively in individual sessions to benefit from the project.

5.2 ARTISTS' RESPONSES

The following highlights the main points gathered during a facilitated feedback session with the artists after the project.

Strengths and positive outcomes

- The roadshow was a fun event giving a good sense of the scale of the project and how it had engaged the young people. It was good to see parents attending and involving themselves in the range of activities. Creating work to be performed at the roadshow seemed to encourage young people to become more involved, helping overcome any initial scepticism. Audience members appeared very interested in the impact of the project on the young people.
- It was felt that most of the groups gained a lot of knowledge from the health themes and were generally interested in the topics covered. Artists who worked with Year 7 groups particularly noted this, as they had not yet covered the relevant health and science topics within their curriculum. The young people seemed keen to learn; perhaps as they could see it would benefit them in the future.
- Some young people showed an interest in finding out about other activities happening in their locality, so that they might continue with dance and/or physical activity.
- The positive outcomes were greatest in situations where the school showed a strong sense of support for the project by working hard to incorporate it into their timetable, and making sure all the young people were clear about what they were participating in.

Weaknesses and challenges

- Several of the artists commented that there were numerous aspects and components of the project to integrate within each session and this made it a challenging project to deliver. For example, they felt they needed to ensure groups were challenged aerobically within all sessions, as well as communicating health facts and information through the material being taught.
- In addition the research testing needed to happen at the beginning (week 1) and the end (week 10) of the programme. Due to time constraints one research question had to be administered in week 2 and also repeated in week 9 of the project. Some artists felt that this distracted from the teaching on these days.
- During the recruitment of the schools, it was emphasised that the project would be of most benefit to those with little or no current experience in dance but those with an apparent interest in it. However in several instances schools responded to this by selecting a low ability group, who had little or no interest in taking part in dance. This increased the challenge for the artists working in these contexts, and meant withdrawing the project from one school. During the second phase of the project,

coordinators sought to address this by working more closely with the schools in the selection of appropriate groups to take part.

- School teachers were already using some of the research tests carried out at the beginning and the end of the programme in physical education contexts. While this was advantageous in terms of familiarity with the testing procedures, a couple of the artists felt the young people made an association with sport, and as a result they found it challenging to keep the young people focussed on dance and creativity.
- Artists felt they would have benefited from receiving a copy of the partnership agreement made between Hampshire Dance and the school, in order to clarify the responsibilities of both, and to ensure clear communication with schools when issues arose.

6. PROJECT RESEARCH

6.1 RESEARCH QUESTIONS

- Does creative dance have an effect on elements of **physical fitness** in 11-14 year old school children?
- Does creative dance have an effect on elements of **psychological wellbeing** in 11-14 year old school children?

6.2 PHYSICAL FITNESS

It is generally known that various forms of physical activity can have a positive effect on physical fitness in this age group^{2,3}. The effect of creative dance has yet to be examined.

Based on areas assessed in previous studies, the following areas of assessment were chosen for this project:

- Lung Capacity
- Flexibility
- Aerobic Capacity

Lung Capacity (or function and capacity of the lungs)

To assess lung capacity children took a big inhalation to maximally fill their lungs with air. Sealing their lips around a disposable mouthpiece the air was expelled out and down a tube into a digital measuring device, called a Lung Spirometer (LS) (Figure 1). Two readings were displayed, the first indicated power of the lungs (Forced Expiratory Volume per one second (FEV)), and the second indicated total lung capacity (Functional Vital Capacity (FVC)). Two attempts were made and the best score was recorded for analysis. The highest score represents better lung capacity.



**Figure 1 - Lung Spirometer
(Micro Medical, UK)**

Flexibility (or range of motion at a joint)

Hamstring flexibility was assessed using a Sit-and-Reach (SR) box (Figure 2). Each child sat on the floor with their legs extended and were directed to keep their knees straight and toes pointing towards the ceiling. With one hand on top of the other they reached their hands as far along the top of the box as possible. This position was held for 2-3 seconds, released and then repeated twice more. A scale (in centimetres) on the top of the box was used to record the distance reached. An average score from the three attempts was used for analysis. Once again the higher score represented farthest distance reached and therefore greater flexibility.



Figure 2 - Sit and Reach Test (SR)
(Cranlea, UK)

Aerobic Capacity (or cardiovascular endurance)

The 20-metre Shuttle Run test (Figure 3), more commonly known as a ‘bleep test’, was used to assess aerobic capacity. Many of the children were already familiar with this test as it had been used within their existing physical education programme. The students ran from point A to point B (1 shuttle) within a timeframe dictated by pre-recorded beeps on the accompanying test CD [Appendix 2]. As the test continued, the timeframe in which to complete the shuttle run decreased. Thus, the test got progressively harder the longer it continued. The test ended when the participant felt they could no longer continue, or when the researcher deemed the criteria for continuation had not been met. This test was scored by recording the total number of shuttle runs completed. A higher score represents better aerobic capacity.



Figure 3 - 20m Shuttle Run Test (SRT)
(Sports Coach UK &
University of Loughborough)

6.3 PSYCHOLOGICAL WELLBEING

There is a positive relationship between involvement in physical activity and enhanced wellbeing^{4,10}. It is felt that participation in creative dance can have positive effects on various psychological aspects of wellbeing; however this has yet to be shown scientifically.

Based on aspects of psychological wellbeing assessed in previous studies, the following areas of assessment were chosen for this project:

- Self-esteem
- Motivation
- Attitudes towards dance



Self-esteem (or self-respect; pride in oneself)

A standardised Self Esteem Scale (SES) [Appendix 2] was used to assess global self-esteem. This consisted of 10 statements, each of which required the pupil to circle one of the following responses; 'Strongly agree', 'Agree', 'Disagree', 'Strongly disagree'. The responses to each statement were calculated, in accordance with the instructions accompanying the scale. The results of each item were then summed to give a single overall figure that was representative of global self-esteem. A higher overall score signifies greater self-esteem.

Intrinsic Motivation (or participation for pleasure rather than external reward)

To assess motivation a standardised Intrinsic Motivation Inventory (IMI) [Appendix 2] was used. The inventory consisted of 18 questions relating to the dance classes. Similar to the format of the SES, each question required a response by circling one of the following; 'Strongly agree', 'Agree', 'Agree a little', 'Neither agree nor disagree', 'Disagree a little', 'Disagree', 'Strongly disagree'. Once again the responses to each statement were calculated, in accordance with the instructions accompanying the inventory. For this inventory, the responses from the 18 questions divide into 4 sub-categories that represent levels of *interest/enjoyment*, *perceived competence*, *effort/importance* and *tension/pressure*. A higher score for each sub-category signifies greater intrinsic motivation.

Attitudes towards dance

A newly devised qualitative questionnaire, that included open-ended questions, was used to assess attitudes towards dance [Appendix 2]. This gave the participants the opportunity to put their experience into their own words. Responses were then analysed as 'positive', 'negative' or 'undecided' and a percentage of each category was calculated.

6.4 Structure of Assessments

Table 5 – Outline of Assessment Structure across the 10-week programme

Weeks	Activity	Tests Administered
1	Testing only	Lung capacity, Flexibility, Aerobic capacity, Attitudes towards dance
2	Dance class and testing	Self Esteem Scale
3-8	Dance class only	None
9	Dance class and testing	Self Esteem Scale
10	Testing only	Lung capacity, Flexibility, Aerobic capacity, Attitudes towards dance, Intrinsic Motivation Inventory

7. RESEARCH RESULTS

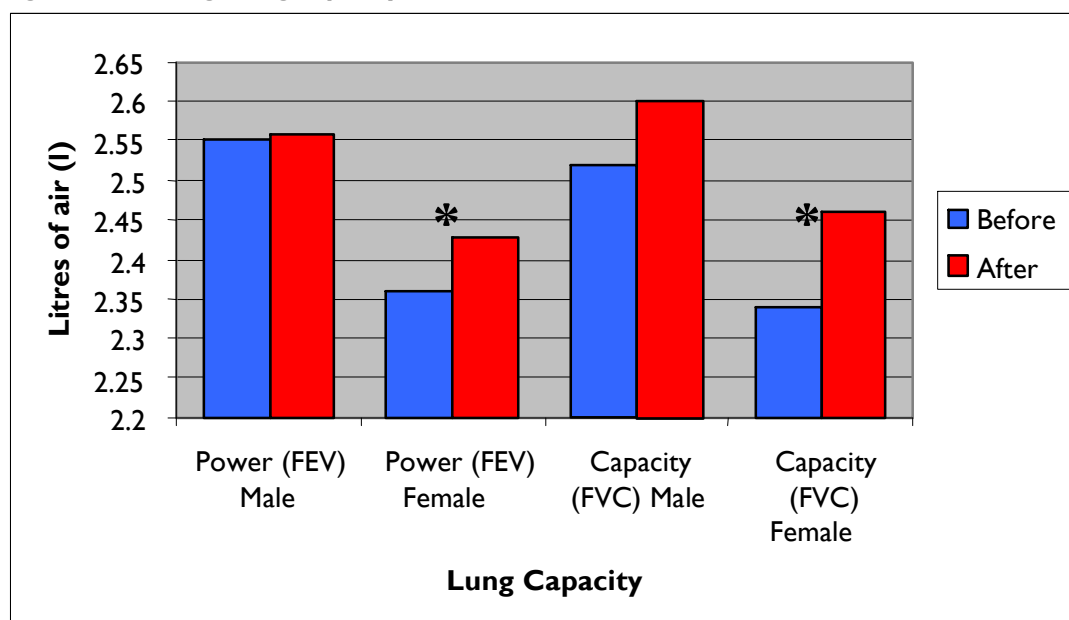
Slight alterations to testing methods occurred between the initial testing period, September – December 2005, to the final testing period, January – March 2006. Therefore the research analysis focuses primarily on the second testing period. As is common in projects with such large participation, not all registered project participants were available during all testing sessions and for one school, time constraints resulted in only partaking in psychological and not physiological testing. To get a true representation of the potential effects of full participation in the project, only individuals for which complete sets of before and after data existed were used for the scientific analysis. This amounted to 226 sets of data.

7.1 PHYSICAL FITNESS RESULTS

The degree of change in the three areas of physical fitness as a result of participation in the dance classes was statistically analysed.

Results found that creative dance increased lung capacity, flexibility and aerobic capacity
A significant increase was found among the females.

Figure 4 - Average lung capacity scores in litres for males and females

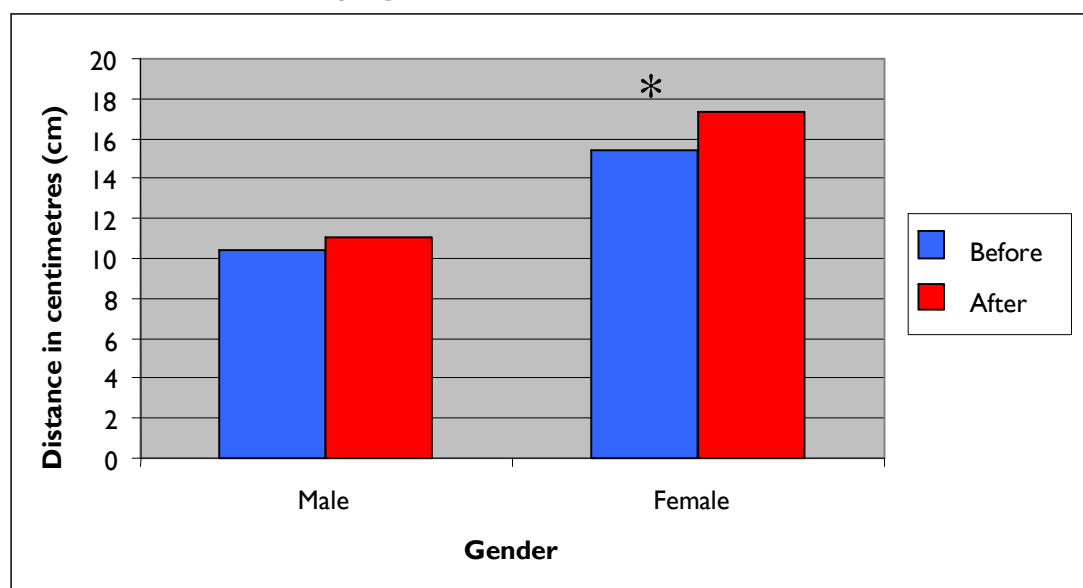


*Denotes statistical significant difference

Males and females increased their lung capacity (FEV and FVC). Due to the physiological differences between males and females¹⁴ it is natural for males to have greater lung capacities than females, (Figure 4) however only the females showed statistically significant improvements. Interestingly, average lung capacity values for

both male and female (before and after) were below the recommended values for the group's mean height, indicating potential for more improvement in both gender's lung capacity scores.

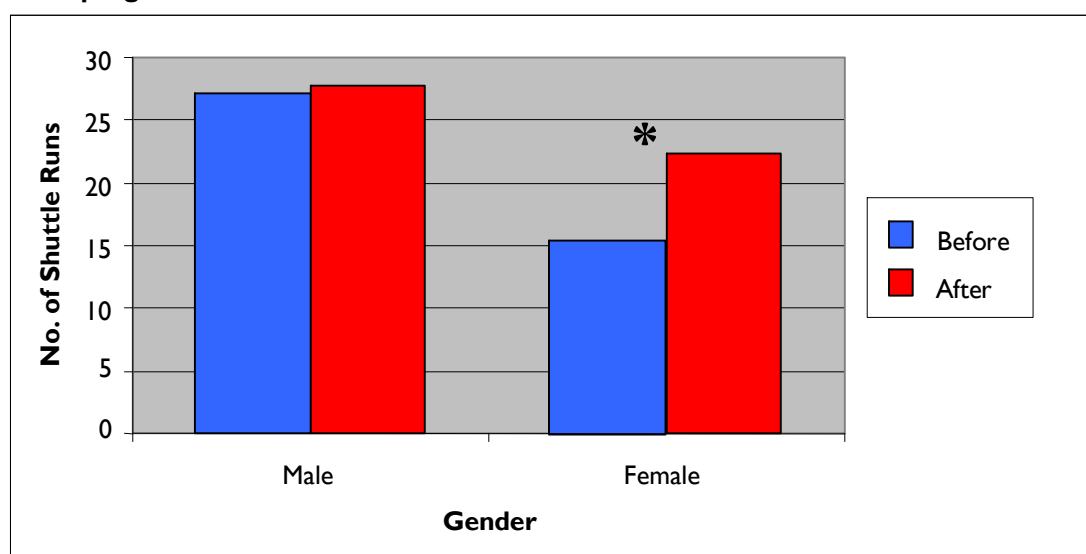
Figure 5 - Average hamstring flexibility scores in centimetres for males and females before and after the dance programme



*Denotes statistical significant difference

Females statistically improved their flexibility more than the males. Female joint range of motion and their potential for improvement is generally higher than that of males¹⁵. This has been supported with the significant female improvement even though their initial flexibility was greater than the males.

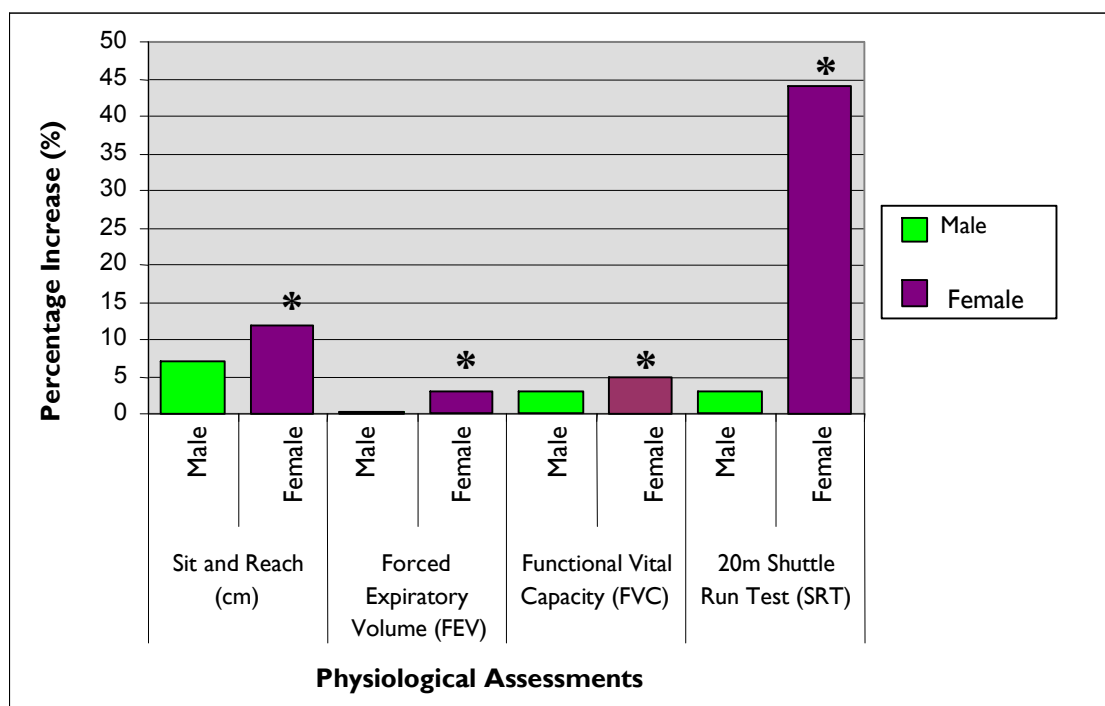
Figure 6 - Average number of shuttle runs for males and females before and after the dance programme



*Denotes statistical significant difference

Males' initial aerobic capacities were higher than the females. This supports previous literature which has stated that male adolescents are generally more active than females, and partake in activities that are more vigorous^{11,12,13}. The relatively high initial aerobic capacity for the males meant that a statistically significant improvement would require a higher intensity. The statistically significant increase in females' aerobic capacity indicates the intensity levels of the dance classes were appropriate to elicit this change.

Figure 7 - Overall percentage (%) increase in physiological areas assessed for males and females after the programme



*Denotes statistical significant difference

This graph summarises the percentage increase in each of the three areas of physical assessment. It shows that the females improved more than the males. It also shows the substantial increase in the female aerobic capacity as shown by the 20m SRT.

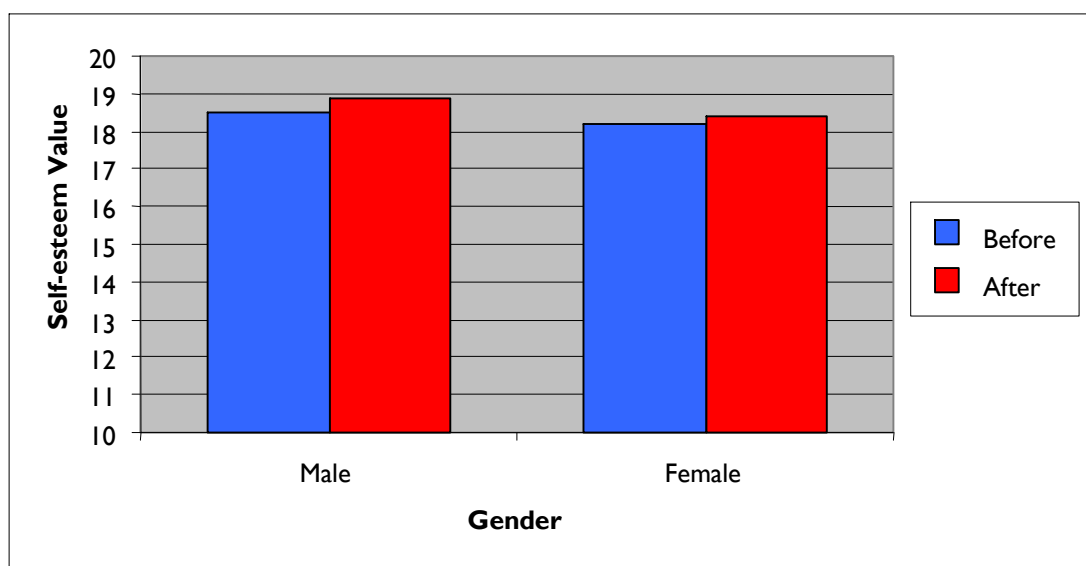
7.2 PSYCHOLOGICAL WELLBEING RESULTS

The degree of change in the three areas of psychological wellbeing as a result of participation in the dance classes was analysed qualitatively and quantitatively.

Results found that creative dance enhanced psychological wellbeing in all three areas.

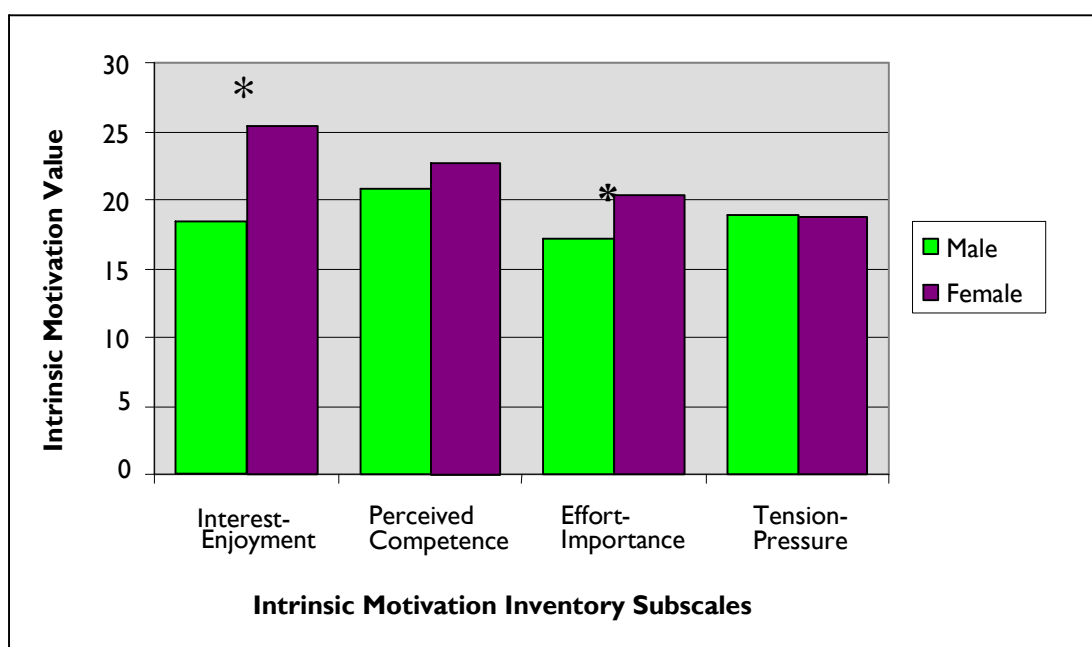
These changes were positive but statistically not significant.

Figure 8 - Average male and female scores for self-esteem before and after the dance programme.



Positive improvements in self-esteem were found in both male and female, however statistically this improvement was not significant. It is worth noting that the SES is a global measurement of self-esteem, and not dance or activity specific.

Figure 9 - Average scores for male and female Intrinsic Motivation Inventory after dance programme

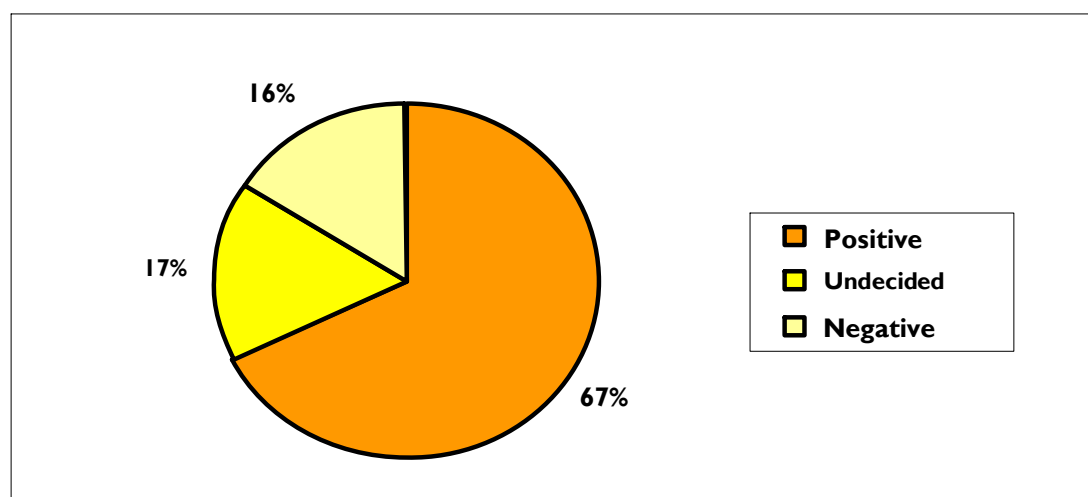


*Denotes statistical significant difference

According to the IMI completed at the end of the dance programme, males and females experienced different levels of motivation. Females experienced significantly higher levels of interest-enjoyment and effort-importance than the males. Females

also had a higher perceived competence level although this was not significant. Males and females experienced similar levels of tension-pressure. This would indicate that females had a greater overall motivation to take part in the dance programme, which is consistent with previous literature assessing gender differences in motivation in relation to gender stereotyped activities^{16,17}. These motivational differences could also explain why the females showed a significant improvement in all of the physical areas of assessment.

Figure 10 - Overall attitudes towards dance after the dance programme



Based on responses to the qualitative questionnaire, over two-thirds of the group reported positively to the open questions about attitudes towards the dance programme. Consistent with the majority of other areas assessed, the females responded more positively than the males. Despite this, the overall majority reported the dance programme as being fun, exciting and enjoyable. For example one participant commented:

“I’m now fitter and healthier. I thought it would be boring but it was a lot of fun. I would want to do it again.”

8. SUMMARY AND IMPLICATIONS OF PROJECT FINDINGS

**Overall the dance programme had a positive effect on both physical fitness and psychological wellbeing.
These findings support what is known anecdotally amongst dance practitioners and scientifically validate the potential health benefits of dance.**

Creative dance is shown to be an activity that has potential to increase the health status of this age group by eliciting positive changes in certain aspects of physical fitness and psychological wellbeing. Therefore creative dance not only aids personal development but is also an activity that adolescents can be involved in for health and fitness purposes.

- **Creative dance can be considered a valid alternative to sport for eliciting certain health and fitness benefits.**

Statistical analysis shows that, in this case, females benefited physiologically more than males from this form of physical activity. Females also had overall greater motivation in comparison to males. This suggests that creative dance is particularly beneficial for female adolescents.

- **Females who 'drop-out' of most other physical activities at this age could be more inclined to engage in dance and/or creative dance if available to them.**

Psychologically, although not significant, the positive responses in the wellbeing assessments suggest that a dance programme such as this has the potential to elicit positive effects on self-esteem, motivation and attitudes towards dance as a form of physical activity.

- **Creative dance can enhance psychological wellbeing.**

Previous studies have shown that those who are involved in physical activity in their youth will carry that involvement through to adulthood^{18,19}, thus reducing risks of heart disease and other health related problems.

- **Involvement in dance during adolescence could increase involvement in physical activity in later life, thereby reducing health risks.**

9. RESEARCH CONSIDERATIONS

This project did not have a control group. Although discussions were conducted about the additional validity a control group would provide, the feasibility of accessing a control group that was at least one-third of the participating group was not possible on this occasion.

- **Future projects could include a control group in order to further validate the changes that occur.**

The impact of involvement in activities external to the programme was monitored within the open-ended questionnaire that enquired about attitudes towards dance however this information was not consistent enough to form part of the analysis.

- **Consideration could also be given to a more accurate method of recording the young people's involvement in activities external to the *NRG* programme.**

Unlike the other tests, the Self Esteem Scale (SES) was administered by the dance artists instead of the primary researcher. This was due to time constraints in weeks 1 and 10. In some cases tests were not re-administered in week 9 as scheduled. As a result these groups completed their second SES after the 20m Shuttle Run Test, in week 10, which may have affected responses.

- **The importance of consistency in the scheduling of completion of questionnaires should be adhered to.**

10. RECOMMENDATIONS FOR THE FUTURE

NRG was piloted in the Hampshire region and there is potential for it to be replicated in other locations. The content of the dance programme can be adapted for use with other groups of young people, including those of primary school age, as a means of engaging them in dance and having an impact on their health and wellbeing.

- **A CD Rom, 'NRG: Be healthy through dance' has been devised to provide guidance on the tasks covered within the programme, and acts as an interactive guide for teachers and group leaders to support delivery. Whilst aimed at 11-14 year olds (Key Stage 3) the tasks could be adapted for other age groups and varying ability levels.**

NRG is designed to exist as a stand-alone dance programme and can therefore be carried out without the research element. However, if further research into the impact of participation in creative dance is required, the research component could be included.

- **If considering repeating or developing the research aspect of the project, then engaging a partner with expertise in this field is essential. Dialogue and discussion with those leading the research is vital in preparation to decide upon the most effective way to administer tests, and to ensure shared expectations and ownership of both the delivery and research components.**
- **If not repeating the full research aspect of the project, simple tests could still be included so that the young people could experience the measured benefits and improvements made through the dance classes.**

NRG was successful in providing robust evidence for the benefits of dance, which can be acknowledged alongside sport and included in strategic plans. The significance of the findings warrants dissemination amongst the dance, health and sport sectors and further supports the increasing profile of dance at government level.

- **An advocacy document highlighting key findings will be distributed, the report will be available electronically and opportunities will be sought to present the project at key conferences and events. The project has already been presented at the International Association of Dance and Medical Science (IADMS) conference in October 2006 and the National Dance Teachers Association (NDTA) conference in November 2006. This demonstrates the interest of those working in the fields of dance education and dance science.**

Appendix I: Detailed Methodology

Participants

A sample of 348 adolescents from 9 schools within 7 local authorities in the SHIPS region (Southampton, Hampshire, Isle of Wight and Portsmouth) participated in the dance programme. Only complete data sets were used for analysis, leaving 226 research participants. Participants' gender, age and height were recorded and are outlined below (Table A1).

Table A1. Participant Characteristics

	Participants (N)	Age (yr)		Height (m)	
		Mean	SD	Mean	SD
Male	68	13	±0.87	1.58	±0.11
Female	158	13	±0.73	1.59	±0.07
ALL	226	13	±0.77	1.59	±0.08

SD = Standard deviation

Data collection

Schools were advised to ensure participants were in appropriate attire, such as gym/dance clothes and trainers.

Pre-test structure

A register of names for each participating group was provided before testing. The researcher used these names to pre-prepare individual record sheets for each participant's data. Upon arrival in the testing hall the researchers and dance artists were introduced and the procedure for the day was explained.

- The class was immediately divided into 2 even groups. Where possible these groups were the same gender.
- Group A went to Station 1 to have height and lung capacity measured, while group B completed the Sit and Reach test (SR) at Station 2. Each participant was measured individually. Once all group A and B were measured, the groups swapped stations.
- While the individual participants were waiting in their groups to be tested, they were given an information sheet that outlined the project and explained each test. They also completed the newly devised open-ended questionnaire
- Upon completion of this section of testing the rules and protocol for the 20m Shuttle Run Test (SRT) were explained to both groups.

- Upon completion of the 20m SRT the dance artist led the group through a 10-20mins movement and cool-down session with the entire group.
- The Self Esteem Scale (SES), administered in week 2, was completed at the end of the dance class under the guidance of the dance artist who had clear instructions provided by the researcher.

Upon returning to the research lab all data from the individual record sheets were inputted to Microsoft Excel and SPSS (Statistical Package for Social Science) files for later analysis.

Post-test structure

This followed the same structure as the pre-testing. The additional Intrinsic Motivation Inventory (IMI) was completed along with the post-version of the newly devised open-ended questionnaire while awaiting measurement for Stations 1 and 2. The SES was to be administered in week 9.

Appendix 2: Additional Test Information

20m Shuttle Run test for measuring aerobic capacity

The protocol for this test followed that of the accompanying test CD (Sports Coach UK and University of Loughborough, 2002) The participants ran from point A to point B (1 shuttle) within a timeframe dictated by pre-recorded beeps on the accompanying test CD. As the test continued, the timeframe in which to complete the shuttle run decreased.

Table A1. Table outlining number of shuttles, accumulated shuttles, total distance and speed during the first six stages of the test according to the protocol used

Level	No. of 20m shuttles	Accumulated no. of shuttles	Total distance (m)	Speed (kph)
1	7	7	140	8.0
2	8	15	300	9.0
3	8	23	460	9.5
4	9	32	640	10.0
5	9	41	820	10.5
6	10	51	2000	11.0

Due to varied space limitations across the schools the 20m shuttle length was divided into 2x10m, meaning participants started and ended each run at the same line (from line A to line B = 10m. One run = A to B to A = 20m). It is understood therefore that comparisons with published results in previous literature would not be appropriate in this case. For accurate data collection a research assistant recorded the final level and run of each participant while two others observed the line A and B to ensure the protocol for reaching the lines was met. Additionally a testing assistant or dance artist ran the 20m SRT with each test group.

- Participants lined up at line A
- The test CD played a 5 second countdown followed by 3 beeps in close succession. This signified the start of the test.
- The participants travelled from line A to line B and back to line A before the next 'beep' was heard.
- Three beeps in close succession signified the start of subsequent levels, each of which required an increase in speed.

Participants were withdrawn from the test if:

- On 3 successive occasions they did not reach within 1m of line A before hearing the 'beep'
- They were consistently turning before reaching line B
- It was deemed unhealthy for them to continue
- They chose to withdraw

Appendix 2 continued

Self Esteem Scale²⁰

The scale (shown below) consists of 10 statements. Participants were required to circle one of the following responses for each statement; 'Strongly agree', 'Agree', 'Disagree', 'Strongly disagree'. The responses to each statement were calculated in accordance with the instructions accompanying the scale (responses carried numerical values of 1 – 4). The results of each item were then summed to give a single overall figure that was representative of global self-esteem.

Please read each statement in the table below. If you strongly agree with the statement circle 'strongly agree'. If you agree circle 'agree'. If you disagree circle 'disagree'. If you strongly disagree circle 'strongly disagree'. Please circle whichever answer you feel best describes your reaction to each statement.

1. On the whole I am satisfied with myself	Strongly agree	Agree	Disagree	Strongly disagree
2. At times I think I am no good at all	Strongly agree	Agree	Disagree	Strongly disagree
3. I feel that I have a number of good qualities	Strongly agree	Agree	Disagree	Strongly disagree
4. I am able to do things as well as most other people	Strongly agree	Agree	Disagree	Strongly disagree
5. I feel that I do not have much to be proud of	Strongly agree	Agree	Disagree	Strongly disagree
6. I certainly feel useless at times	Strongly agree	Agree	Disagree	Strongly disagree
7. I feel that I am a person of worth, at least on equal plane with others	Strongly agree	Agree	Disagree	Strongly disagree
8. I wish I could have more respect for myself	Strongly agree	Agree	Disagree	Strongly disagree
9. All in all, I am inclined to feel that I am a failure	Strongly agree	Agree	Disagree	Strongly disagree
10. I take a positive attitude towards myself	Strongly agree	Agree	Disagree	Strongly disagree

Appendix 2 continued

Intrinsic Motivation Inventory²¹

This inventory (shown below) consisted of 18 statements relating to the dance classes. Each statement required a response by circling one of the following; 'Strongly agree', 'Agree', 'Agree a little', 'Neither agree nor disagree', 'Disagree a little', 'Disagree', 'Strongly disagree'. The responses to each statement were calculated, in accordance with the instructions accompanying the inventory (responses carried numerical values of 1 – 7). For this inventory, the 18 statements divide into 4 sub-categories that represent levels of interest/enjoyment, perceived competence, effort/importance and tension/pressure.

Please read each sentence in the table below. Then circle your response to that sentence. Please circle whichever answer you feel best describes your reaction to each sentence. For example if you strongly agree then circle 'strongly agree'. If you strongly disagree circle 'strongly disagree' and so on. Only circle only **one** answer for each sentence.

1	I enjoyed this dance programme very much	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
2	I think I am pretty good at dance	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
3	I put a lot of effort into this dance programme	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
4	It was important to me to do well in this dance programme	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
5	I felt tense while doing the dance classes	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
6	I tried very hard while doing the dance classes	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
7	Dancing was fun	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
8	I would describe this programme as very interesting	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
9	I am satisfied with my performance in this dance programme	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree

10	I felt pressured while doing the dance classes	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
11	I was anxious while doing the dance classes	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
12	I didn't try very hard for this dance programme	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
13	While doing the dance classes I was thinking about how much I enjoyed it	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
14	After doing the dance classes for a while I felt pretty competent	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
15	I was very relaxed while doing the dance classes	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
16	I am pretty skilled at dance	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
17	This programme did not hold my attention	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree
18	I couldn't do the dance classes very well	Strongly disagree	Disagree	Disagree a little	Neither Agree nor disagree	Agree a little	Agree	Strongly Agree

Appendix 2 continued

Researcher devised open-ended qualitative questionnaire

Questions for pre-test period

1. What do you think of dancing?
2. Would you think of dancing for fun? (Please circle your answer)

Yes	No	Don't know
Reasons for your answer _____		
3. Would you think of dancing to stay fit and healthy? (Please circle your answer)

Yes	No	Don't know
Reasons for your answer _____		
4. What activities do you currently do that you think keep you fit and healthy?
5. How often do you do these activities?

Hours _____	Days _____
-------------	------------
6. What do you expect to gain from this programme?

Additional questions for post testing period

- 6a. What have you gained from this programme?
- 6b. Is this what you expected? (Please explain your answer given in 6.a.)
7. Can you tell us in a few words what you thought of the *NRG* programme?
8. Was there anything you found surprising about the *NRG* programme?

Statistical analysis

- Statistical Package for Social Sciences (SPSS) and Microsoft Excel were used for data analysis
- Statistical significance was set at $p < 0.05$
- Z tests were used to analyse pre-and post changes in whole group and gender specific data
- Cronbach alpha was used to assess reliability of the IMI. The Cronbach alpha coefficient was 0.91
- A MANOVA was used to analyse gender differences in IMI subscales
- Independent t-tests were used to measure gender differences between pre and post data
- Qualitative data was analysed in percentage

Appendix 3: References

1. Department of Health: Choosing Health: Making healthy choices easier, 2004
2. Blair SN, Cheng Y, Holder, S: Is physical activity or physical fitness more important in defining health related benefits? *Medicine and Science in Sport and Exercise* S379-398, 2001
3. Strong WB, Malina RM, Blimke CJR, Daniels SR, et. al: Evidence based physical activity for school-age youth. *Journal of Pediatrics* 146: 732-737, 2005
4. Calfas & Taylor: Effects of physical activity on psychological variables in adolescents. *Pediatric Exercise Science* 6: 406-423, 1994
5. National Dance Teachers Association (NDTA): *Maximising Opportunity, Policy Paper* 2004
6. Holmen TL, Barrett-Connor E, Clausen J, Holmen J, Bjermer L: Physical exercise, sports, and lung function in smoking verse non-smoking adolescents. *European Respiratory Journal* 19: 8-15, 2002
7. Twisk JWR, Staal BJ, Brinkman MN, Kemper HCG, van Mechelen W: Tracking of lung function parameters and the longitudinal relationship with lifestyle. *European Respiratory Journal* 12: 627-634, 1998
8. Marshall SJ, Sarkin JA, Sallis JF, McKenzie TL: Tracking of health-related fitness components in youths ages 9 to 12. *Medicine and Science in Sport and Exercise* 30(6): 910-916, 1998
9. Baquet G, Berthoin S, Gerbeaux M, Van Praagh E: High-intensity aerobic training during a 10 week one hour physical education cycle: Effects on physical fitness on adolescents aged 11 to 16. *International Journal of Sports Medicine* 22: 295-300, 2001
10. Daley AJ, Buchanan J: Aerobic dance and physical self-perceptions in female adolescents: Some implications for physical education. *Research Quarterly Exercise Sport* 70(2):196-200, 1999
11. Clippenger K: Fitness, dance, and health. *Journal of Dance Medicine & Science* 1(1): 27-29, 1997
12. Livingstone MBE: Energy expenditure and physical activity in relation to fitness in children. *Proceedings of the Nutrition Society* 53: 207-221, 1994
13. Myers L, Strickmiller P, Webber L, Brenson G: Physical and sedentary activity in school children grades 5-8: The Bogalusa heart study. *Medicine and Science in Sport Exercise* 28(7): 852-859, 1996

14. Wilmore JH, Costill DL: Growth development and the young athlete. In: Wilmore JH, Costill DL (eds): *Physiology of Sport and Exercise* (2nd ed). Champaign, IL: Human Kinetics, pp 517-543, 1999
15. Alter MJ: Modern overview of flexibility and stretching. In: Alter MJ (ed): *Science of Flexibility* (3rd ed). Champaign, IL: Human Kinetics, pp 44 & 120, 2004
16. Fairclough, S: Physical activity, perceived competence and enjoyment during high school physical education. *European Journal of Physical Education*, 8, 5-18, 2003
17. Koka A & Hein V: The impact of sports participation after school on intrinsic motivation and perceived learning environment in secondary school physical education. *Kinesiology*, 35(1), 86-93, 2003
18. Pangrazi R, Corbin C, Welk G: Physical Activity for Children and Youth. *Journal of Physical Education, Recreation and Dance*, 67(4), 38-43, 1996
19. Sallis JF, Patrick K, Long BJ: Overview of the international consensus conference on physical activity guidelines for adolescents. *Pediatric Exercise Science* 6:299-301, 1994
20. Rosenberg M: *Society and the Adolescent Self-image*. Princeton: Princeton University Press, 1965
21. McAuley E, Duncan T, Tammen, VV: Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly in Exercise and Sport* 60(1): 45-58, 1989

Appendix 5: Acknowledgements

Local Authority partners and participating schools:

Basingstoke and Deane Borough Council	Fort Hill Community School Aldworth Science College
Eastleigh Borough Council	Thornden School
Havant Borough Council	Park Community School
Isle of Wight Council	Bishop Lovett CE Middle School
Portsmouth City Council	Admiral Lord Nelson School St Luke's CE Secondary School
Test Valley Borough Council	The Mountbatten School Test Valley School
Winchester City Council	Kings' School

Freelance dance artists:

Guy Adams
Sally Beattie
Jo Cone
Detta Howe
Abi Mortimer
Lizzie Swinford
Leanne Webb
Carrie Whitaker

CD Rom filming and production:

Wildern School
Cass Productions
EG Products

Photographs

Cass Productions

© Hampshire Dance and Laban 2007